

LOCATION:

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

PUBLIC MEETING AGENDA

December 11 & 12, 2008

This facility is accessible by public transit. For transit information, call (916) 321-BUSS, website:

<http://www.sacrt.com>

(This facility is accessible to persons with disabilities.)

TO SUBMIT WRITTEN COMMENTS ON AN
AGENDA ITEM IN ADVANCE OF THE MEETING GO
TO: <http://www.arb.ca.gov/lispub/comm/bclist.php>

December 11, 2008

9:00 a.m.

Agenda Item #

- 08-10-2: CONTINUED FROM THE NOVEMBER 20 and 21, 2008 BOARD MEETING
Public Meeting to Consider Approval of Assembly Bill 32 (AB 32) Scoping Plan to Reduce Greenhouse Gas Emissions in California

In 2006, Governor Schwarzenegger signed the California Global Warming Solutions Act of 2006 (AB 32). AB 32 directs the Air Resources Board (ARB) to adopt a Scoping Plan on or before January 1, 2009, which will delineate the measures and strategies that will be used to reduce California's greenhouse gas emissions to 1990 levels by 2020. At the Board Meeting, there will be a continuation of testimony and discussion from the November Board Meeting. The Board will then consider the Proposed Scoping Plan for approval.

As indicated in the public notice for this agenda item, the Board designated last month's hearing as the main forum for hearing oral testimony on the Plan. While oral testimony will also be accepted at the December 11 hearing, the Board requests that the public not duplicate their previous comments.

Agenda item numbers 08-11-1, 08-11-3, and 08-11-4 will begin no sooner than 1:30 p.m., Thursday, December 11. Staff presentations for item numbers 08-11-3 and 08-11-4 will be combined. Public testimony for these items will also be combined and will begin immediately after the staff presentations. These items will continue on Friday morning, December 12 at 8:30 a.m.

- 08-11-1: Health Update: Lung Cancer by Occupation in the United States Trucking Industry

Staff will present a study which assesses lung cancer deaths by job type in Teamsters Union members. This analysis found an increased risk of mortality due to lung cancer among pickup and delivery drivers and combined drivers (long haul plus pickup and delivery), compared to other job categories, such as clerks and mechanics. These results are consistent with previous studies in the United States and Canada showing an increased risk of lung cancer in occupations which are likely to be associated with exposure to diesel vehicle exhaust.

08-11-3: Public Hearing to Consider Adoption of a Proposed Regulation to Reduce Emissions from In-Use On-Road Diesel Vehicles, and Amendments to the Regulations for In-Use Off-Road Vehicles, Drayage Trucks, Municipality and Utility Vehicles, Mobile Cargo Handling Equipment, Portable Engines and Equipment, Heavy Duty Engines and Vehicle Exhaust Emissions Standards and Test Procedures and Commercial Motor Vehicle Idling

Existing in-use on-road diesel vehicles are a significant contributor to the statewide emissions of the particulate matter (PM) and oxides of nitrogen (NOx) from diesel mobile sources. The proposed regulation would require existing vehicles to be upgraded or replaced to comply with specified PM and NOx emission standards. The regulation would require exhaust retrofits in 2010 and 2011, and fleet modernization would be required between 2012 and 2022. School buses are included, but would generally be required only to add exhaust retrofits and would not be required to replace engines. In addition, proposed amendments to other existing regulations are needed to ensure that these regulations and the proposed regulation work together effectively. The proposed changes to the existing regulations will also clarify their requirements, provide additional flexibility, and generally improve their enforceability.

08-11-4: Public Hearing to Consider the Adoption of a Regulation to Reduce Greenhouse Gas Emissions from Heavy Duty Vehicles

This regulation would reduce greenhouse gas emissions from heavy-duty tractors pulling 53-foot-or-longer box-type trailers on California highways. It would accomplish this goal by requiring owners of tractors and trailers to use new United States Environmental Protection Agency (US. EPA) SmartWay Certified tractors and trailers, or retrofit existing tractors with US. EPA SmartWay-approved, low-rolling resistance tires and retrofit existing 53-foot-or-longer box-type trailers with US. EPA SmartWay-approved aerodynamic technologies and low-rolling resistance tires.

December 12, 2008

8:30 a.m.

The chair will open the meeting, then adjourn for about a 30-minute break for Board members and the public to go outside and view trucks on display with SmartWay and other clean technology systems. The Board meeting will be reconvened at approximately 9:00a.m.

Agenda Item #

Continue Agenda Items 08-11-3 and 08-11-4 from December 11, 2008

08-11-2: Public Hearing to Consider a Research Proposal

"Potential Design, Implementation, and Benefits of a Feebate Program for New Passenger Vehicles in California" \$796,640.

08-11-5: Public Meeting to Present to the Board a Strategic Plan for Enforcement of Diesel Emission Control Regulations Pursuant to Assembly Bill 233 (AB 233), Jones (Chapter 592, Statutes of 2007)

AB 233, requires ARB to review its enforcement of diesel emission control regulations and develop a strategic plan for consistent, comprehensive, and fair enforcement of these regulations. AB 233 requires that the plan be developed in conjunction with local air districts and the public and be reviewed by the Board in a public hearing. ARB is required to submit this plan to the California Legislature by January 1, 2009, and every three years thereafter.

CLOSED SESSION -LITIGATION

The Board will hold a closed session, as authorized by Government Code section 11126(e), to confer with, and receive advice from, its legal counsel regarding the following pending litigation:

Central Valley Chrysler-Jeep, Inc. et al. v. Goldstene, US. Court of Appeals, Ninth Circuit, No. 08-17378 on appeal from US. District Court (E.D. Cal. - Fresno).

Fresno Dodge, Inc. et al. v. California Air Resources Board et al., Superior Court of California (Fresno County), Case No. 04CE CG03498.

General Motors Corp. et al. v. California Air Resources Board et al., Superior Court of California (Fresno County), Case No. 05CE CG02787.

State of California by and through Arnold Schwarzenegger, the California Air Resources Board, and the Attorney General v. US. Environmental Protection Agency, and Stephen L. Johnson, Administrator, US. Court of Appeals, District of Columbia Circuit, Case No. 08-1178.

Green Mountain Chrysler-Plymouth-Dodge-Jeep, et al. v. Crombie, 508 F. Supp. 2d 295, US. District Court Vermont (2007), appeal to US. Court of Appeals, Second Circuit, Nos. 07-4342-cv(L) and 07-4360-cv(CON).

Tesoro Refining and Marketing Company v. California Air Resources Board, Superior Court of California (Sacramento County), Case No. 34-2008-80000064.

OPPORTUNITY FOR MEMBERS OF THE BOARD TO COMMENT ON MATTERS OF INTEREST

Board members may identify matters they would like to have noticed for consideration at future meetings and comment on topics of interest; no formal action on these topics will be taken without further notice.

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

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

THE AGENDA ITEMS LISTED ABOVE MAY BE CONSIDERED IN A DIFFERENT ORDER AT THE BOARD MEETING. BOARD ITEMS NOTED ABOVE, WHICH ARE NOT COMPLETED ON DECEMBER 11, WILL BE HEARD ON DECEMBER 12 BEGINNING AT 8:30 A.M.

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

<http://www.arb.ca.gov/lispub/comm/bclist.php>

IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT THE CLERK OF THE BOARD:

OFFICE: (916) 322-5594 or FAX: (916) 322-3928
1001 I Street, Floor 23, Sacramento, California 95814
ARB Homepage: www.arb.ca.gov

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

- For individuals with sensory disabilities, this document and other related material can be made available in Braille, large print, audiocassette, or computer disk. For assistance, please contact ARB's Reasonable Accommodation/Disability Coordinator at (916) 323-4916 by voice, or through the California Relay Services at 711, to place your request for disability services, or go to <http://www.arb.ca.gov/html/ada/ada.htm>.
- If you are a person with limited English, and would like to request interpreter services to be available at the Board meeting, please contact ARB's Bilingual Manager at (916) 323-7053.

PUBLIC MEETING AGENDA

LOCATION:

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

INDEX

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

December 11, 2008 at 9:00 a.m.

&

December 12, 2008 at 8:30 a.m.

	<u>Pages</u>
08-10-2: Public Meeting to Consider Approval of Assembly Bill 32 (AB 32) Scoping Plan to Reduce Greenhouse Gas Emissions in California	1 -148
08-11-1 : Health Update: Lung Cancer by Occupation in the U.S. Trucking Industry	
08-11-3: Public Hearing to Consider Adoption of a Proposed Regulation to Reduce Emissions From In-Use On-Road Diesel Vehicles, and Amendments to the Regulations for In-Use off-Road Vehicles, Drayage Trucks, Municipality and Utility Vehicles, Mobile Cargo Handling Equipment, Portable Engines and Equipment, Heavy Duty Engines and Vehicle Exhaust Emissions Standards and Test Procedures and Commercial Motor Vehicle Idling	149 - 468
08-11-4: Public Hearing to Consider the Adoption of a Regulation to Reduce Greenhouse Gas Emissions from Heavy Duty Vehicles	469 -724
08-11-2: Public Hearing to Consider a Research Proposal	
08-11-5: Public Meeting to Present to the Board a Strategic Plan for Enforcement of Diesel Emission Control Regulations Pursuant to Assembly Bill (AB) 233, Jones (Chapter 592 Statutes of 2007)	

CALIFORNIA AIR RESOURCES BOARD**NOTICE OF PUBLIC MEETING TO CONSIDER APPROVAL OF AB 32 SCOPING PLAN TO REDUCE GREENHOUSE GAS EMISSIONS IN CALIFORNIA**

The Air Resources Board (ARB or the Board) will conduct a public meeting at the time and place noted below to consider the approval of the AB 32 Scoping Plan to reduce greenhouse gas emissions in California.

DATE: December 11, 2008

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., December 11, 2008 and may continue at 8:30 a.m., December 12, 2008. This item may not be considered until December 12, 2008.: Please consult the agenda for the meeting, which will be available at least 10 days before December 11, 2008, to determine the day on which this item will be considered. The AB 32 Scoping Plan will also be noticed for the Board's October 23, 2008, public meeting for ARB staff to present a brief summary and for the Board's November 20-21, 2008, public meeting. Please refer to the section below entitled "Proposed Action" for a description of how each meeting will be structured.

For individuals with sensory disabilities, this document and other related material can be made available in Braille, large print, audiocassette or computer disk. For assistance, please contact ARB's Reasonable Accommodations/Disability Coordinator at 916-323-4916 by voice or through the California Relay Services at 711, to place your request for disability services, or go to <http://www.arb.ca.gov/html/ada/ada.htm>

If you are a person with limited English and would like to request interpreter services to be available at the Board meeting, please contact ARB's Bilingual Manager at 916-323-7053.

Background

In 2006, Governor Schwarzenegger signed Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006 (Nunez, Chapter 488, Statutes of 2006). AB 32 directs the Air Resources Board to approve, on or before January 1, 2009, a Scoping Plan for achieving the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions by 2020. At the December 2008 Board Meeting, staff will present the Proposed Scoping Plan for Board consideration and approval.

ARB staff proposes a comprehensive set of actions designed to reduce overall greenhouse gas emissions in California. Reducing greenhouse gas emissions to 1990 levels requires cutting approximately 30 percent from business-as-usual emission levels projected for 2020. The recommended measures and strategies have the added benefits of improving our environment, reducing our dependence on fossil fuel, diversifying our energy sources, saving energy, and enhancing public health, while creating new jobs and enhancing the growth in California's economy.

Key elements of California's plan to reduce California's greenhouse gas emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs and building and appliance standards;
- Obtaining 33 percent of California's electricity from renewables;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long term commitment to AB 32 implementation.

Proposed Action

The Board will not take action on the Proposed Scoping Plan until the December 11-12 Board meeting. At the Board's October 23, 2008 public meeting, ARB staff will provide a brief summary of the Plan to the Board. On November 20-21, 2008, the Board will conduct a public meeting to discuss the Plan. At the December 11-12, 2008 public meeting, staff will recommend adoption of the Plan. All written comments and oral testimony provided at the October, November and December meetings will be considered as part of the December item. However, the Board intends that the November meeting will be the main forum for hearing oral testimony on the Plan, and requests the public to consider this when planning their testimony. Please consult the agendas for each meeting, which will be available at least ten days before each meeting, to determine the day on which the Plan will be discussed. The agendas for each meeting can be found at: <http://www.arb.ca.gov/board/meetings.htm>.

ARB staff has reviewed the proposed Scoping Plan and concluded that it meets the requirements of AB 32. The Scoping Plan was developed with the input from other affected State agencies, the Climate Action Team and its sub-groups, the Economic

and Technology Advancement Advisory Committee, the Environmental Justice Advisory Committee, the Market Advisory Committee, as well as other interested parties who , commented on the Plan through public workshops and the ARB website.

Economic and public health analyses are included in the Plan and its appendices. Additionally, in accordance with the California Environmental Quality Act (CEQA), an environmental impact analysis has been prepared and is provided as Appendix J in the Proposed Scoping Plan. This document has been circulated through the State Clearinghouse for agency review and comment. The Board will consider approval of the Proposed Scoping Plan and adoption of the environmental document concurrently.

Availability of Documents

ARB staff will present the Proposed Scoping Plan at the meeting. Copies of the Proposed Scoping Plan may be obtained from the Board's Public Information Office, 1001 "I" Street, First Floor, Environmental Services Center, Sacramento, CA 95814, (916) 322-2990, on or after October 15, 2008. The report may also be obtained from ARB's internet site at <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>

Interested members of the public may present comments orally or in writing at the meeting, and in writing or by electronic submission before the meeting. To be considered by the Board, written comments submitted not physically submitted at the meeting must be received **no later than 12:00 noon, Wednesday, December 10, 2008**, and, addressed to the following:

Electronic submittal: <http://www.arb.ca.gov/lispub/comm/bclist.php>

Please note: For "electronic submittal" the webpage has a link for commenting on the Proposed Scoping Plan and a separate link for commenting on the Appendix J - California Environmental Quality Act Functional Equivalent Document

**For commenting on the Proposed Scoping Plan:
The link is titled "scopingpln08".**

For commenting on Appendix J - California Environmental Quality Act Functional Equivalent Document: The link is titled "ceqa-sp08".

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

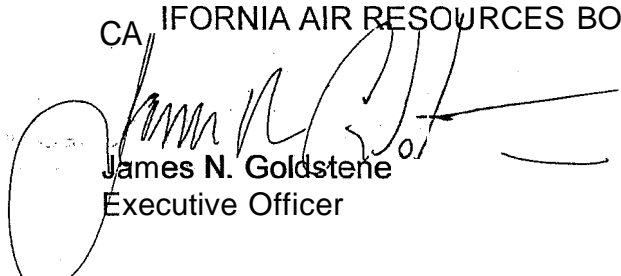
Facsimile submittal: (916) 322-3928

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request. Additionally, this information may become available via Google, Yahoo, and any other search engines.

The Board requests, but does not require, 30 copies of any written submission. The ARB also requests that written and e-mail statements be filed at least 10 days prior to the meeting so that ARB staff and Board members have time to fully consider each comment.

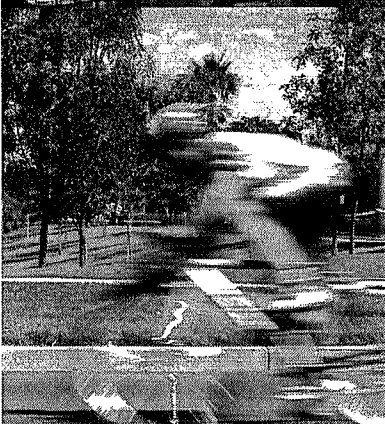
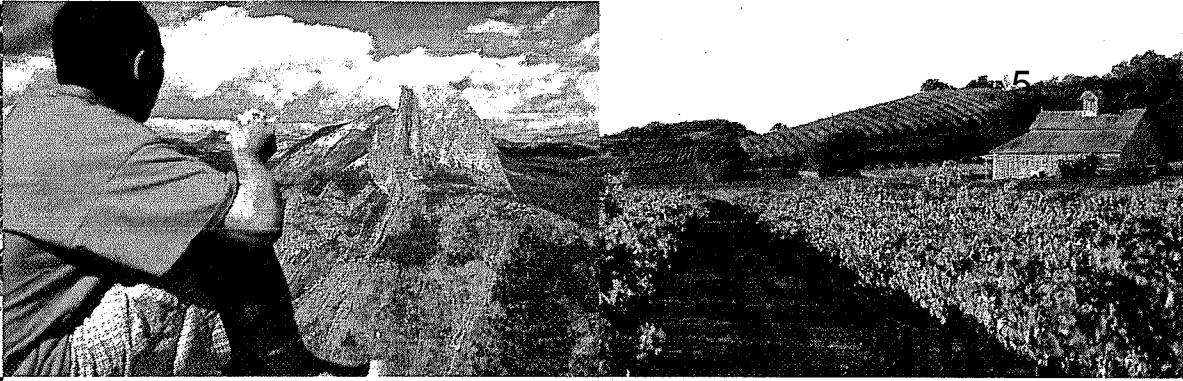
Further inquiries regarding the **Proposed Scoping Plan** should be directed to Mr. Rob DuVall at the Office of Climate Change, (916) 324-5930, 1001 I Street, Sacramento, CA95814. Inquiries and written comments regarding **Appendix J -California Environmental Quality Act Functional Equivalent Document** should be directed to Ms. Jeannie Blakeslee at the Office of Climate Change, (916) 445-8286, 1001 I Street, Sacramento, CA 95814.

CALIFORNIA AIR RESOURCES BOARD



James N. Goldstone
Executive Officer

Date: October 15, 2008



CLIMATE CHANGE PROPOSED SCOPING PLAN

a framework for change

OCTOBER 2008

Pursuant to AB 32

The California Global Warming Solutions Act of 2006

Prepared by
the California Air Resources Board
for the State of California

Arnold Schwarzenegger
Governor

Linda S. Adams
Secretary, California Environmental Protection Agency

Mary D. Nichols
Chairman, Air Resources Board

James N. Goldstene
Executive Officer, Air Resources Board

Table of Contents

EXECUTIVE SUMMARY	ES-1
I. INTRODUCTION: A FRAMEWORK FOR CHANGE	1
A. Summary of Changes from the Draft Scoping Plan	2
1. General	2
2. Proposed Measures	3
B. Background	4
1. Climate Change Policy in California	4
2. Assembly Bill 32: The Global Warming Solutions Act	5
3. Climate Action Team	6
4. Development of the Greenhouse Gas Emission Reduction Strategy	8
5. Implementation of the Scoping Plan	9
6. Climate Change in California	10
C. California's Greenhouse Gas Emissions and the 2020 Target	11
II. RECOMMENDED ACTIONS	15
A. The Role of State Government: Setting an Example	24
B. The Role of Local Government: Essential Partners	26
C. Emissions Reduction Measures	27
1. California Cap-and-Trade Program Linked to Western Climate Initiative Partner Jurisdictions	30
2. California Light-Duty Vehicle Greenhouse Gas Standards	38
3. Energy Efficiency	41
4. Renewables Portfolio Standard	44
5. Low Carbon Fuel Standard	46
6. Regional Transportation-Related Greenhouse Gas Targets	47
7. Vehicle Efficiency Measures	51
8. Goods Movement	52
9. Million Solar Roofs Program	53
10. Medium/Heavy-Duty Vehicles	53
11. Industrial Emissions	54
12. High Speed Rail	56
13. Green Building Strategy	57
14. High Global Warming Potential Gases	59
15. Recycling and Waste	62
16. Sustainable Forests	63
17. Water	65
18. Agriculture	66
D. Voluntary Early Actions and Reductions	67
1. Voluntary Early Action	68

2. Voluntary Reductions	68
E. Use of Allowances and Revenues	69
III. EVALUATIONS	73
A. Economic Modeling	73
1. Macro-economic Modeling Results	74
2. Impact on Specific Business Sectors	75
3. Household Impacts	78
4. WEI Economic Analysis	79
B. Green Technology	80
C. Cost-Effectiveness	84
D. Small Business Impact	85
E. Public Health/Environmental Benefits Analyses	86
1. Key Air Quality-Related Public Health Benefits	87
2. Approach	90
3. Existing Programs for Air Quality Improvement In California	90
4. Statewide Analysis	91
5. Regional Assessment: South Coast Air Basin Example	92
6. Community Level Assessment: Wilmington Example	92
F. Summary of Societal Benefits	94
1. Energy Diversification	94
2. Mobility and Shifts In Land Use Patterns	95
G. California Environmental Quality Act Functional Equivalent Document	95
H. Administrative Burden	98
I. D. Minimal Emission Threshold	98
IV. IMPLEMENTATION: PUTTING THE PLAN INTO ACTION	99
A. Personal Action	99
B. Public Outreach and Education	100
1. Involving the Public and Stakeholders In Measure Development	101
2. Education and Workforce Development	101
3. Small Businesses	104
C. Implementation of the Plan	104
D. Tracking and Measuring Progress	107
1. Report card	107
2. Tracking Progress by Implementing Agencies	108
3. Progress Toward the State Government Target	108
4. Mandatory Reporting Regulation	108
E. Enforcement	109
F. State and Local Permitting Considerations	110
G. Role of Local Air Districts	111
H. Program Funding	112

V.	A VISION FOR THE FUTURE	113
A.	Collaboration	113
	1. Working Closely with Key Partners	113
	2. International	114
B.	Research	1.16
	1. Unleash the Potential of california's Universities and Private sector	116
	2. Public-Private Partnerships	116
C.	Reducing California's Emissions Further - A Look Forward to 2030	1.17
D.	Conclusion	120
	ACKNOWLEDGMENTS	122

APPENDICES

Appendix A: Assembly Bill 32: The Global Warming Solutions Act of 2006

Appendix B: List of Acronyms and Glossary .

Appendix C: Sector Overviews and Emission Reduction Strategies

Appendix D: **Western** Climate Initiative Documentation

Appendix E: List of Measures

Appendix F: California's Greenhouse Gas Emissions Inventory

Appendix G: Economic Analysis

Appendix H: Public Health Benefits Analyses

Appendix I: Measure Documentation

Appendix J: California Environmental Quality Act Functional Equivalent Document

EXECUTIVE SUMMARY

On September 27, 2006, Governor Schwarzenegger signed Assembly Bill 32, the Global Warming Solutions Act of 2006 (Nunez, Chapter 488, Statutes of 2006). The event marked a watershed moment in California's history. By requiring in law a reduction of greenhouse gas (GHG) emissions to 1990 levels by 2020, California set the stage for its transition to a sustainable, clean energy future. This historic step also helped put climate change on the national agenda, and has spurred action by many other states.

The California Air Resources Board (ARB or Board) is the lead agency for implementing AB 32, which set the major milestones for establishing the program. ARB met the first milestones in 2007: developing a list of discrete early actions to begin reducing greenhouse gas emissions, assembling an inventory of historic emissions, establishing greenhouse gas emission reporting requirements, and setting the 2020 emissions limit.

ARB must develop a Scoping Plan outlining the State's strategy to achieve the 2020 greenhouse gas emissions limit. This Proposed Scoping Plan, developed by ARB in coordination with the Climate Action Team (CAT), proposes a comprehensive set of actions designed to reduce overall greenhouse gas emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health. It will be presented to the Board for approval at its meeting in December 2008. The measures in the Scoping Plan approved by the Board will be developed over the next two years and be in place by 2012..

Reduction Goals

This plan calls for an ambitious but achievable reduction in California's carbon footprint. Reducing greenhouse gas emissions to 1990 levels means cutting approximately 30 percent from business-as-usual emission levels projected for 2020, or about 15 percent from today's levels. On a per-capita basis, that means reducing our annual emissions of 14 tons of carbon dioxide equivalent for every man, woman and child in California down to about 10 tons per person by 2020. This challenge also presents a magnificent opportunity to transform California's economy into one that runs on clean and sustainable technologies, so that all Californians are able to enjoy their rights in the future to clean air, clean water, and a healthy and safe environment.

Significant progress can be made toward the 2020 goal relying on existing technologies and improving the efficiency of energy use. A number of solutions are "off the shelf," and many -especially investments in energy conservation and efficiency- have proven economic benefits. Other solutions involve improving our state's infrastructure, transitioning to cleaner and more secure sources of energy, and adopting 21st century land use planning and development practices.

A Clean Energy Future

Getting to the 2020 goal is not the end of the State's effort. According to climate scientists, California and the rest of the developed world will have to cut emissions by 80 percent from today's levels to stabilize the amount of carbon dioxide in the atmosphere and prevent the most severe effects of global climate change. This long range goal is reflected in California Executive Order S-3-05 that requires an 80 percent reduction of greenhouse gases from 1990 levels by 2050.

Reducing our greenhouse gas emissions by 80 percent will require California to develop new technologies that dramatically reduce dependence on fossil fuels, and shift into a landscape of new ideas, clean energy, and green technology. The measures and approaches in this plan are designed to accelerate this necessary transition, promote the rapid development of a cleaner, low carbon economy, create vibrant livable communities, and improve the ways we travel and move goods throughout the state. This transition will require close coordination of California's climate change and energy policies, and represents a concerted and deliberate shift away from fossil fuels toward a more secure and sustainable future. This is the firm commitment that California is making to the world, to its children and to future generations.

Making the transition to a clean energy future brings with it great opportunities. With these opportunities, however, also come challenges. As the State moves ahead with the development and implementation of policies to spur this transition, it will be necessary to ensure that they are crafted to not just cut greenhouse gas emissions and move toward cleaner energy sources, but also to ensure that the economic and employment benefits that will accompany the transition are realized in California. This means that particular attention must be paid to fostering an economic environment that promotes and rewards California-based investment and development of new technologies and that adequate resources are devoted to building and maintaining a California-based workforce equipped to help make the transition.

A Public Process

Addressing climate change presents California with a challenge of unprecedented scale and scope. Success will require the support of Californians up and down the state. At every step of the way, we have endeavored to engage the public in the development of this plan and our efforts to turn the tide in the fight against global warming.

In preparing the Draft Scoping Plan, ARB and CAT subgroups held dozens of workshops, workgroups, and meetings on specific technical issues and policy measures. Since the release of the draft plan in late June, we have continued our extensive outreach with workshops and webcasts throughout the state. Hundreds of Californians showed up to share their thoughts about the draft plan, and gave us their suggestions for improving it. We've received thousands of postcards, form letters, emails, and over 1,000 unique comments posted to our website or sent by mail. All told, more than 42,000 people commented on the draft Plan.

ARB catalogued and publicly posted all the comments we received. In many instances, we engaged experts and staff at our partner agencies for additional evaluation of comments and suggestions.

This plan reflects the input of Californians at every level. Our partners at other State agencies, in the legislature, and at the local government level have provided key input. We've met with members of community groups to address environmental justice issues, with representatives of California's labor force to ensure that good jobs accompany our transition to a clean energy future, and with representatives of California's small businesses to ensure that this vital part of our state's economic engine flourishes under this plan. We've heeded the advice of public health and environmental experts throughout the state to design the plan so that it provides valuable co-benefits in addition to cutting greenhouse gases. We've also worked with representatives from many of California's leading businesses and industries to craft a plan that works in tandem with the State's efforts to continue strong economic growth.

In short, we've heard from virtually every sector of California's society and economy, reflecting the fact that the plan will touch the life of almost every Californian in some way.

Proposed Scoping Plan Recommendations

The recommendations in this plan were shaped by input and advice from ARB's partners on the Climate Action Team, as well as the Environmental Justice Advisory Committee (EJAC), the Economic and Technology Advancement Advisory Committee (ETAAC), and the Market Advisory Committee (MAC). Like the Draft Scoping Plan, the strength of this plan lies in the comprehensive array of emission reduction approaches and tools that it recommends.

Key elements of California's recommendations for reducing its greenhouse gas emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and

- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the **administrative** costs of the State's long term commitment to AB 32 implementation.

After Board approval of this plan, the measures in it will be developed and adopted through the, normal rulemaking process, with public input.

Key Changes

This plan is built upon the same comprehensive approach to achieving reductions as the draft plan. However, as a result of the extensive public comment we received, this plan includes a number of general and measure-specific changes. The key changes and additions follow.

Additional Reports and Supplements

1. Economic and Public Health Evaluations: This plan incorporates an evaluation of the economic and public health benefits of the recommended measures. These analyses follow the same methodology used to evaluate the Draft Scoping Plan.¹
2. CEQA Evaluation: This plan includes an evaluation of the potential environmental impacts of the Proposed Scoping Plan under the California Environmental Quality Act (CEQA).²

Programmatic Changes

1. Margin of Safety for Uncapped Sectors: The plan provides a 'margin of safety,' that is, additional reductions beyond those in the draft plan to account for measures in uncapped sectors that do not, or may not, achieve the estimated reduction of greenhouse gas emissions in this plan. Along with the certainty provided by the cap, this will ensure that the 2020 target is met.
2. Focus on Labor: The plan includes a discussion of issues directly related to California's labor interests and working families, including workforce development and career technical education. This additional element reflects ARB's existing activities and expanded efforts by State agencies, such as the Employment Development Department, to ensure that California will have a green technology workforce to address the challenges and opportunities presented by the transition to a clean energy future.

¹ Staff will provide an update to the Board to respond to comments received on these analyses.

² This evaluation is contained in Appendix J.

3. Long Term Trajectory: The plan includes an assessment of how well the recommended measures put California on the long-term reduction trajectory needed to do our part to stabilize the global climate.
4. Carbon Sequestration: The plan describes California's role in the West Coast Regional Carbon Sequestration Partnership (WESTCARB), a public-private collaboration to characterize regional carbon capture and sequestration opportunities. In addition, the plan expresses support for near-term development of sequestration technology. This plan also acknowledges the important role of terrestrial sequestration in our forests, rangelands, wetlands, and other land resources.
5. Cap-and-Trade Program: The plan provides additional detail on the proposed cap-and-trade program including a discussion regarding auction of allowances, a discussion of the proposed role for offsets, and additional detail on the mechanisms to be developed to encourage voluntary early action.
6. Implementation: The plan provides additional detail on implementation, tracking and enforcement of the recommended actions, including the important role of local air districts.

Changes to Specific Measures and Programs

1. Regional Targets: ARB re-evaluated the potential benefits from regional targets for transportation-related greenhouse gases in consultation with regional planning organizations and researchers at D.C. Berkeley. Based on this information, ARB increased the anticipated reduction of greenhouse gas emissions for Regional Transportation-Related Greenhouse Gas Targets from 2 to 5 million metric tons of CO₂ equivalent (MMTCO₂E).
2. Local Government Targets: In recognition of the critical role local governments will play in the successful implementation of AB 32, ARB added a section describing this role. In addition, ARB recommended a greenhouse gas reduction goal for local governments of 15 percent below today's levels by 2020 to ensure that their municipal and community-wide emissions match the State's reduction target.
3. Additional Industrial Source Measures: ARB added four additional measures to address emissions from industrial sources. These proposed measures would regulate fugitive emissions from oil and gas recovery and transmission activities, reduce refinery flaring, and require control of methane leaks at refineries. We anticipate that these measures will provide 1.5 MMTCO₂E of greenhouse gas reductions.

4. **Recycling and Waste Re-Assessment:** In consultation with the California Integrated Waste Management Board, ARB re-assessed potential measures in the Recycling and Waste sector. As a result of this review, ARB increased the anticipated reduction of greenhouse gas emissions from the Recycling and Waste Sector from 1 to 10 MMTCO₂E, incorporating measures to move toward high recycling and zero-waste.³
5. **Green Building Sector:** This plan includes additional technical evaluations demonstrating that green building systems have the potential to reduce approximately 26 MMTCO₂E of greenhouse gases. These tools will be helpful in reducing the carbon footprint for new and existing buildings. However, most of these greenhouse gas emissions reductions will already be counted in the Electricity, Commercial/Residential Energy, Water or Waste sectors and are not separately counted toward the AB 32 goal in this plan.
6. **High Global Warming Potential (GWP) Mitigation Fee:** Currently many of the chemicals with very high Global Warming Potential (GWP)-typically older refrigerants and constituents of some foam insulation products-are relatively inexpensive to purchase. ARB includes in this plan a Mitigation Fee measure to better reflect their impact on the climate. The fee is anticipated to promote the development of alternatives to these chemicals, and improve recycling and removal of these substances when older units containing them are dismantled.
7. **Modified Vehicle Reductions:** Based on current regulatory development, ARB modified the expected emissions reduction of greenhouse gases from the Heavy-Duty Vehicle Greenhouse Gas Emission Reduction (Aerodynamic Efficiency) measure and the Tire Inflation measure. The former measure is now expected to achieve 0.9 MMTCO₂E while the latter is now expected to achieve 0.4 MMTCO₂E.
8. **Discounting Low Carbon Fuel Standard Reductions:** ARB modified the expected emission reductions from the Low Carbon Fuel Standard to reflect overlap in claimed benefits with California's clean car law (the Pavley greenhouse gas vehicle standards). This has the result of discounting expected reduction of greenhouse gas emissions from the Low Carbon Fuel Standard by approximately 10 percent.

A Balanced and Comprehensive Approach

Meeting the goals of AB 32 will require a coordinated set of strategies to reduce emissions throughout the economy. These strategies will fit within the comprehensive tracking,

³ Research to help quantify these greenhouse gas emissions reductions is continuing, so only 1 MMTCO₂E of these reductions are currently counted toward the AB 32 goal in this plan. Additional tons will be considered part of the safety margin.

reporting, and enforcement framework that is already being developed and implemented. By 2020, a hard and declining cap will cover 85 percent of California's greenhouse gas emissions, helping to ensure that we meet our reduction targets on time.

AB 32 lays out a number of important factors that have helped to guide the development of this plan and will continue to be considered as regulations are developed over the next few years. Some of the key criteria that have and will be further considered are: cost-effectiveness; overall societal benefits like energy diversification and public health improvements; minimization of leakage; and impacts on specific sectors like small business and disproportionately impacted communities. The comprehensive approach in the plan reflects a balance among these and other important factors and will help to ensure that California meets its greenhouse gas reduction targets in a way that promotes and rewards innovation, is consistent with and helps to foster economic growth, and delivers improvements to the environment and public health.

Many of the measures in this plan complement and reinforce one another. For instance, the Low Carbon Fuel Standard, which reduces the carbon intensity of transportation fuels sold in California, will work in tandem with technology-forcing regulations designed to reduce greenhouse gas emissions from cars and trucks. Improvements in land use and the ways we grow and build our communities will further reduce emissions from the transportation sector.

Many of the measures also build on highly successful long-standing practices in California—such as energy efficiency and the use of renewable energy resources—that can be accelerated and expanded. Increasing the amount of energy we get from renewable energy sources, including placing solar arrays and solar water heaters on houses throughout California, will be supported by an increase in building standards for energy efficiency. Other measures address the transport and treatment of water throughout the state, reduce greenhouse gas emissions that come from ships in California's ports, and promote changes to agricultural and forestry practices. There are also measures designed to safely reduce or recover a range of very potent greenhouse gases - refrigerants and other industrial gases - that contribute to global warming at a level many times greater per ton emitted than carbon dioxide.

Many of the measures in this plan are designed to take advantage of the economic and innovation-related benefits that market-based compliance strategies can provide. Particularly in light of current economic uncertainty, it is important to ensure that California's climate policies be designed to promote and take advantage of economic opportunities while also cutting greenhouse gas emissions. For instance, the cap-and-trade program creates an opportunity for firms to seek out cost-effective emission reduction strategies and provides an incentive for technological innovation. California's clean car standards, which require manufacturers to meet annual average levels of greenhouse gas emissions for all cars they sell in California, also offer flexibility to help ensure compliance. Under California's clean car standards, manufacturers who exceed compliance standards are permitted to bank credits for future use or sell them to other manufacturers. These types of compliance options will be key in ensuring that we are able to meet our reduction targets in a cost-effective manner.

Working with the Western Climate Initiative

California is working closely with six other states and four Canadian provinces in the Western Climate Initiative (WCI) to design a regional greenhouse gas emissions reduction program that includes a cap-and-trade approach. California's participation in WCI creates an opportunity to provide substantially greater reductions in greenhouse gas emissions from throughout the region than could be achieved by California alone. The larger scope of the program also expands the market for clean technologies and helps avoid leakage, that is, the shifting of emissions from sources within California to sources outside the state.

The WCI partners released the recommended design for a regional cap-and-trade program in September 2008.⁴ ARB embraces the WCI effort, and will continue to work with WCI partners. The creation of a robust regional trading system can complement the other policies and measures included in this plan, and provide the means to achieve the reduction of greenhouse gas emissions needed from a wide range of sectors as cost-effectively as possible.

California's Economy, Environment, and Public Health

The approaches in this plan are designed to maximize the benefits that can accompany the transition to a clean energy economy. California has a long and successful track record of implementing environmental policies that also deliver economic benefits. This plan continues in that tradition.

AB 32: Evaluating the Economic Effects

The economic analysis of this plan indicates that implementation of the recommended strategies to address global warming will create jobs and save individual households money.⁵ The analysis also indicates that measures in the plan will position California to move toward a more secure, sustainable future where we invest heavily in energy efficiency and clean technologies. The economic analysis indicates that implementation of that forward-looking approach also creates more jobs and saves individual households more money than if California stood by and pursued an unacceptable course of doing nothing at all to address our unbridled reliance on fossil fuels.

Specifically, analysis of the Proposed Scoping Plan indicates that projected economic benefits in 2020 compared to the business-as-usual scenario include:

- Increased economic production of \$33 billion
- Increased overall gross state product of \$7 billion
- Increased overall personal income by \$16 billion
- Increased per capita income of \$200

⁴ Details of the WCI recommendation are provided in Appendix D.

⁵ See Appendix G.

- Increased jobs by more than 100,000

Furthermore, the results of the economic analysis may underestimate the economic benefits of the plan since the models that were used do not account for savings that result from the flexibility provided under market-based programs.

AB 32: The Environmental and Public Health Costs of Inaction

A key factor that was not weighed in the overall economic analysis is the potential cost of doing nothing. When these costs are taken into account, the benefits associated with implementing a comprehensive plan to cut greenhouse gas emissions become even clearer. As a state, California is particularly vulnerable to the costs associated with unmitigated climate change.

A summary report from the California Climate Change Center notes that a warming California climate would generate more smoggy days by contributing to ozone formation while also fostering more large brush and forest fires. Continuing increases in global greenhouse gas emissions at business-as-usual rates would result, by late in the century, in California losing 90 percent of the Sierra snow pack, sea level rising by more than 20 inches, and a three to four times increase in heat wave days. These impacts will translate into real costs for California, including flood damage and flood control costs that could amount to several billion dollars in many regions such as the Central Valley, where urbanization and limited river channel capacity already exacerbate existing flood risks.⁶ Water supply costs due to scarcity and increased operating costs would increase as much as \$689 million per year by 2050.⁷ ARB analysis shows that due to snow pack loss, California's snow sports sector would be reduced by \$1.4 billion (2006 dollars) annually by 2050 and shed 14,500 jobs; many other sectors of California's economy would suffer as well.

Failing to address climate change also carries with it the risk of substantial public health costs, primarily as a result of rising temperatures. Sustained triple-digit heat waves increase the health risk for several segments of the population, especially the elderly. But higher average temperatures will also increase the interactions of smog-causing chemicals with sunlight and the atmosphere to produce higher volumes of toxic byproducts than would otherwise occur. In the 2006 report to the Governor from the California Climate Center, it was reported that global increases in temperature will lead to increased concentrations and emissions of harmful pollutants

⁶ A Summary Report from: California Climate Change Center. *Our Changing Climate: Assessing the Risks to California*. Document No. CEC-500-2006-077. July 2006. <http://www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF> (accessed October 12, 2008)

⁷ A Report from: California Climate Change Center. *Climate Warming and Water Supply Management in California*. Document No. CEC-500-2005-195-SF. March 2006. pp.13-14 <http://www.energy.ca.gov/2005publications/CEC-500-2005-195/CEC-500-2005-195-SF.PDF> (accessed October 12, 2008).

in California.⁸ Some cities in California are disproportionately susceptible to temperature increases since they already have elevated pollution levels and are subject to the heat-island effect that reduces nighttime cooling, allowing heat to build up and magnify the creation of additional harmful pollution. Low-income communities are disproportionately impacted by climate change, lacking the resources to avoid or adapt to these impacts. For example, low-income residents are less likely to have access to air conditioning to prevent heat stroke and death in heat waves. For California, then, taking action with other regions and nations to help mitigate the impacts of climate change will help slow temperature rise: This in turn will likely result in fewer premature deaths from respiratory and heat-related causes, and many thousands fewer hospital visits and days of illness.

California cannot avert the impacts of global climate change by acting alone. We can, however, take a national and international leadership role in this effort by demonstrating that taking firm and reasoned steps to address global warming can actually help spur economic growth.

AB 32: Providing Savings for Households and Businesses

This plan builds upon California's thirty-year track record of pioneering energy efficiency programs. Many of the measures in the plan will deliver significant gains in energy efficiency throughout the economy. These gains, even after increases in per unit energy costs are taken into account, will help deliver annual savings of between \$400 and \$500 on average by 2020 for households, including low-income households.

Businesses, both large and small, will benefit too. By 2020, the efficiency measures in the plan will decrease overall energy expenditures for businesses even after taking into account projected rises in per unit energy costs. Since small businesses spend a greater proportional share of revenue on energy-related costs, they are likely to benefit the most. Furthermore, businesses throughout the state will benefit from the overall economic growth that is projected to accompany implementation of AB 32 between now and 2020.

Similar savings are projected in the transportation sector. By reducing greenhouse gas pollution from more efficient and alternatively-fueled cars and trucks under California's Clean Car law (the Pavley greenhouse gas standards), consumers save on operating costs through reduced fuel use. Although cars will be marginally more expensive, owners will be paid back with savings over the lifetime of the car, and the average new car buyer will have an extra \$30 each month for other expenditures. Current estimates indicate that consumer savings in 2020 for California's existing clean car standards will be over \$12 billion. These savings give Californians the ability to invest their dollars in other sectors of the state's economy.

⁸ A Report from: California Climate Change Center. *Scenarios of Climate Change in California: An Overview*. Document No. CEC-500-2005-186-SF. February 2006. <http://www.energy.ca.gov/2005publications/CEC-500-2005-186/CEC-500-2005-186-SF.PDF> (accessed October 12, 2008)

AS 32: Driving Investment and Job Growth

Addressing climate change also provides a strong incentive for investment in California. Our leadership in environmental and energy efficiency policy has already helped attract a large and growing share of the nation's venture capital investment in green technologies. Since AB 32 was signed into law, venture capital investment in California has skyrocketed. In the second quarter of 2008 alone, California dominated world investment in clean technology venture capital, receiving \$800 million of the global total of \$2 billion.⁹

These investments in building a new clean tech sector also translate directly into job growth. A study by D.C. Berkeley's Energy and Resources Group and Goldman School of Public Policy found that investments in green technologies produce jobs at a higher rate than investments in comparable conventional technologies.¹⁰ And the National Venture Capital Association estimates that each \$100 million in venture capital funding helps create 2,700 jobs, \$500 million in annual revenues for two decades and many indirect jobs.¹¹

AS 32: Improving Public Health

The public health analysis conducted for this Plan indicates that cutting greenhouse gases will also provide a wide range of additional public health and environmental benefits. By 2020, the economic value alone of the additional air-quality related benefits is projected to be on the order of \$2.2 billion. Our analysis indicates that implementing the Proposed Scoping Plan will result in a reduction of 15 tons per day of combustion-generated soot (PM 2.5) and 61 tons per day of oxides of nitrogen (precursors to smog). These reductions in harmful air pollution would provide the following estimated health benefits in 2020, above and beyond those projected to be achieved as a result of California's other existing public health protection and improvement efforts:

- An estimated 400 premature deaths statewide will be avoided
- Almost 11,000 incidences of asthma and lower respiratory symptoms will be avoided
- 67,000 work loss days will be avoided

⁹ Press Release from Cleantech Network LLC, *Cleantech Venture Investment Reaches Record of \$2 Billion in 2008*. July 08, 2008. <http://cleantech.com/about/pressreleases/011008.cfm> (accessed October 12, 2008)

¹⁰ Report of the Renewable and Appropriate Energy Laboratory. *Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Generate?* Energy and Resources Group/Goldman School of Public Policy at University of California, Berkeley. April 13, 2004. <http://rael.berkeley.edu/old-site/renewables.jobs.2006.pdf> (accessed October 12, 2008)

¹¹ Report prepared for the National Venture Capital Association. *Venture Impact 2004: Venture Capital Benefits to the U.S. Economy*. Prepared by: Global Insight. June 2004. http://www.globalinsight.com/publicDownload/genericContent/07-20-04_fullstudy.pdf (accessed October 12, 2008)

In addition to the quantified health benefits, our analysis also indicates that implementation of the measures in the plan will deliver a range of other public health benefits. These include health benefits associated with local and regional transportation-related greenhouse gas targets that will facilitate greater use of alternative modes of transportation such as walking and bicycling. These types of moderate physical activities reduce many serious health risks including coronary heart disease, diabetes, hypertension and obesity.¹² Furthermore, as specific measures are developed, ARB and public health experts will work together to ensure that they are designed with an eye toward capturing a broad range of public health co-benefits.

The results of both the economic and public health analyses are clear: guiding California toward a clean energy future with reduced dependence on fossil fuels will grow our economy, improve public health, protect the environment and create a more secure future built on clean and sustainable technologies.

State Leadership

California is committed to once again lead and support a pioneering effort to protect the environment and improve public health while maintaining a vibrant economy; Every agency, department and division will bring climate change considerations into its policies, planning and analysis, building and expanding current efforts to green its fleet and buildings, and managing its water, natural resources, and infrastructure to reduce greenhouse gas emissions.

In all these efforts, California is exercising a leadership role in global action to address climate change. It is also exemplifying the essential role states play as the laboratories of innovation for the nation. As California has done in the past in addressing emissions that caused smog, the State will continue to develop innovative programs that benefit public health and improve our environment and quality of life.

Moving Beyond 2020

AB 32 requires a return to 1990 emission levels by 2020. The Proposed Scoping Plan is designed to achieve that goal. However, 2020 is by no means the end of California's journey to a clean energy future. In fact, that is when many of the strategies laid out in this plan will just be kicking into high gear.

Take, for example, the regional transportation-related greenhouse gas emissions targets. In order to achieve the deep cuts in greenhouse gas emissions we will need beyond 2020 it will be necessary to significantly change California's current land use and transportation planning policies. Although these changes will take time, getting started now will help put California on course to cut statewide greenhouse gas emissions by 80 percent in 2050 as called for by Governor Schwarzenegger.

¹² Appendix H contains a reference list of studies documenting the public health benefits of alternative transportation.

Similarly, measures like the cap-and-trade program, energy efficiency programs, the California clean car standards, and the renewables portfolio standard will all play central roles in helping California meet its 2020 reduction requirements. Yet, these strategies will also figure prominently in California's efforts beyond 2020. Some of these measures, like energy efficiency programs and the renewables portfolio standard, have already delivered greenhouse gas emissions reduction benefits that will expand over time. Others, like the cap-and-trade program, will put in place a foundation on which to build well into the future. All of these measures, and many others in the plan, will ensure that California meets its 2020 target and is positioned to continue its international role as leader in the fight against global warming to 2050 and beyond.

A Shared Challenge

Californians are already responding to the challenge of reducing greenhouse gas emissions. Over 120 California cities and counties have signed on to the U.S. Conference of Mayors Climate Protection Agreement¹³ and many have established offices of climate change and are developing comprehensive plans to reduce their carbon footprint. Well over 300 companies, municipalities, organizations and corporations are members of the California Climate Action Registry, reporting their greenhouse gas emissions on an annual basis. Many other businesses and corporations are making climate change part of their fiscal and strategic planning. ARB encourages these initial efforts and has set in place a policy to support and encourage other voluntary early reductions.

Successful implementation of AB 32 will depend on a growing commitment by a majority of companies to include climate change as an integral part of their planning and operations. Individuals and households throughout the state will also have to take steps to consider climate change at home, at work and in their recreational activities. To support this effort, this plan includes a comprehensive statewide outreach program to provide businesses and individuals with the widest range of information so they can make informed decisions about reducing their carbon footprints.

Californians will not have to wait for decades to see the benefits of a low carbon economy. New homes can achieve a near zero-carbon footprint with better building techniques and existing technologies, such as solar arrays and solar water heaters. Many older homes can be retrofitted to use far less energy than at present. A new generation of vehicles, including plug-in hybrids, is poised to appear in dealers' showrooms, and the development of the infrastructure to support hydrogen fuel cell cars continues. Cities and new developments will be more walkable, public transport will improve, and high-speed rail will give travelers a new clean transportation option.

¹³ Mayors Climate Protection Center. *List of Participating Mayors*.
<http://www.usmayors.org/climateprotectionllist.asp> (accessed October 12, 2008)

That world is just around the corner. What lies beyond is even more exciting. Where will California be in 2050? By harnessing the ingenuity and creativity of our society and sparking the imagination of the next generation of Californians, California will make the transition to a clean-energy, low-carbon society and become a healthier, cleaner and more sustainable place to live. This plan charts a course toward that future.

ARB invites comment and input from the broadest array of the public and stakeholders as we move forward over the next two years to develop the individual measures, and develop the policies that will move us toward sustainable clean energy and away from fossil fuels. Your participation will help craft the mechanisms and measures to make this plan a reality. This is California's plan and together, we need to make the necessary changes to address the greatest environmental challenge we face. As Governor Schwarzenegger stated when he signed AB 32 into law two years ago, "We owe our children and we owe our grandchildren. We simply must do everything in our power to fight global warming before it is too late."

I. INTRODUCTION: A Framework for Change

California strengthened its commitment to address climate change when Governor Schwarzenegger signed Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006 (Nunez, Chapter 488, Statutes of 2006). This groundbreaking legislation represents a turning point for California and makes it clear that a business-as-usual approach toward greenhouse gas emissions is no longer acceptable. In light of the need for strong and immediate action to counter the growing threat of global warming, AB 32 sets forth an aggressive timetable for achieving results.

AB 32 embodies the idea that California can continue to grow and flourish while reducing its greenhouse gas emissions and continuing its long-standing efforts to achieve healthy air, and protect and enhance public health. Achieving these goals will involve every sector of the state's \$1.7 trillion economy and touch the life of every Californian.

As the lead agency for implementing AB 32, the California Air Resources Board (ARB or the Board) released a Draft Scoping Plan in June 2008, which laid out a comprehensive statewide plan to reduce California's greenhouse gas emissions to 1990 levels by 2020. This Proposed Scoping Plan builds upon that draft. This plan sets forth a comprehensive reduction strategy that combines market-based regulatory approaches, other regulations, voluntary measures, fees, policies, and programs that will significantly reduce emissions of greenhouse gases and help make our state cleaner, more efficient and more secure.

The Board will consider this Proposed Scoping Plan for approval at its December 2008 meeting. Once approved by the Board, the Scoping Plan will provide specific direction for the State's greenhouse gas emissions reduction program. The recommended measures will be developed into regulations over the next two years, to go into effect by January 1, 2012. As specific measures in the plan are developed, we will update and adjust our regulatory proposals as necessary to ensure that they reflect any new information, additional analyses, new technologies or other factors that emerge during the process.

ARB has conducted a transparent, wide-ranging public process to develop the Proposed Scoping Plan, including numerous meetings, workshops, and seminars with stakeholders. Substantial input on the development of the Proposed Scoping Plan came from formal advisory committees, meetings with industrial and business groups, non-profit organizations and members of the public, as well as written comments on the Draft Scoping Plan. ARB will continue its outreach activities to seek ongoing public input and will encourage early and continued involvement in the implementation of the plan from all Californians.

A. Summary of Changes from the Draft Scoping Plan

On June 26, 2008, ARB released the Draft Scoping Plan and requested public comment and input, while continuing to analyze the measures and their impact on California. Since the Draft Scoping Plan release, ARB has received almost 1,000 unique written comments as well as hundreds of verbal comments at workshops and in meetings. Taking into account that some written comments were submitted by multiple individuals, all told more than 42,000 people have commented on the draft plan. ARB has also completed detailed economic and public health evaluations of its recommendations. This Proposed Scoping Plan reflects changes made to the draft plan as a result of the comments and input received and the additional analysis performed. The Proposed Plan does not incorporate modifications as a result of comments on the economic and public health supplements. ARB is evaluating those comments and will propose any necessary modifications to the Board.

The key changes between the Draft Scoping Plan and the Proposed Scoping Plan are summarized below. The Proposed Scoping Plan includes the following modifications:

1. General

- Incorporates economic and public health analyses of the Proposed Scoping Plan. These analyses show that the recommendations in the Proposed Scoping Plan will have a net positive impact on both the economy and public health. These analyses follow the same methodology used to evaluate the Draft Scoping Plan. ARB is continuing to consider comments on the methodology and assumptions used in these analyses. Staff will provide an update to the Board as needed to respond to comments received on these analyses.
- Provides a "margin of safety" by recommending additional greenhouse gas emissions reduction strategies to account for measures in uncapped sectors that do not achieve the greenhouse gas emissions reductions estimated in the Proposed Scoping Plan. Along with the certainty provided by the cap, this will ensure that the 2020 target is met.
- Expands the discussion of workforce development, education, and labor to more fully reflect existing activities and the role of other state agencies in ensuring an adequate green technology workforce.
- Assesses how well the recommended measures put California on the long-term reduction trajectory needed to do our part to stabilize the global climate,
- Describes California's role in the West Coast Regional Carbon Sequestration Partnership (WESTCARB), a public-private collaboration to characterize regional carbon capture and sequestration opportunities, and expresses support for near-term advancement of the technology and monitoring of its development. Acknowledges the important role of terrestrial sequestration.
- Provides greater detail on the mechanisms to be developed to encourage voluntary early action.
- Provides additional detail on implementation, tracking and enforcement of the recommended actions, including the important role of local air districts.

- Evaluates the potential environmental impacts of the Proposed Scoping Plan under the California Environmental Quality Act (CEQA). This evaluation is contained in Appendix J.

2. Proposed Measures

- Provides greater detail on the proposed cap-and-trade program including more detail on the allocation and auction of allowances, and clarification of the proposed role of offsets.
- Re-evaluates the potential benefits from regional targets for transportation-related greenhouse gases in consultation with regional planning organizations and researchers at UC Berkeley. Based on this information, ARB increased the anticipated greenhouse gas emissions reductions for Regional Transportation-Related Greenhouse Gas Targets from 2 to 5 million metric tons of CO₂ equivalent (MMTCO₂E).
- In recognition of the importance of local governments in the successful implementation of AB 32, adds a section describing this role and recommends a greenhouse gas emissions reduction target for local government municipal and community-wide emissions of a 15 percent reduction from current levels by 2020 to parallel the State's target.
- Adds four measures to address emissions from industrial sources. These proposed measures would regulate fugitive emissions from oil and gas recovery and gas transmission activities, reduce refinery flaring, and remove the methane exemption for refineries. These proposed measures are anticipated to provide 1.5 MMTCO₂E of greenhouse gas reductions in 2020.
- In consultation with the California Integrated Waste Management Board, re-assesses potential measures in the Recycling and Waste sector. As a result of this assessment, ARB increased the reduction of greenhouse gas emissions that can ultimately be anticipated from the Recycling and Waste Sector from 1 to 10 MMTCO₂E, recommending measures to move toward high recycling and zero-waste. Research to help quantify these greenhouse gas emissions is continuing, so only 1 MMTCO₂E of these reductions is currently counted towards the AB 32 goal in this plan.
- Estimates the potential reduction of greenhouse gas emissions from the Green Building sector. Green building systems have the potential to reduce approximately 26 MMTCO₂E of greenhouse gas emissions. Since most of these emissions reductions are counted in the Electricity, Commercial/Residential Energy, Water or Waste sectors, emission reductions in the Green Building sector are not separately counted toward the AB 32 goal.
- Adds a High Global Warming Potential (GWP) Mitigation Fee measure to ensure that the climate impact of these gases is reflected in their price to encourage reduced use and end-of-life losses, as well as the development of alternatives.
- Reduces the expected greenhouse gas emissions reduction from the Heavy-Duty Vehicle Greenhouse Gas Emissions Reduction (Aerodynamic Efficiency) measure and the Tire Inflation measure based on ongoing regulatory

development. The Heavy-Duty Vehicle Greenhouse Gas Emissions Reduction (Aerodynamic Efficiency) measure is now expected to achieve 0.9 MMTCO₂E and the Tire Inflation measure is now expected to achieve 0.4 MMTCO₂E.

- Modifies the expected reduction of greenhouse gas emissions from the Low Carbon Fuel Standard to account for potential overlap of benefits with the Pavley greenhouse gas vehicle standards. ARB discounted the expected emission reductions from the Low Carbon Fuel Standard by 10 percent.
- After further evaluation, moves the Heavy-Duty Truck Efficiency measure to the Goods Movement measure. ARB expects that market dynamics will provide an inducement to improve heavy-duty truck efficiency, and reductions in greenhouse gases in the future. ARB would consider pursuing direct requirements to reduce greenhouse gases if truck efficiency does not improve in the future.

B. Background

1. Climate Change Policy in California

California first addressed climate change in 1988 with the passage of AB 4420 (Sher, Chapter 1506, Statutes of 1988). This bill directed the California Energy Commission (CEC) to study global warming impacts to the state and develop an inventory of greenhouse gas emissions sources. In 2000, SB 1771 (Sher, Chapter 1018, Statutes of 2000) established the California Climate Action Registry to allow companies, cities and government agencies to voluntarily record their greenhouse gas emissions in anticipation of a possible program that would allow them to be credited for early reductions.

In 2001, the United Nations' Intergovernmental Panel on Climate Change (IPCC) reported that "there is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities." The following year, AB 1493 (Pavley, Chapter 200, Statutes of 2002) was signed into law, requiring ARB to develop regulations to reduce greenhouse gas emissions from passenger vehicles, light-duty trucks and non-commercial vehicles sold in California.

Recognizing the value of regional partners in addressing climate change, the governors of California, Washington, and Oregon created the West Coast Global Warming Initiative in 2003 with provisions for the states to work together on climate change-related programs.

Two years later Governor Schwarzenegger signed Executive Order S-3-05, calling for the State to reduce greenhouse gas emissions to 1990 levels by 2020 and to reduce greenhouse gas emissions to 80 percent below 1990 levels by 2050. The 2020 goal was established to be an aggressive, but achievable, mid-term target, and the 2050 greenhouse gas emissions reduction goal represents the level scientists believe is necessary to reach levels that will stabilize climate.

In 2006, SB 1368 (Perata, Chapter 598, Statutes of 2006) created greenhouse gas performance standards for new long-term financial investments in base-load electricity generation serving California customers. This law is designed to help spur the transition toward cleaner energy in California by placing restrictions on the ability of utilities to build new carbon-intensive plants or enter into new contracts with high carbon sources of electricity. Expiration of existing utility long-term contracts with coal plants will reduce greenhouse gas emissions when such generation is replaced by lower greenhouse gas-emitting resources. These reductions will reduce the need for utilities to submit allowances to comply with the cap-and-trade program.

2. Assembly Bill 32: The Global Warming Solutions Act

In 2006, the Legislature passed and Governor Schwarzenegger signed AB 32, the Global Warming Solutions Act of 2006, which set the 2020 greenhouse gas emissions reduction goal into law. It directed ARB to begin developing discrete early actions to reduce greenhouse gases while also preparing a Scoping Plan to identify how best to reach the 2020 limit. The reduction measures to meet the 2020 target are to become operative by 2012.

AB 32 includes a number of specific requirements for ARB:

- *Identify the statewide level of greenhouse gas emissions in 1990 to serve as the emissions limit to be achieved by 2020 (Health and Safety Code (HSC) §38550).* In December 2007, the Board approved the 2020 emission limit of 427 million metric tons of carbon dioxide equivalent (MMTCO₂E) of greenhouse gases.
- *Adopt a regulation requiring the mandatory reporting of greenhouse gas emissions (HSC §38530).* In December 2007, the Board adopted a regulation requiring the largest industrial sources to report and verify their greenhouse gas emissions. The reporting regulation serves as a solid foundation to determine greenhouse gas emissions and track future changes in emission levels.
- *Identify and adopt regulations for Discrete Early Actions that could be enforceable on or before January 1, 2010 (HSC §38560.5).* The Board identified nine Discrete Early Action measures including potential regulations affecting landfills, motor vehicle fuels, refrigerants in cars, port operations and other sources in 2007. The Board has already approved two Discrete Early Action measures (ship electrification at ports and reduction of high GWP gases in consumer products). Regulatory development for the remaining measures is ongoing.
- *Ensure early voluntary reductions receive appropriate credit in the implementation of AB 32 (HSC §38562(b)(3)).* In February 2008, the Board approved a policy statement encouraging voluntary early actions and establishing a procedure for project proponents to submit quantification methods to be evaluated by ARB. ARB, along with California's local air districts and the California Climate Action Registry, is working to implement this program. Voluntary programs are discussed further in Chapter II and in Chapter IV.

- *Convene an Environmental Justice Advisory Committee (EJAC) to advise the Board in developing the Scoping Plan and any other pertinent matter in implementing AB 32 (HSC §38591).* The EJAC has met 12 times since early 2007, providing comments on the proposed Early Action measures and the development of the Scoping Plan, and submitted its comments and recommendations on the draft Scoping Plan in October 2008. ARB will continue to work with The EJAC as AB 32 is implemented.
- *Appoint an Economic and Technology Advancement Advisory Committee (ETAAC) to provide recommendations for technologies, research and greenhouse gas emission reduction measures (HSC §38591).* After a year-long public process, The ETAAC submitted a report of their recommendations to the Board in February 2008. The ETAAC also reviewed and provided comments on the Draft Scoping Plan.

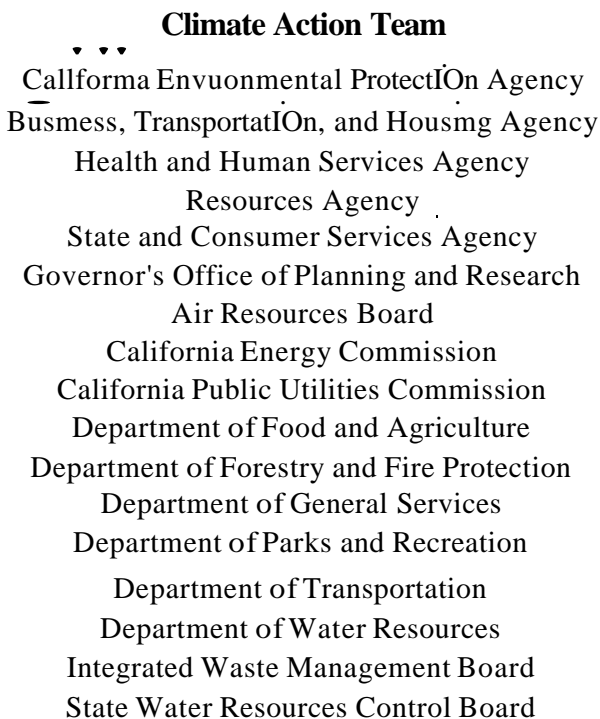
3. Climate Action Team

In addition to establishing greenhouse gas emissions reduction targets for California, Executive Order S-3-05 established the Climate Action Team (CAT) for State agencies in 2005. Chaired by the Secretary of the California Environmental Protection Agency (CalEPA), the CAT has helped to direct State efforts on the

reduction of greenhouse gas emissions and engage key State agencies including ARB. The Health and Human Services Agency, represented by the Department of Public Health, is the newest member of the CAT. Based on numerous public meetings and the review of thousands of submitted comments, the CAT released its *Just* report in March 2006, identifying key carbon reduction recommendations for the Governor and Legislature.

In April 2007, the CAT released a second report, "Proposed Early Actions to Mitigate Climate Change in California," which details numerous strategies that should be initiated prior to the 2012 deadline for other climate action regulations and efforts.

AB 32 recognizes the essential role of the CAT in coordinating overall climate policy. AB 32 does not affect the existing authority of other state agencies, and in addition to



ARB, many state agencies will be responsible for implementing the measures and strategies in this plan. The CAT is central to the success of AB 32, which requires an unprecedented level of cooperation and coordination across State government. The CAT provides the leadership for these efforts and helps ARB work closely with our state partners on the development and implementation of the strategies in the Proposed Scoping Plan.

There are currently 12 subgroups within the CAT - nine that address specific economic sectors, and three that were formed to analyze broad issues related to implementing a multi-sector approach to greenhouse gas emissions reduction efforts. The CAT sector-based subgroups include: Agriculture, Cement, Energy, Forest, Green Buildings, Land Use, Recycling and Waste Management, State Fleet, and Water-Energy. The members of these subgroups are drawn from departments that work with or regulate industries in the sector. ARB participated in each of the subgroups. All of the subgroups held public meetings and solicited public input, and many had multiple public workshops.

In March 2008, the subgroups collectively submitted more than 100 greenhouse gas emissions reduction measures to ARB for consideration in the Draft Scoping Plan. Many of those recommendations are reflected in this plan, and a number of them focus on reducing greenhouse gas emissions from energy production and use.

Through the Energy Subgroup the California Energy Commission (CEC) and the California Public Utilities Commission (CPUC) are conducting a joint proceeding to provide recommendations on how best to address electricity and natural gas in the implementation of AB 32, including evaluation of how the Electricity sector might best participate in a cap-and-trade program. The two Commissions forwarded interim recommendations to ARB in March 2008 that supported inclusion of the Electricity sector in a multi-sector cap-and-trade program, and measures to increase the penetration of energy efficiency programs in both buildings and appliances and to increase renewable energy sources. The two Commissions have developed a second proposed decision that was released in September 2008. This proposed decision provides more detailed recommendations that relate to the electricity and natural gas sectors. Because implementation of the Scoping Plan will require careful coordination with the State's energy policy, ARB will continue working closely with the two Commissions on this important area during the implementation of the recommendations in the Scoping Plan.

There are also three subgroups which are not sector-specific. The Economic Subgroup reviewed cost information associated with potential measures that were included in the 2006 CAT report with updates reflected in the report, "Updated Macroeconomic Analysis of Climate Strategies," in October 2007. This report provided an update of the macroeconomic analysis presented in the March 2006 CAT report to Governor Schwarzenegger and the Legislature. The Research Subgroup coordinates climate change research and identifies opportunities for collaboration, and is presently working on a report to the Governor. The State Operations Subgroup

has been created to work with State agencies to create a statewide plan to reduce State government's greenhouse gas emissions by a minimum of 30 percent by 2020.

In the first quarter of 2009, the Climate Action Team will release a report on its activities outside of its involvement in the development of the Proposed Scoping Plan. The CAT report will focus on several cross-cutting topics with which members of the CAT have been involved since the publication of the 2006 CAT report. The topics to be covered include research on the physical and consequent economic impacts of climate change as well as climate change research coordination efforts among the CAT members. There will also be an update on the important climate change adaptation efforts led by the Resources Agency and a discussion of cross-cutting issues related to environmental justice concerns. The CAT report will be released in draft form and will be available for public review in December 2008.

4. Development of the Greenhouse Gas Emission Reduction Strategy

In developing the Proposed Scoping Plan, ARB considered the State's existing climate change policy initiatives and the Early Action measures identified by the Board. Several advisory groups were formed to assist ARB in developing the Proposed Scoping Plan, including the Environmental Justice Advisory Committee (EJAC), the Economic and Technology Advancement Committee (ETAAC), and the Market Advisory Committee (MAC).

The Environmental Justice Advisory Committee (HSC §38591(a) et seq) advises ARB on development of the Scoping Plan and any other pertinent matter in implementing AB 32. The Board appoints its members, based on nominations received from environmental justice organizations and community groups.

The Economic and Technology Advancement Advisory Committee (HSC §38591(d)) includes members who are appointed by the Board based on expertise in fields of business, technology research and development, climate change, and economics. The ETAAC advises ARB on activities that will facilitate investment in, and implementation of, technological research and development opportunities, funding opportunities, partnership development, technology transfer opportunities, and related areas that lead to reductions of greenhouse gas emissions.

Members of the Market Advisory Committee (created under Executive Order S-20-06) were appointed by the Secretary of CalEPA based on their expertise in economics and climate change. The MAC advised ARB on the design of a cap-and-trade program for reducing greenhouse gas emissions.

Along with input from the advisory groups, ARB received submittals to a public solicitation for ideas, and numerous comments during public workshops, workgroup meetings, community meetings, and meetings with stakeholder groups. ARB held numerous workshops on the Draft Scoping Plan and convened workgroup meetings focused on program design and economic analysis. ARB and other involved State

agencies also held sector-specific technical workshops to look in greater detail at potential emissions reduction measures.

ARB also looked outward to examine programs at the regional, national and international levels. ARB met with and learned from experts from the European Union, the United Kingdom, Japan, Australia, the United Nations, the Regional Greenhouse Gas Initiative, the RECLAIM program, and the U.S. Environmental Protection Agency (U.S. EPA).

After the release of the Draft Scoping Plan, ARB conducted workshops and community meetings around the state to solicit public input. The Environmental Justice Advisory Committee and the Economic and Technology Advancement Advisory Committee held meetings to review and provide additional comments on the Draft Scoping Plan. In addition, ARB held meetings with numerous stakeholder groups to discuss specific greenhouse gas emissions reduction measures.

As described before, ARB has reviewed and considered both the written comments and the verbal comments received at the public workshops and meetings with stakeholders. This input, along with additional analysis, has ultimately shaped this Proposed Scoping Plan.

5. Implementation of the Scoping Plan

The foundation of the Proposed Scoping Plan's strategy is a set of measures that will cut greenhouse gas emissions by nearly 30 percent by the year 2020 as compared to business as usual and put California on a course for much deeper reductions in the long term. In addition to pursuing the reduction of greenhouse gas emissions, other strategies to mitigate climate change, such as carbon capture and storage (underground geologic storage of carbon dioxide), should also be further explored. And, as greenhouse gas reduction measures are implemented, we will continually evaluate how these measures can be optimized to also help deliver a broad range of public health benefits.

Most of the measures in this Proposed Scoping Plan will be implemented through the full rulemaking processes at ARB or other agencies. These processes will provide opportunity for public input as the measures are developed and analyzed in more detail. This additional analysis and public input will likely provide greater certainty about the estimates of costs and expected greenhouse gas emission reductions, as well as the design details that are described in this Proposed Scoping Plan. With the exception of Discrete Early Actions, which will be in place by January 1, 2010, other regulations are expected to be adopted by January 1, 2011 and take effect at the beginning of 2012.

Some of the measures in the plan may deliver more emission reductions than we expect; others less. It is also very likely that we will figure out new and better ways to cut greenhouse gas emissions as we move forward. New technologies will no doubt be developed, and new ideas and strategies will emerge. The Scoping Plan puts

California squarely on the path to a clean energy future but it also recognizes that adjustments will probably need to occur along the way and that as additional tools become available they will augment, and in some cases perhaps even replace, existing approaches.

California will not be implementing the measures in this Plan in a vacuum. Significant new action on climate policy is likely at the federal level and California and its partners in the Western Climate Initiative are working together to create a regional effort for achieving significant reductions of greenhouse gas emissions throughout the western United States and Canada. California is also developing a state Climate Adaptation Strategy to reduce California's vulnerability to known and projected climate change impacts.

ARB and other State agencies will continue to monitor, lead and participate in these broader activities. ARB will adjust the measures described here as necessary to ensure that California's program is designed to facilitate the development of integrated and cost-effective regional, national, and international greenhouse gas emissions reduction programs. (HSC§38564)

6. Climate Change in California

The impacts of climate change on California and its residents are occurring now. Of greater concern are the expected future impacts to the state's environment, public health and economy, justifying the need to sharply cut greenhouse gas emissions.

In the Findings and Declarations for AB 32, the Legislature found that:

"The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to the marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other health-related problems."

The Legislature further found that global warming would cause detrimental effects to some of the state's largest industries, including agriculture, winemaking, tourism, skiing, commercial and recreational fishing, forestry, and the adequacy of electrical power.

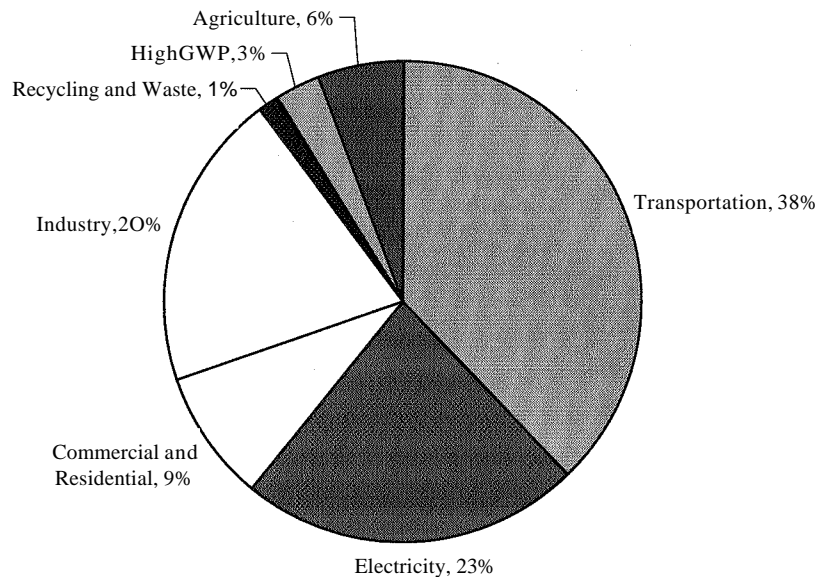
The impacts of global warming are already being felt in California. The Sierra snowpack, an important source of water supply for the state, has shrunk 10 percent in the last 100 years. It is expected to continue to decrease by as much as 25 percent by 2050. World-wide changes are causing sea levels to rise - about 8 inches of increase has been recorded at the Golden Gate Bridge over the past 100 years - threatening low coastal areas with inundation and serious damage from storms.

C. California's Greenhouse Gas Emissions and the 2020 Target

California is the fifteenth largest emitter of greenhouse gases on the planet, representing about two percent of the worldwide emissions. Although carbon dioxide is the largest contributor to climate change, AB 32 also references five other greenhouse gases: methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). Many other gases contribute to climate change and would also be addressed by measures in this Proposed Scoping Plan.

Figure 1 and Table 1 show 2002 to 2004 average emissions and estimates for projected emissions in 2020 without any greenhouse gas reduction measures (business-as-usual case). The 2020 business-as-usual forecast does not take any credit for reductions from measures included in this Proposed Plan, including the Pavley greenhouse gas emissions standards for vehicles, full implementation of the Renewables Portfolio Standard beyond current levels of renewable energy, or the solar measures. Additional information about the assumptions in the 2020 forecast is provided in Appendix F.

Figure 1: California's Greenhouse Gas Emissions (2002-2004 Average)¹⁴



As seen in Figure 1, the Transportation sector -largely the cars and trucks that move goods and people – is the largest contributor with 38 percent of the state's total greenhouse gas emissions. Table 1 shows that if we take no action, greenhouse gas emissions in the

¹⁴ Air Resources Board. Greenhouse Gas Inventory. <http://www.arb.ca.gov/cc/inventory/inventory.htm> (accessed October 12, 2008)

Transportation sector are expected to grow by approximately 25 percent by 2020 (an increase of 46 MMTCO₂E).

The Electricity and Commercial/Residential Energy sector is the next largest contributor with over 30 percent of the statewide greenhouse gas emissions. Although electricity imported into California accounts for only about a quarter of our electricity, imports contribute more than half of the greenhouse gas emissions from electricity because much of the imported electricity is generated at coal-fired power plants. AB 32 specifically requires ARB to address emissions from electricity sources both inside and outside of the state.

California's Industrial sector includes refineries, cement plants, oil and gas production, food processors, and other large industrial sources. This sector contributes almost 20 percent of California's greenhouse gas emissions, but the sector's emissions are not projected to grow significantly in the future. The sector termed recycling and waste management is a unique system, encompassing not just emissions from waste facilities but also the emissions associated with the production, distribution and disposal of products throughout the economy.

Although high global warming potential (GWP) gases are a small contributor to historic greenhouse gas emissions, levels of these gases are projected to increase sharply over the next several decades, making them a significant source by 2020.

The Forest sector is unique in that forests both emit greenhouse gases and uptake carbon dioxide (CO₂). While the current inventory shows forests as a sink of 4.7 MMTCO₂E, carbon sequestration has declined since 1990. For this reason, the 2020 projection assumes no net emissions from forests.

The agricultural greenhouse gas emissions shown are largely methane emissions from livestock, both from the animals and their waste. Emissions of greenhouse gases from fertilizer application are also important contributors from the Agricultural sector. ARB has begun a research program to better understand the variables affecting these emissions. Opportunities to sequester CO₂ in the Agricultural sector may also exist; however, additional research is needed to identify and quantify potential sequestration benefits.

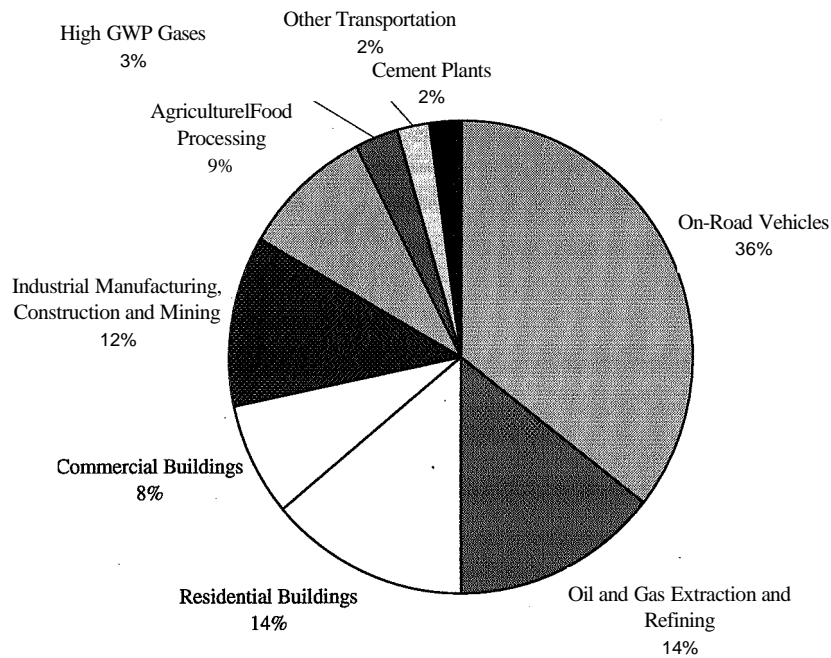
In December 2007, ARB approved a greenhouse gas emissions target for 2020 equivalent to the state's calculated greenhouse gas emissions level in 1990. ARB developed the 2020 target after extensive technical work and a series of stakeholder meetings. The 2020 target of 427 MMTCO₂E requires the reduction of 169 MMTCO₂E, or approximately 30 percent, from the state's projected 2020 emissions of 596 MMTCO₂E (business-as-usual) and the reduction of 42 MMTCO₂E, or almost 10 percent, from 2002-2004 average emissions.

Table 1: 2002-2004 Average Emissions and 2020 Projected Emissions (Business-as-Usual)¹⁵ (MMTC02E)

Sector	2002-2004 Average Emissions	Projected 2020 Emissions [BAU]
Transportation.	179.3	225.4
Electricity	109.0	139.2
Commercial and Residential	41.0	46.7
Industry	95.9	100.5
Recycling and Waste	5.6	7.7
HighGWP	14.8	46.9
Agriculture	27.7	29.8
Forest Net Emissions	-4.7	0.0
Emissions Total	469	596

Figure 2 presents California's historic greenhouse gas emissions in a different way - based not on the source of the emissions, but on the end use. This chart highlights the importance of addressing on-road transportation sources of greenhouse gas emissions, as well as the significant contribution from the heating, cooling, and lighting of buildings.

Figure 2: California's Greenhouse Gas Emissions - A Demand-Side View -



¹⁵ Ibid.

The data shown in this section provide two ways to look at California's greenhouse gas profile - emissions-based and end use (demand side)-based. While it is possible to illustrate the inventory many different ways, no chart or graph can fully display how diverse economic sectors fit together. California's economy is a web of activity where seemingly independent sectors and subsectors operate interdependently and often synergistically. For example, reductions in water use reduce the need to pump water, directly lowering electricity use and associated greenhouse gas emissions. Similarly, reducing the generation of waste reduces the need to transport the waste to landfills -lowering transportation emissions and, possibly, landfill methane emissions. Increased recycling or re-use reduces the carbon emissions embedded in products - it takes less energy to make a soda can made from recycled aluminum than from virgin feedstock.

The measures included in this Proposed Scoping Plan are identified discretely, but many impact each other, and changes in one measure can directly overlap and have a ripple effect on the efficacy and success of other measures. The measures and policies outlined in this Plan reflect these interconnections, and highlight the need for all agencies to work collaboratively to implement the Scoping Plan.

II. RECOMMENDED ACTIONS

Achieving the goals of AB 32 in a cost-effective manner will require a wide range of approaches. Every part of California's economy needs to play a role in reducing greenhouse gas emissions. ARB's comprehensive greenhouse gas emissions inventory lists emission sources ranging from the largest refineries and power plants to small industrial processes and farm livestock. The recommended measures were developed to reduce greenhouse gas emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately impact low-income and minority communities. These measures also put the state on a path to meet the long-term 2050 goal of reducing California's greenhouse gas emissions to 80 percent below 1990 levels. This trajectory is consistent with the reductions that are needed globally to help stabilize the climate. While the scale of this effort is considerable, our experience with cultural and technological changes makes California well-equipped to handle this challenge.

ARB evaluated a comprehensive array of approaches and tools to achieve these emission reductions. Reducing greenhouse gas emissions from the wide variety of sources can best be accomplished through a cap-and-trade program along with a mix of complementary strategies that combine market-based regulatory approaches, other regulations, voluntary measures, fees, policies, and programs. ARB will monitor implementation of these measures to ensure that the State meets the 2020 limit on greenhouse gas emissions.

An overall limit on greenhouse gas emissions from most of the California economy - the "capped sectors" - will be established by the cap-and-trade program. (The basic elements of the cap-and-trade program are described later in this chapter.) Within the capped sectors, some of the reductions will be accomplished through direct regulations such as improved building efficiency standards and vehicle efficiency measures. Whatever additional reductions are needed to bring emissions within the cap are accomplished through price incentives posed by emissions allowance prices. Together, direct regulation and price incentives assure that emissions are brought down cost-effectively to the level of the overall cap. ARB also recommends specific measures for the remainder of the economy - the "uncapped sectors."

Key elements of California's recommendations for reducing its greenhouse gas emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

The recommended greenhouse gas emissions reduction measures are listed in Table 2 and are summarized in Section C below. The total reduction for the recommended measures slightly exceeds the 169 MMTC02E of reductions estimated in the Draft Scoping Plan. This is the net effect of adding several measures and adjusting the emission reduction estimates for some other measures. The 2020 emissions cap in the cap-and-trade program is preserved at the same level as in the Draft Scoping Plan (365 MMTC02E).

The measures listed in Table 2 lead to emissions reductions from sources within the capped sectors (146.7 MMTC02E) and from sources or sectors not covered by cap-and-trade (27.3 MMTC02E). As mentioned, within the capped sectors the reductions derive both from direct regulation and from the incentives posed by allowance prices. Further discussion of how the cap-and-trade program and the complementary measures work together to achieve the overall target is provided below.

Table 2 also lists several other recommended measures which will contribute toward achieving the 2020 statewide goal, but whose reductions are not (for various reasons including the potential for double counting) additive with the other measures. Those measures and the basis for not including their reductions are further discussed in Section C.

Table 2: Recommended Greenhouse Gas Reduction Measures

Recommended Reduction Measures	Reductions Counted Towards 2020 Target (MMTCO₂E)
ESTIMATED REDUCTIONS RESULTING FROM THE COMBINATION OF CAP-AND-TRADE PROGRAM AND COMPLEMENTARY MEASURES	146.7
California Light-Duty Vehicle Greenhouse Gas Standards	
• Implement Pavley standards	31.7
• Develop Pavley IT light-duty vehicle standards	
Energy Efficiency	
• Building/appliance efficiency, new programs, etc.	26.3
• Increase CHP generation by 30,000 GWh	
• Solar Water Heating (AB 1470 goal)	
Renewables Portfolio Standard (33% by 2020)	21.3
Low Carbon Fuel Standard	15
Regional Transportation-Related GHG Targets ¹⁶	5
Vehicle Efficiency Measures	4.5
Goods Movement	
• Ship Electrification at Ports	3.7
• System-Wide Efficiency Improvements	
Million Solar Roofs	2.1
Medium/Heavy Duty Vehicles	
• Heavy-Duty Vehicle Greenhouse Gas Emission Reduction (Aerodynamic Efficiency)	1.4
• Medium- and Heavy-Duty Vehicle Hybridization	
High Speed Rail	1.0
Industrial Measures (for sources covered under cap-and-trade program)	
• Refinery Measures	0.3
• Energy Efficiency & Co-Benefits Audits	
Additional Reductions Necessary to Achieve the Cap	34.4
ESTIMATED REDUCTIONS FROM UNCAPPED SOURCES/SECTORS	27.3
High Global Warming Potential Gas Measures	20.2
Sustainable Forests	5.0
Industrial Measures (for sources not covered under cap and trade program)	
• Oil and Gas Extraction and Transmission	1.1
Recycling and Waste (landfill methane capture)	1.0
TOTAL REDUCTIONS COUNTED TOWARDS 2020 TARGET	174
Other Recommended Measures	Estimated 2020 Reductions (MMTCO₂E)
State Government Operations	1-2
Local Government Operations	TBD
Green Buildings	26
Recycling and Waste (other measures)	9
Water Sector Measures	4.8
Methane Capture at Large Dairies	1.0

¹⁶ This number represents an estimate of what may be achieved from local land use changes. It is not the SB 375 regional target. ARB will establish regional targets for each Metropolitan Planning Organization (MPO) region following the input of the Regional Targets Advisory Committee and a public consultation process with MPOs and other stakeholders per SB 375.

The development of a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system is a central feature of the overall recommendation. This program will lead to prices on greenhouse gas emissions, prices that will spur reductions in greenhouse gas emissions throughout the California economy, through application of existing technologies and through the creation of new technological and organizational options. The rationale for combining a cap-and-trade program with complementary measures was outlined by the Market Advisory Committee, which noted the following in its recommendations to the ARB:

Before setting out the key design elements of a cap-and-trade program it is important to explain how the proposed emissions trading approach relates to other policy measures. The following considerations seem especially relevant:

- The emissions trading program puts a cap on the total emissions generated by facilities covered under the system. Because a certain number of emissions allowances are put in circulation in each compliance period, this approach provides a measure of certainty about the total quantity of emissions that will be released from entities covered under the program.
- The market price of emissions allowances yields an enduring price signal for GHG emissions across the economy. This price signal provides incentives for the market to find new ways to reduce emissions.
- By itself, a cap-and-trade program alone will not deliver the most efficient mitigation outcome for the state. There is a strong economic and public policy basis for other policies that can accompany an emissions trading system.¹⁷

The Economic and Technology Advancement Advisory Committee (ETAAC) also addressed the benefits associated with a combined policy of cap and trade and complementary measures.

A declining cap can send the right price signals to shape the behavior of consumers when purchasing products and services. It would also shape business decisions on what products to manufacture and how to manufacture them. Establishing a price for carbon and other GHG emissions can efficiently tilt decision-making toward cleaner alternatives. This cap and trade approach (complemented by technology-forcing performance standards) avoids the danger of having government or other centralized decision-makers choose specific technologies, thereby limiting the flexibility to allow other options to emerge on a level playing field.

¹⁷ Recommendations of the Market Advisory Committee to the California Air Resources Board. *Recommendations/or Designing a Greenhouse Gas-Cap-and-Trade System/or California*. June 30, 2007. p. 19. http://www.climatechange.ca.gov/publications/market_advisory_committee/2007-06-29_MAC_FINAL_REPORT.PDF (accessed October 12, 2008)

If markets were perfect, such a cap and trade system would bring enough new technologies into the market and stimulate the necessary industrial RD&D to solve the climate change challenge in a cost effective manner. As the Market Advisory Committee notes, however, placing a price on GHG emissions addresses only one of many market failures that impede solutions to climate change. Additional market barriers and co-benefits would not be addressed if a cap and trade system were the only state policy employed to implement AB 32. Complementary policies will be needed to spur innovation, overcome traditional market barriers (e.g., lack of information available to energy consumers, different incentives for landlords and tenants to conserve energy, different costs of investment financing between individuals, corporations and the state government, etc.) and address distributional impacts from possible higher prices for goods and services in a carbon-constrained world.¹⁸

The Environmental Justice Advisory Committee (EJAC) also supports an approach that includes a price on carbon along with complementary measures. Although the EJAC recommends that the carbon price be established through a carbon fee rather than through a cap-and-trade program, they recognize the importance of mutually supportive policies:

California should establish a three-pronged approach for addressing greenhouse gases: (1) adopting standards and regulations; (2) providing incentives; and (3) putting a price on carbon via a carbon fee. The three pieces support one another and no single prong can work without equally robust support from the others.¹⁹

In keeping with the rationale outlined above, ARB finds that it is critically important to include complementary measures directed at emission sources that are included in the cap-and-trade program. These measures are designed to achieve cost-effective emissions reductions while accelerating the necessary transition to the low-carbon economy required to meet the 2050 target:

- The already adopted Light-Duty Vehicle Greenhouse Gas Standards are designed to accelerate the introduction of low-greenhouse gas emitting vehicles, reduce emissions and save consumers money at the pump.
- The Low Carbon Fuel Standard (LCFS) is a flexible performance standard designed to accelerate the availability and diversity of low-carbon fuels by taking into consideration the full life-cycle of greenhouse gas emissions. The LCFS will reduce emissions and make our economy more resilient to future petroleum price volatility.
- The Regional Transportation-Related Greenhouse Gas Targets provide incentives for channeling investment into integrated development patterns and **transportation**

¹⁸ Recommendations of the Economic and Technical Advancement Advisory Committee (ETAAC), Final Report. *Technologies and Policies to Consider for Reducing Greenhouse Gas Emissions in California*. February 14, 2008. pp. 1-4 <http://www.arb.ca.gov/cc/etaacIETAACFinalReport2-11-08.pdf> (accessed October 12, 2008)

¹⁹ Recommendations and Comments of the Environmental Justice Advisory Committee on the Implementation of the Global Warming Solutions Act of 2006 (AB32) on the Draft Scoping Plan. October 2008. p. 10. http://www.arb.ca.gov/cc/ejac/ejac_comments_final.pdf (accessed October 12, 2008)

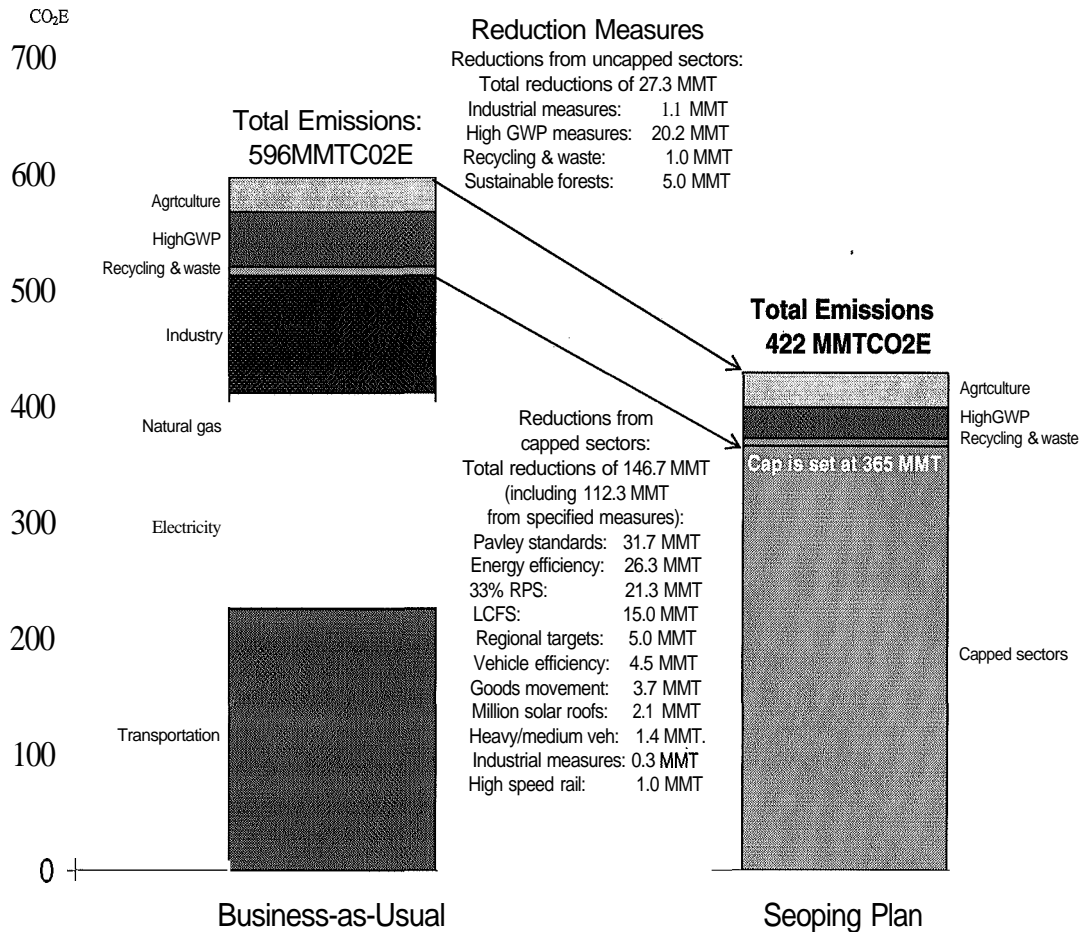
infrastructure, through improved planning. Improved planning and the resulting development are essential for meeting the 2050 emissions target.

- In the Energy sector, measures will provide better information and overcome institutional barriers that slow the adoption of cost-effective energy efficiency technologies. Enhanced energy efficiency programs will provide incentives for customers to purchase and install more efficient products and processes, and building and appliance standards will ensure that manufacturers and builders bring improved products to market.
- The Renewables Portfolio Standard (RPS) promotes multiple objectives, including diversifying the electricity supply. Increasing the RPS to 33 percent is designed to accelerate the transformation of the Electricity sector, including investment in the transmission infrastructure and system changes to allow integration of large quantities of intermittent wind and solar generation:
- The Million Solar Roofs Initiative uses incentives to transform the rooftop solar market by driving down costs over time.
- The Goods Movement program is primarily intended to achieve criteria and toxic air pollutant reductions but will provide important greenhouse gas benefits as well.
- Similar to the light duty vehicle greenhouse gas standards, the heavy duty and medium duty vehicle measures and the additional light duty vehicle efficiency measures aim to achieve cost-effective reductions of GHG emissions and save fuel.

Each of these complementary measures helps to position the California economy for the future by reducing the greenhouse gas intensity of products, processes, and activities. When combined with the absolute and declining emissions limit of the cap-and-trade program, these policies ensure that we cost-effectively achieve our greenhouse gas emissions goals and set ourselves on a path towards a clean low carbon future.

Figure 3 illustrates how the recommended emission reduction measures together put California on a path toward achieving the 2020 goal: The left hand column in Figure 3 shows total projected business as usual emissions in 2020, by sector (596 *MMTCO₂E*). The right hand column shows 2020 emissions after applying the Scoping Plan recommended reduction measures (422 *MMTCO₂E*). The measures that accomplish the needed reductions are listed in between the columns. As Figure 3 shows, there are a total of 27.3 *MMTCO₂E* in reductions from uncapped sectors, and 146.7 *MMTCO₂E* in reductions from capped sectors.

Figure 3: California Greenhouse Gas Emissions in 2020 and Recommended Reduction Measures



The recommended cap-and-trade program provides covered sources with the flexibility to pursue low cost reductions. It is important to recognize, however, that other recommended measures also provide compliance flexibility. As is often the case with ARB regulations, many of the measures establish performance standards and allow regulated entities to determine how best to achieve the required emission level. This approach rewards innovation and allows facilities to take advantage of the best way to meet the overarching environmental objective.

Table 3 lists the proposed measures that include compliance flexibility or market mechanisms. This flexibility ranges from the potential for tradable renewable energy credits in the Renewables Portfolio Standard to the incentives to encourage emission reductions in electricity and natural gas efficiency programs to the averaging, banking and trading mechanisms in the Pavley and Low Carbon Fuel Standard programs to a multi-sector cap-and-trade program.

Table 3: Measures With Flexible 'Market Compliance Features

Measure	Estimated Reductions
Additional Reductions from Capped Sectors	34.4
California Light-Duty Vehicle Greenhouse Gas Standards (Pavley I & II)	31.7
Renewables Portfolio Standard	21.3
Electricity Efficiency	15.2
Low Carbon Fuel Standard	15.0
Mitigation Fee on High GWP Gases	5.0
Natural Gas Efficiency	4.3
Goods Movement Systemwide Efficiency	3.5
Medium/Heavy Duty Vehicle Hybridization	0.5
Total	130.9

The recommended mix of measures builds on a strong foundation of previous action in California to address climate change and broader environmental issues. The program recommended here relies on implementing existing laws and regulations that were adopted to reduce greenhouse gas emissions and other policy goals; strengthening and expanding existing programs; implementing the discrete early actions adopted by the Board in 2007; and new measures developed during the Scoping Plan process itself.

The mix of measures recommended in this Proposed Plan provides a comprehensive approach to reduce emissions to achieve the 2020 target, and to initiate the transformations required to achieve the 2050 target. The cap-and-trade program and complementary measures will cover about 85 percent of greenhouse gas emissions throughout California's economy. ARB recognizes that due to several factors, including information discovered during regulatory development, technology maturity, and implementation challenges, actual reductions from individual measures aimed at achieving the 2020 target may be higher or lower than current estimates. The inclusion of many of these emissions within the cap-and-trade program, along with a margin of safety in the uncapped sectors, will help ensure that the 2020 target is met. The combination of approaches provides certainty that the overall program will meet the target despite some degree of uncertainty in the estimates for any individual measure. Additionally, by internalizing the cost of *CO₂E* emissions throughout the economy, the cap-and-trade program supports the complementary measures and provides further incentives for innovation and continuing emissions reductions from energy producers and consumers setting us on a path toward our 2050 goals.

Some emissions sources are not currently suitable for inclusion in the cap-and-trade program due to challenges associated with precise measurement, tracking or sector structure. For these emissions sources, ARB is including measures designed to focus on waste management, agriculture, forestry, and certain emissions of high GWP gases, a rapidly growing component of California's greenhouse gas emissions inventory.

California's economy is expected to continue to experience robust growth through 2020. Economic modeling, including evaluation of the effects on low-income Californians, shows that the measures included within this Proposed Scoping Plan can be implemented with a net positive effect on California's long-term economic growth. The evaluation of related public health and environmental benefits of the various measures also shows that implementation will result in not only reduced greenhouse gas emissions and improved public health, but also in a beneficial effect on California's environment. The results of these evaluations are presented in Chapter III.

AB 32 includes specific criteria that ARB must consider before adopting regulations for market-based compliance mechanisms to implement a greenhouse gas reduction program, and directs the Board, to the extent feasible, to design market-based compliance mechanisms to prevent any increase in the emissions of toxic air contaminants or criteria air pollutants. In the development of regulations that contain market mechanisms, ARB will consider the economic, environmental and public health effects, and the evaluation of potential localized impacts. These results will be used to institute appropriate economic, environmental and public health safeguards.

ARB has also designed the recommendation to ensure that reductions will come from throughout the California economy. Transportation accounts for the largest share of California's greenhouse gas emissions. Accordingly, a large share of the reduction of greenhouse gas emissions from the recommended measures comes from this sector. Measures include the inclusion of transportation fuels in the cap-and-trade program, the Low Carbon Fuel Standard to reduce the carbon intensity of transportation fuels, enforcement of regulations that reduce greenhouse gas emissions from vehicles, and policies to reduce transportation emissions by changes in future land use patterns and community design as well as improvements in public transportation.

In the Energy sector, the recommended measures increase the amount of electricity from renewable energy sources, and improve the energy efficiency of industries, homes and buildings. The inclusion of these sectors and the Industrial sector in the cap-and-trade program provides further assurance that significant cost-effective reductions will be achieved from the sectors that contribute the greatest emissions. Additional energy production from renewable resources may also rely on measures suggested in the Agriculture, Water, and the Recycling and Waste Management Sectors.

Other sectors are also called upon to cut emissions. The cap-and-trade program covers industrial sources and natural gas use. The recommended measures would require industrial processes to examine how to lower their greenhouse gas emissions and be more energy efficient, and would require goods movement operations through California's ports to be more energy efficient. Other measures address waste management, agricultural and forestry practices, as well as the transport and treatment of water throughout the state. Finally, the recommended measures address ways to reduce or eliminate the emissions of high global warming potential gases that, on a per-ton basis, contribute to global warming at a level many times greater than carbon dioxide.

As the Scoping Plan is implemented, ARB and other agencies will coordinate with the Green Chemistry Initiative, particularly in the Green Building and Recycling/Waste sectors. Green Chemistry is a fundamentally new approach to environmental protection that emphasizes environmental protection at the design stage of product and manufacturing processes, rather than focusing on end-of-pipe or end-of-life activities, or a single environmental medium, such as air, water or soil. This new approach will reduce the use of harmful chemicals, generate less waste, use less energy, and, accordingly, will contribute toward California's greenhouse gas reduction goals.

A. The Role of State Government: Setting an Example

For many years California State government has successfully incorporated environmental principles in managing its resources and running its business. The Governor has directed State agencies to sharply reduce their building-related energy use and encouraged our State-run pensions to invest in energy efficient and clean technologies.²⁰ The State also has been active in procuring low-emission, alternative fuel vehicles in its large fleet.

While State government has already accomplished much to reduce its greenhouse gas emissions, it can and must do more. State agencies must lead by example by continuing to reduce their greenhouse gas emissions. Therefore, California State government has established a target of reducing its greenhouse gas emissions by a *minimum* of 30 percent below its estimated business-as-usual emissions by 2020 - approximately a 15 percent reduction from current levels.

As an owner-operator of key infrastructure, State government has the ability to ensure that the most advanced, cost-effective environmental performance requirements are used in the design, construction, and operation of State facilities. As a purchaser with significant market power, State government has the ability to demand that the products and services it procures contribute positively toward California's targets to reduce greenhouse gas emissions, such as through the efforts of Environmentally Preferable Purchasing. As an investor of more than \$400 billion,²¹ State government has the ability to prioritize low-carbon investments. With more than 350,000 employees, State government is uniquely situated to adopt and implement policies that give State workers the ability to decrease their individual carbon impact, including encouraging siting facilities within communities to enhance balance in jobs and housing, **encouraging** carpooling, biking, walking, telecommuting, the use of public transit, and the use of alternative work schedules.

²⁰Governor Schwarzenegger signed Executive Order S-20-04 on December 14, 2004. This Order contains a number of directives, including a set of aggressive-goals for reducing state building energy use and requested the California Public Employees Retirement System (CalPERS) and the California State Teachers Retirement System (CalSTRS) to target resource-efficient buildings for real estate investments and commit funds toward clean, efficient and sustainable technologies.

²¹ CalPERS and CalSTRS are the two largest pension systems in the nation with investments in excess of \$400 billion as of August 2008.

Myriad opportunities exist for California State government to operate more efficiently. These opportunities will not only reduce greenhouse gas emissions but also will produce savings for California taxpayers. Initiatives now underway that will contribute to the State government reduction target include the Governor's Green Building Initiative and the Department of General Services' efforts to increase the number of fuel-efficient vehicles in the State fleet.

Major efforts to expand renewable energy use and divest from coal-fired power plants are currently underway. Together with energy conservation and efficiency strategies on water projects, roadways, parks, and bridges, these efforts all play major roles in reducing the State's greenhouse gas emissions. State agencies should review their travel practices and make greater use of teleconferencing and videoconferencing to reduce the need for business travel, particularly air travel.

State agencies are now examining their policies and operations to determine how they can reduce their greenhouse gas emissions. These findings will be instrumental as each cabinet-level agency registers with the California Climate Action Registry (CCAR) to record and report their individual carbon footprints. The Climate Action Team has created a new State Government Operations sub-group that will work closely with the agencies to review the results of their evaluations and the CCAR reports to determine how best to achieve the maximum reductions possible.

State agencies must take the lead in driving this low-carbon economy by reducing their own emissions, and also by serving as a catalyst for local government and private sector activity. New "Best Practices" implemented by State agencies can be transferred to other entities within California, the nation, and internationally. By increasing cooperation and coordination across organizational boundaries, State government will maximize the experience and contributions of each agency involved to achieve the 30 percent reduction of greenhouse gas emissions while growing the economy and protecting the environment.

State government's impact on emissions goes far beyond its own buildings, vehicles, projects, and employees. State government casts a sizable "carbon shadow" - that is, the climate change impact of legislative, executive, and financial actions of State agencies that affect Californians now and in the future. For example, the California Energy Commission (CEC) recently initiated a proceeding to consider how to align its permitting process with the State's greenhouse gas and renewable energy policy goals. ARB intends to work closely with the CEC during this proceeding. New power plants, both fossil-fuel fired and renewable generation, will be a critical part of the state's electricity mix in coming decades. The investments that are made in this new infrastructure in the next several years will become part of the backbone of the state's electricity supply for decades to come. This timely investigation will be a critical element of California's ability to meet the AB 32 emissions reduction target for 2020, the ambitious target set by the Governor for 2050, and also the specific goal of achieving 33 percent renewables in the state's electricity mix. The Governor's Office of Planning and Research and the Resources Agency are developing proposed amendments to the California Environmental Quality Act (CEQA) Guidelines to

provide guidance on how to address greenhouse gases in CEQA documents. As required by SB 97 (Chapter 185, Statutes of 2007), the amended CEQA guidelines will be adopted by January 1, 2010.

In addition, agencies such as the California Labor and Workforce Development Agency, the Business, Transportation and Housing Agency and the newly created Green Collar Jobs Council (AB 3018, Chapter 312, Statutes of 2008) are dedicated to economic development, training, safety, labor relations, and employment development throughout the State. ARB will coordinate with the Council and also with other State agencies to address workforce needs and facilitate a smooth transition to California's emerging low-carbon economy that maximizes economic development and employment opportunities in California.

The State expends funds to provide services to California residents - from preserving our natural resources to building and maintaining infrastructure like roads, bridges and dams. California residents should reap all of the benefits of these projects, including any associated quantifiable and marketable reductions in greenhouse gas emissions. Because of this, California should retain ownership of these greenhouse gas emissions reductions and use them to promote the goals of AB 32 and other goals of the state.

California State government can also lead through example by aligning its efforts to reduce greenhouse gas emissions with efforts to protect and improve public health. As a new member of the Climate Action Team, the Department of Public Health will help ensure that measures to combat global warming also incorporate public health protection and improvement strategies. As discussed below, these and many other State leadership efforts can be built upon at the local level as well.

B. The Role of Local Government: Essential Partners

Local governments are essential partners in achieving California's goals to reduce greenhouse gas emissions. They have broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect greenhouse gas emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Many of the proposed measures to reduce greenhouse gas emissions rely on local government actions.

Over 120 California cities have already signed on to the U.S. Conference of Mayors Climate Protection Agreement. In addition, over 30 California cities and counties have committed to developing and implementing Climate Action Plans. Many local governments and related organizations have already begun educating Californians on the benefits of energy efficiency measures, public transportation, solar homes, and recycling. These communities have not only demonstrated courageous leadership in taking initiative to reduce greenhouse gas emissions, they are also reaping important co-benefits, including local economic benefits, more sustainable communities, and improved quality of life.

Land use planning and urban growth decisions are also areas where successful implementation of the Scoping Plan relies on local government. Local governments have primary authority to plan, zone, approve, and permit how and where land is developed to accommodate population growth and the changing needs of their jurisdictions. Decisions on how land is used will have large impacts on the greenhouse gas emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas sectors.

To provide local governments guidance on how to inventory and report greenhouse gas emissions from government buildings, facilities, vehicles, wastewater and potable water treatment facilities, landfill and composting facilities, and other government operations, ARB recently adopted the Local Government Operations Protocol. ARB encourages local governments to use this protocol to track their progress in achieving reductions from municipal operations. ARB is also developing an additional protocol for community emissions. This protocol will go beyond just municipal operations and include emissions from the community as a whole, including residential and commercial activity. These local protocols will play a key role in ensuring that strategies that are developed and implemented at the local level, like urban forestry and greening projects, water and energy efficiency projects, and others, can be appropriately quantified and credited toward California's efforts to reduce greenhouse gas emissions.

In addition to tracking emissions using these protocols, ARB encourages local governments to adopt a reduction goal for municipal operations emissions and move toward establishing similar goals for community emissions that parallel the State commitment to reduce greenhouse gas emissions by approximately 15 percent from current levels by 2020. To consolidate climate action resources and aid local governments in their emission reduction efforts, the ARB is developing various tools and guidance for use by local governments, including the next generation of best practices, case studies, a calculator to help calculate local greenhouse gas emissions, and other decision support tools.

The recent passage of SB 375 (Steinberg, Chapter 728, Statutes of 2008) creates a process whereby local governments and other stakeholders work together within their region to achieve reduction of greenhouse gas emissions through integrated development patterns, improved transportation planning, and other transportation measures and policies. The implementation of regional transportation-related greenhouse gas emissions targets and SB 375 are discussed in more detail in Section C.

C. Emissions Reduction Measures

The Scoping Plan will build on California's successful history of balancing effective regulations with economic progress. Several types of measures have been recommended. The plan includes a California cap-and-trade program that will be integrated with a broader regional market to maximize cost-effective opportunities to achieve GHG emissions reductions. The plan also includes transformational measures that are designed to help pave the path toward California's clean energy future. For example, the Low Carbon Fuel

Standard (LCFS) is a performance standard with flexible compliance mechanisms that will incent the development of a diverse set of clean, low-carbon transportation fuel options. Similarly, the plan recognizes the importance of local and regional government leadership in ensuring that California's land use and transportation planning processes are designed to be consistent with efforts to achieve a clean energy future and to protect and enhance public health and safety.

The Proposed Scoping Plan also contains a number of targeted measures that are designed to overcome existing barriers to action such as lack of information, lack of coordination, or other regulatory and institutional factors. Energy efficiency is a classic example where cost-effective action often is not taken due to lack of complete information, relatively high initial costs, and mismatches between who pays for and who benefits from efficiency investments. These problems often mean that efficiency measures are not taken that would save money in the long term for small businesses, home owners and renters. While California has a long history of success in implementing regulations and programs to encourage energy efficiency, innovative methods to overcome these economic and information barriers are needed to provide the benefits of increased efficiency to more Californians and to meet our greenhouse gas emissions reduction goals.

Several of the recommended measures complement each other. For example, the LCFS will provide clean transportation fuel options. The Pavley performance standards help deploy vehicles that can use many of the low-carbon fuels, including advanced biofuels, electricity and hydrogen. The combined operation of both programs will make it more likely that more efficient, less polluting vehicles will use the cleanest possible fuels. In addition, both of these programs will benefit from ARB's zero-emission vehicle program, which focuses on deployment of plug-in battery-electric and fuel cell vehicles. All of these strategies are expandable beyond 2020, and are needed as vital components to reach the State's 2050 goal.

The cap-and-trade program creates an emissions limit or "cap" on the sectors responsible for the vast majority of California's greenhouse gas emissions and provides capped sources significant flexibility in how they collectively achieve the reductions necessary to meet the cap. The other measures in these capped sectors provide a clear path toward achieving reductions required by the cap, while simultaneously addressing market barriers and creating the low-carbon energy options needed to achieve our long term climate goals. In the design of the cap-and-trade program, ARB will also evaluate possible ways to include features that complement the other measures, such as consideration of allowance set-asides that could be used to help achieve or exceed the aggressive energy efficiency goals included in this Plan.

Both required measures and other cost-effective actions by capped sectors will contribute toward achievement of the cap. For example, increasing energy efficiency will reduce electricity demand, thereby reducing the need for utilities to submit allowances to comply with the cap-and-trade program. In this way, energy efficiency contributes to real reductions toward the cap. Expiration of existing utility long-term contracts with coal plants will reduce GHG emissions when such generation is replaced by renewable generation, coal with carbon sequestration, or natural gas generation, which emits less CO₂ per megawatt-hour.

Additionally, measures and other actions that result in reductions in energy demand 'downstream' of capped sectors will help achieve the cap. For example, the Pavley vehicle standards, building efficiency standards, and land use planning that contributes to reduced transportation fuel demand will all reduce emissions by reducing the demand for upstream energy production. These downstream entities will further benefit from these reductions by avoiding any costs that would be passed through from a cap-and-trade system.

Discrete Early Actions

In September 2007, ARB approved a list of nine Discrete Early Actions to reduce greenhouse gas emissions and is currently in the process of developing regulations and programs based on these measures. Regulations implementing the Discrete Early Action measures must be adopted and in effect by January 1, 2010 (HSC §38560.5 (b)). All the Discrete Early Actions are included in the recommended measures and are shown below in Table 4.

Table 4: Anticipated Board Consideration Dates ' for Discrete Early Actions

Discrete Early Action	Anticipated Board Consideration
Green Ports – Ship Electrification at Ports	December 2007 - Adopted
Reduction of High GWP Gases in Consumer Products	June 2008 - Adopted
SmartWay - Heavy-Duty Vehicle Greenhouse Gas Emission Reduction (Aerodynamic Efficiency)	December 2008
Reduction of Perfluorocarbons from Semiconductor Manufacturing	February 2009
Improved Landfill Gas Capture	January 2009
Reduction of HFC-134a from Do-It-Yourself Motor Vehicle Servicing	January 2009
SF ₆ Reductions from the Non-Electric Sector	January 2009
Tire Inflation Program	March 2009
Low Carbon Fuel Standard	March 2009

The following sections describe the recommended measures in this Proposed Scoping Plan. Additional information about these measures is provided in Appendix C.

1. California Cap-and-Trade Program Linked to Western Climate Initiative Partner Jurisdictions

Implement a broad-based California cap-and-trade program to provide a firm limit on emissions. Link the California cap-and-trade program with other Western Climate Initiative Partner programs to create a regional market system to achieve greater environmental and economic benefits for California. Ensure California's program meets all applicable AB 32 requirements for market-based mechanisms.

California is working closely with other states and provinces in the Western Climate Initiative (WCI) to design a regional cap-and-trade program that can deliver reductions of greenhouse gas emissions throughout the region. ARB will develop a cap-and-trade program for California that will link with the programs in the other WCI Partner jurisdictions to create a regional cap-and-trade program. The WCI Partner jurisdictions released the program design document on September 23, 2008 (see Appendix D). ARB will continue to work with the WCI Partner jurisdictions to develop and implement the cap-and-trade program. ARB will also design the California program to meet the requirements of AB 32, including the need to consider any potential localized impacts and ensure that reductions are enforceable by the Board.

Based on the requirements of AB 32, regulations to implement the cap-and-trade program need to be developed by January 1, 2011, with the program beginning in 2012. This rule development schedule will be coordinated with the WCI timeline for developing a regional cap-and-trade program. Preliminary plans for this rulemaking are described later in this section.

A cap-and-trade program sets the total amount of greenhouse gas emissions allowable for facilities under the cap and allows covered sources, including producers and consumers of energy, to determine the least expensive strategies to comply. The emissions allowed under the cap will be denominated in metric tons of CO₂e. The currency will be in the form of allowances which the State will issue based upon the total emissions allowed under the cap during any specific compliance period. Emission allowances can be banked for future use, encouraging early reductions and reducing market volatility. The ability to trade allows facilities to adjust to changing conditions and take advantage of reduction opportunities when those opportunities are less expensive than buying additional emissions allowances.

Provisions could be made to allow a limited use of surplus reductions of greenhouse gas emissions that occur outside of the cap. These additional reductions are known as offsets and are discussed further below. In order to be used to meet a source's compliance obligation, offsets will be subject to stringent criteria and verification procedures to ensure their enforceability and consistency with AB 32 requirements.

Appendix C describes the fundamentals of a cap-and-trade program and program design elements. Appendix D contains the WCI Design Recommendations and related background documents.

California Cap-and-Trade Program

By providing a firm cap on 85 percent of the state's greenhouse gas emissions, the cap-and-trade regulatory program is an essential component of the overall plan to meet the 2020 target and provides a robust mechanism to achieve the additional reductions needed by 2050. To meet the emissions reduction target under AB 32, the limit on emissions allowed under the cap, plus emissions from uncapped sources, must be no greater than the 2020 emissions goal.

By setting a limit on the quantity of greenhouse gases emitted, a well-designed cap-and-trade program will complement other measures for entities within covered sectors. Additionally, starting a cap-and-trade program now will set us on a course to achieve further emissions cuts well beyond 2020 and ensure that California is primed to take advantage of opportunities for linking with other programs, including future federal and international efforts.

The proposed cap-and-trade measure phases in the following sectors:

Starting in the first compliance period (2012):

- Electricity generation, including imports not covered by a WCI Partner jurisdiction
- Large industrial facilities that emit over 25,000 metric tons CO₂E per year.

Starting in the second compliance period (2015):

- Upstream treatment of industrial fuel combustion at facilities with emissions at or below 25,000 metric tons CO₂E, and all commercial and residential fuel combustion regulated where the fuel enters into commerce
- Transportation fuel combustion regulated where the fuel enters into commerce.

For some energy-intensive industrial sources such as cement, stringent requirements in California, either through inclusion in a cap-and-trade program or through source-specific regulation, have the potential to create a disadvantage for California facilities relative to out-of-state competitors unless those locations have similar requirements (e.g., through the WCI). If production shifts outside of California in order to operate without being subject to these requirements, emissions could remain unchanged or even increase. This is referred to as "leakage." AB 32 requires ARB to design measures to minimize leakage. Minimizing leakage will be a key consideration when developing the cap-and-trade regulation and the other AB 32 program measures.²²

²² The cement industry is an example of a sector that may be susceptible to this type of leakage, and the Draft Scoping Plan included consideration of a measure to institute an intensity standard at concrete batch plants that would consider this type of life-cycle emissions. ARB will evaluate whether this type of intensity standard could be incorporated into the cap-and-trade program or instituted as a complementary measure during the cap-and-trade rulemaking.

As shown in Table 5, the preliminary estimate of the cap on greenhouse gas emissions for sectors covered by the cap-and-trade program is 365 MMTC02E in 2020, which covers about 85 percent of California's total greenhouse gas emissions.²³ Greenhouse gas emissions from most of the sectors covered by a cap-and-trade program will also be governed by other measures, including performance standards, efficiency programs, and direct regulations. These other measures will provide real reductions which will contribute reductions toward the cap.

In addition, ARB will work closely with the CPUC, CEC, and The California Independent System Operator to ensure that the cap-and-trade program works within the context of the State's energy policy and enables the reliable provision of electricity.

Table 5: Sector Responsibilities Under Cap-and-Trade Program (MMTC02E in 2020)

Sector	Projected 2020 Business-as-Usual Emissions		Preliminary 2020 Emissions Limit under Cap-and-Trade Program
	By Sector	Total	
Transportation	225		
Electricity	139	512	365
Commercial and Residential	47		
Industry	101		

Linkage with the Western Climate Initiative Partner Jurisdictions

The WCI was formed in 2007. Members are California, Arizona, New Mexico, Oregon, Washington, Utah, and Montana, and the Canadian provinces of British-Columbia, Manitoba, Ontario, and Quebec. The WCI Partner jurisdictions, including California, have adopted goals to reduce greenhouse gas emissions that, in total, reduce regional emissions to 15 percent below 2005 levels by 2020. This regional goal is approximately equal to California's goal of returning to 1990 levels by 2020. A cap-and-trade program is one element of the effort by the WCI Partner jurisdictions to identify, evaluate, and implement ways to reduce greenhouse gas emissions and achieve related co-benefits.

The WCI Partner jurisdictions released their recommendation for the design of a regional cap-and-trade program in September 2008. This design document and the

²³ The actual cap for the program will be established as part of the rulemaking process. The preliminary cap of 365 MMTC0₂E in 2020 assumes that all of California's electricity imports would be covered under a California cap. Because a significant portion of California's imported electricity is from power plants located in other WCI Partner Jurisdictions, emissions from those sources could be included in the cap of the states within which the power plants are located. In establishing the California cap, ARB will need to consider the degree to which emissions from these sources are addressed as part of the WCI regional market.

background paper that accompanied it are presented in Appendix D. These recommendations were developed collaboratively by the WCI Partner jurisdictions, including California, with a goal of achieving regional targets to reduce greenhouse gas emissions equitably and effectively. The WCI Partner jurisdictions' recommendations are generally consistent with the recommendations provided in June 2007 by the California Market Advisory Committee,²⁴ the recommendations provided to ARB by the California Public Utilities Commission and the California Energy Commission in March 2008,²⁵ and the proposed opinion released by the two Commissions in September 2008.²⁶

Participating in a regional system has several advantages for California. The reduction of greenhouse gas emissions that can be achieved collectively by the WCI Partner jurisdictions are approximately double what can be achieved through a California-only program. The broad scope of a WCI-wide market will provide additional opportunities for reduction of emissions, therefore providing greater market liquidity and more stable carbon prices within the program. The regional system also significantly reduces the potential for leakage, which is a shift in economic and emissions activity out of California that could hurt the state's economy without reducing global greenhouse gas emissions. Harmonizing the approach and timing of California's requirements for reducing greenhouse gas emissions with other states and provinces in the region can encourage retention of local businesses in the state. Further, by creating a cost-effective regional market system, California and the other WCI Partner jurisdictions will continue to demonstrate leadership in preparation for future federal and international climate action.

To achieve the individual WCI Partner jurisdiction goals and the regional goal, each WCI Partner jurisdiction will have an allowance budget based on its goal that declines to 2020. For example, California's allowance budget will be based on the level of emissions needed to achieve the AB 32 target for 2020, as described above. Once California links with the other WCI Partner jurisdictions, allowances could be traded across state and provincial boundaries. As a result of trading, emissions in a

²⁴ Recommendations of the Market Advisory Committee to the California Air Resources Board. *Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California*. June 30, 2007. p. 19. http://www.climatechange.ca.gov/publications/market_advisory_committee/2007-06-29_MAC_FINAL_REPORT.PDF (accessed October 12, 2008) CalEPA The Market Advisory Committee (MAC) consisted of a consortium of economists, policy makers, academics, government representatives, and environmental advocates who came together through the auspices of CalEPA, pursuant to Executive Order S-20-06 from Governor Schwarzenegger.

²⁵ Joint Agency Decision of the CEC and the CPUC. *Final Adopted Interim Decision on Basic Greenhouse Gas Regulatory Framework for Electricity and Natural Gas Sectors*, March 13, 2008. Document number CEC-100-2008-002-F. <http://www.energy.ca.gov/2008publications/CEC-100-2008-002/CEC-100-2008-002-F.PDF> (accessed October 12, 2008)

²⁶ Joint Agency proposed final opinion of the CEC and the CPUC. *Proposed Final Opinion on Greenhouse Gas Regulatory Strategies*. Published September 12, 2008 and to be considered for adoption on October 16, 2008 by the CEC and the CPUC. Document Number CEC-100-2008-007-D http://www.energy.ca.gov/ghg_emissions/index.html (accessed October 12, 2008)

state may vary from its allowance budget, although total regional emissions will not exceed the regional cap.

The overall number of allowances issued in a given year by the WCI Partner jurisdictions will set a limit on emissions from sectors covered by the program for the region. Details of distribution of allowances will be established by each partner within the general guidelines set forth in the WCI program design framework. The WCI Partner jurisdictions have agreed to consider standardizing allowance distribution across specific sectors if necessary to address competitiveness issues. In addition, the WCI Partner jurisdictions have agreed to phase in regionally coordinated auctions of allowances, with a minimum percentage of allowances auctioned in each period starting with 10 percent in the first compliance period and increasing to 25 percent in 2020. WCI partners aspire to reach higher auction percentages over time, possibly to 100 percent. Under the program design, each WCI Partner jurisdiction, including California, can auction a greater portion of its allowance budget in any compliance period. The distribution of California's allowances will be determined during the cap-and-trade rulemaking process, as discussed below.

The WCI Partner jurisdictions are also proposing the use of an allowance reserve price for the first 5 percent of the auctioned allowances in the regional cap. A reserve price will help to ensure that the cap is set at a level that will motivate real emissions reductions and may provide an opportunity for the regional cap-and-trade program to provide reductions that exceed the regional target.

A regional coordinated cap-and-trade program with strong reporting and enforcement rules will provide a high degree of certainty that emissions will not exceed targeted levels and that leakage will not occur.

Federal Action

A cap-and-trade program is expected to be a significant element in any future federal action taken to reduce greenhouse gas emissions. ARB's efforts to design a broad cap-and-trade system that works in concert with sector- or source-related measures and meets the requirements of AB 32 can serve as a model for a federal program. An effective, enforceable regional cap-and-trade program can promote the type of federal legislation needed to meet the pressing challenge of climate change. In the event that California businesses, organizations, or individuals hold regional allowances when a federal system is implemented, California will work to ensure that those allowances continue to have value, either in a continuing regional program or within the federal program.

Cap-and-Trade Rulemaking

To implement the cap-and-trade program, ARB will embark on regulatory development that includes extensive and broad-based public participation. Major program design elements will include setting an emissions cap in conjunction with the WCI Partner jurisdictions, determining the method of distributing both allowances.

and revenues raised through auctions, and establishing the rules for the use of offsets. ARB will continue to work with all affected stakeholders, State and local agencies, and our WCI partners to create a robust regional market system.

After adoption of the Scoping Plan, ARB will establish a formal structure to elicit ongoing participation in the rulemaking process from a wide range of affected stakeholders. While the process will be open to involvement by all interested parties, ARB anticipates creation of a series of focused working groups that include participation by representatives of the regulated community, environmental and community advocates and other public interest groups, prominent academics with expertise in cap-and-trade issues and new technology development, local air pollution control districts, stakeholders in the WCI, and other State agencies with existing authority for regulating capped sectors.

This process will integrate economic and administrative design considerations and include consideration of environmental and public health issues. ARB will convene a series of technical workshops to examine mechanisms to address the concerns related to the cap-and-trade program raised by the Environmental Justice Advisory Committee and other stakeholders. The first workshop will explore cap-and-trade program design options that could provide incentives to maximize additional environmental and economic benefits, and to analyze the proposed program to prevent increases in emissions of toxic air contaminants or criteria pollutants through the design and architecture of the program itself. Similar technical workshops will focus on issues related to offsets and the WCI proposal.

Allowances and Revenues

Emission allowances represent a significant economic value whether they are freely allocated or sold through auction. Section E includes a preliminary discussion of some of the options that have been suggested for use of allowance value or revenues. ARB will evaluate the possible uses of allowances or revenues as part of the rulemaking process. One approach would be to dedicate a portion of the allowances for such purposes as rewarding early actions to reduce emissions, providing incentives for local governments and others to promote energy efficiency, better land use planning, and other reduction strategies, and targeting projects to reduce emissions in low-income or disadvantaged communities. This type of dedicated use of allowances is typically referred to as an allowance 'set-aside.'

The California Public Utilities Commission and the California Energy Commission addressed the question of allocation and auction of allowances in their joint proceeding on implementation of AB 32 for the Electricity and Natural Gas sectors. They have recently released a proposed opinion that recommends to ARB a transition to 100 percent auction for the Electricity sector by 2016.²⁷ The CPUC and CEC

²⁷ Op. Cit. The proposed opinion has not yet been voted on by either the CPUC or the CEC. The Commissions are expected to vote on this proposed opinion before the December Board meeting when the Proposed Scoping Plan will be considered for approval.

included in their draft opinion the recommendation that all auction revenues be used for purposes related to AB 32, and all revenue from allowances allocated to the Electricity sector and received by retail providers would be used for the benefit of the Electricity sector to support investments in renewable energy, efficiency, new energy technology, infrastructure, customer bill relief, and other similar programs.

The Market Advisory Committee also recommended the eventual transition to full auction within the cap-and-trade program, noting that a system in which California ultimately auctions all of its emission allowances is consistent with fundamental objectives of cost-effectiveness, fairness and simplicity.²⁸ ARB agrees that a transition to a 100 percent auction is a worthwhile goal for distributing allowances. However a broad set of factors must be considered in evaluating the potential timing of a transition to a full auction including competitiveness, potential for emissions leakage, the effect on regulated vs. unregulated industrial sectors, the overall impact on consumers, and the strategic use of auction revenues.

Allowance allocation and revenue use decisions can greatly affect the equity of a cap-and-trade system. Addressing both these issues will be a major part of the rulemaking process. ARB will seek input from a broad range of experts in an open public process regarding the options for allocation and revenue use under consideration by ARB and the WCI Partner jurisdictions. This process will evaluate various mechanisms ARB is considering for allowance distribution and potential uses of allowance value, including the recommendations offered by CPUC and CEC. Issues to be considered will include the appropriate timing and structure of a transition to full auction of allowances, the potential need to harmonize the allocation process regionally for certain sectors subject to inter-state competition, and equity across the various sectors here in California.

Offsets

Individual projects can be developed to achieve the reduction of emissions from activities not otherwise regulated, covered under an emissions cap, or resulting from government incentives. These projects can generate "offsets," i.e., verifiable reductions of emissions whose ownership can be transferred to others. The cap-and-trade rulemaking will establish appropriate rules for use of offsets. As required by AB 32, any reduction of greenhouse gas emissions used for compliance purposes must be real, permanent, quantifiable, verifiable, enforceable, and additional (HSC §38562(d)(1) and (2)). Offsets used to meet regulatory requirements must be quantified according to Board-adopted methodologies, and ARB must adopt a regulation to verify and enforce the reductions (HSC §38571). The criteria developed will ensure that the reductions are quantified accurately and are not double-counted within the system.

²⁸Recommendations of the Market Advisory Committee to the California Air Resources Board. *Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California*. June 30, 2007. p.55. http://www.climatechange.ca.gov/publications/market_advisory_committee/2007-06-29_MAC_FINAL_REPORT.PDF (accessed October 12, 2008)

Offsets can provide regulated entities a source of low-cost emissions reductions. Reductions from compliance offset projects must be quantified using rigorous measurement and enforcement protocols that provide a basis to determine whether the reductions are also additional, i.e., beyond what would have happened in the absence of the offset project. Establishing that reductions are additional is one of the major challenges in establishing the validity of particular offset projects. Once a project can quantify emissions using an approved methodology, the reductions of emissions must be verified to ensure that reductions actually occurred.

While some offsets provide benefits, allowing unlimited offsets would reduce the amount of reductions of greenhouse gas emissions occurring within the sectors covered by the cap-and-trade program. This could reduce the local economic, environmental and public health co-benefits and delay the transition to low-carbon energy systems within the capped sectors that will be necessary to meet our long term climate goals. The limit on the use of offsets and allowances from other systems within the WCI Partner jurisdiction program design assures that a majority of the emissions reductions required from 2012 to 2020 occur at entities and facilities covered by the cap and trade program. Consequently, the use of offsets and allowances from other systems are limited to no more than 49 percent of the required reduction of emissions. This quantitative limit will help provide balance between the need to achieve meaningful emissions reductions from capped sources with the need to provide sources within capped sectors the opportunity for low-cost reduction opportunities that offsets can provide. The WCI offset program may incorporate flexibility to use offsets and non-WCI allowances across the three compliance periods, which each WCI Partner jurisdiction could use at its discretion. ARB will apply the limit on offsets that is within its jurisdiction, such that the allowable offsets in each compliance period is less than half of the emissions reductions expected from capped sectors in that compliance period. Each WCI Partner jurisdiction may choose to adopt a more stringent limit on the use of offsets and non-WCI allowances.

Offsets can also encourage the spread of clean, low carbon technologies outside California. High quality offset projects located outside the state can help lower the compliance costs for regulated entities in California, while reducing greenhouse gas emissions in areas that would otherwise lack the resources needed to do so. International projects may also have significant environmental, economic and social benefits. Projects in the Mexican border region may be of particular interest, considering the opportunity to realize considerable co-benefits on both sides of the border. The Governor has recently signed a Memorandum of Understanding with the six Mexican border states that calls for cooperation on the development of project protocols for Mexican greenhouse gas emissions reduction projects.²⁹ Additionally,

²⁹ Memorandum of Understanding on Environmental Cooperation between the California Environmental Protection Agency, the California Department of Food and Agriculture and the California Resources Agency of the State of California, United States of America and the Ministry of Environment and Natural Resources of the United Mexican States. February 13, 2008. http://gov.ca.gov/pdf/press/021308_MOU_English.pdf (accessed October 12, 2008)

defining project types related to imported commodities (such as cement) would enable California to provide incentives to reduce emissions associated with products that are imported into the state for our consumption.

California is committed to working at the international level to reduce greenhouse gas emissions globally and finding ways to support the adoption of low-carbon technologies and sustainable development in the developing world. ARB will work with WCI Partner jurisdictions and within the rulemaking process to establish an offsets program without geographic restrictions that includes sufficiently stringent criteria for creating offset credits to ensure the overall environmental integrity of the program.

One concept being evaluated for accepting offsets from the developing world is to limit offsets to those jurisdictions that demonstrate performance in reducing emissions and/or achieving greenhouse gas intensity targets in certain carbon intensive sectors (e.g., cement), or in reducing emissions or enhancing sequestration through eligible forest carbon activities in accordance with appropriate national or sub-national accounting frameworks. This could be achieved through an agreement to work jointly to develop minimum performance standards or sectoral benchmarks, backed by appropriate monitoring and accounting frameworks. Such agreements would encourage early action in developing countries toward binding commitments, and could also reduce concerns about competitiveness and risks associated with carbon leakage.

2. California Light-Duty Vehicle Greenhouse Gas Standards

Implement adopted Pavley standards and planned second phase of the program. Align zero-emission vehicle, alternative and renewable fuel and vehicle technology programs with long-term climate change goals.

Passenger vehicles are responsible for almost 30 percent of California's greenhouse gas emissions. To address these emissions; ARB is proposing a comprehensive three-prong strategy - reducing greenhouse gas emissions from vehicles, reducing the carbon content of the fuel these vehicles burn, and reducing the miles these vehicles travel. Transportation fuels and regional transportation-related greenhouse gas targets are discussed later in the recommendations.

There are a number of efforts intended to reduce greenhouse gas emissions from California's passenger vehicles, including the Pavley greenhouse gas vehicle standards to achieve near-term emission reductions, the zero-emission vehicle (ZEV) program to transform the future vehicle fleet, and the Alternative and Renewable Fuel and Vehicle Technology Program created by AB 118 (Nunez, Chapter 750, Statutes of 2007).

Pavley Greenhouse Gas Vehicle Standards

AB 1493 (Pavley, Chapter 200, Statutes of 2002) directed ARB to adopt vehicle standards that lowered greenhouse gas emissions to the maximum extent technologically feasible, beginning with the 2009 model year. ARB adopted regulations in 2004 and applied to the U.S. Environmental Protection Agency (U.S. EPA) for a waiver under the federal Clean Air Act to implement the regulation. The Pavley regulations incorporate both performance standards and market-based compliance mechanisms. To obtain additional reductions from the light duty fleet, ARB plans to adopt a second, more stringent, phase of the Pavley regulations. Table 6 summarizes the estimated reduction of emissions for the Pavley regulations. In addition to delivering greenhouse gas emissions reductions, the standards will save money for Californians who purchase vehicles that comply with the Pavley standards - an estimated average of \$30 each month in avoided fuel costs.

To date, 13 other states have adopted California's existing greenhouse gas standards for vehicles. Under federal law, California is the only state allowed to adopt its own vehicle standards (though other states are permitted to adopt California's more rigorous standards), but California cannot implement the regulations until U.S. EPA grants an administrative waiver. In December 2007, U.S. EPA denied California's waiver request to implement the Pavley regulations. California and others are challenging that denial in Federal court. The regulations have also been challenged by the automakers in federal courts, although to date, those challenges have been unsuccessful.

ARB is evaluating the use of feebates as a measure to achieve additional reductions from the mobile source sector, either as a backstop to the Pavley regulation if the regulation cannot be implemented, or as a supplement to Pavley if the waiver is approved and the regulation takes effect. AB 32 specifically states that if the Pavley regulations do not remain in effect, ARB shall implement alternative regulations to control mobile sources to achieve equivalent or greater reductions of greenhouse gas emissions (HSC §38590). ARB is currently evaluating the use of a feebate program as the mechanism to secure these reductions. A feebate regulation would combine a rebate program for low-emitting vehicles with a fee program for high-emitting vehicles. This program would be designed in a way to generate equivalent or greater cumulative reductions of greenhouse gas emissions compared to what would have been achieved under the Pavley regulations. ARB would also evaluate the potential to expand the program to include additional vehicle classes not currently included in the Pavley program for further greenhouse gas benefits.

If the U.S. EPA grants California's request for a waiver to proceed with implementation of the Pavley regulations, we will analyze the potential for pursuing a feebate program that could complement the Pavley regulations and achieve additional reductions of greenhouse gas emissions.

Zero-Emission Vehicle Program

The Zero Emission Vehicle (ZEV) program will play an important role in helping California meet its 2020 and 2050 greenhouse gas emissions reduction requirements. Through 2012, the program requires placement of hundreds of ZEVs (including hydrogen fuel cell and battery electric vehicles) and thousands of near-zero emission vehicles (plug-in hybrids, conventional hybrids, compressed natural gas vehicles). In the mid-term (2012-2015), the program will require placement of increasing numbers of ZEVs and near-zero emission vehicles in California. In 2009, the Board will consider a proposal that is currently being developed to ensure that the ZEV program is optimally designed to help the State meet its 2020 target and put us on the path to meeting our 2050 target of an 80 percent reduction in greenhouse gas emissions.

It is important to note that while the use of both battery-powered electric vehicles and plug-in hybrids (which can be plugged in to recharge batteries) is not expected to increase electricity demand in the near term, over the longer term these technologies could result in meaningful new electricity demand. However, the expected increased electricity demand is likely to be met by off peak vehicle battery charging (i.e., overnight) to provide a means of load leveling and other possible benefits.³⁰

Air Quality Improvement Program/Alternative and Renewable Fuel and Vehicle Technology Program

Under AB 118 (Nufiez, Chapter 750, Statutes of 2007), ARB is administering the Air Quality Improvement Program, which provides approximately \$50 million per year for grants to fund clean vehicle/equipment projects and research on the air quality impacts of alternative fuels and advanced technology vehicles.

AB 118 also created the Alternative and Renewable Fuel and Vehicle Technology Program and authorized CEC to spend up to \$120 million per year for over seven years (from 2008-2015) to develop, demonstrate, and deploy innovative technologies to transform California's fuel and vehicle types. This program creates the opportunities for investment in technologies and fuels that will help meet the Low Carbon Fuel Standard, the AB 1007 (Pavley, Chapter 371, Statutes of 2005) goal of increasing alternative fuels, the AB 32 goal of reducing greenhouse gas emissions to 1990 levels by 2020, and the State's overall goal of reducing greenhouse gas emissions 80 percent below 1990 levels by 2050. CEC and ARB are coordinating closely in the implementation of AB 118. In the long-term, programs to reduce greenhouse gas emissions from cars would reduce highway funds because less fuel would be sold, reducing tax revenue. In coordination with other State agencies, ARB will continue to evaluate the potential impacts of these shifts and identify potential solutions.

³⁰ There is also a potential for battery-electric and hybrid vehicles (both plug-in and traditional hybrid-electric) to be used in the future to provide electricity back into the electricity grid during times of especially high demand (peak periods).

Table 6: California Light-Duty Vehicle Greenhouse Gas Standards Recommendation (MMTC02E in 2020)

Measure No.	Measure Description	Reductions
T-1	Pavley I and II - Light-Duty Vehicle Greenhouse Gas Standards	31.7
Total		31.7

3. Energy Efficiency

Maximize energy efficiency building and appliance standards, and pursue additional efficiency efforts including new technologies, and new policy and implementation mechanisms. Pursue comparable investment in energy efficiency from all retail providers of electricity in California (including both investor-owned and publicly-owned utilities).

Energy-efficiency measures for both electricity and natural gas can reduce greenhouse gas emissions significantly. In 2003, the CPUC and CEC adopted an Energy Action Plan that prioritized resources for meeting California's future energy needs, with energy efficiency being first in the "loading order," or highest priority. Since then, this policy goal has been codified into statute through legislation that requires electric utilities to meet their resource needs first with energy efficiency.³¹

This measure would set new targets for statewide annual energy demand reductions of 32,000 gigawatt hours and 800 million therms from business as usual³² - enough to power more than 5 million homes, or replace the need to build about ten new large power plants (500 megawatts each). These targets represent a higher goal than existing efficiency targets established by CPUC for the investor-owned utilities due to the inclusion of innovative strategies above traditional utility programs. Achieving the State's energy efficiency targets will require coordinated efforts from the State, the federal government, energy companies and customers. ARB will work with CEC and CPUC to facilitate these partnerships. A number of these measures also have the potential to deliver significant economic benefits to California consumers, including low-income households and small businesses. California's energy efficiency programs for buildings and appliances have generated more than \$50 billion in savings over the past three decades. Tables 7 and 8 summarize the reduction of greenhouse gas emissions.

³¹ SB 1037 (Kehoe, Chapter 366, Statutes of 2005) and AB 2021 (Levine, Chapter 734, Statutes of 2006) directed electricity corporations subject to CPUC's authority and publicly-owned electricity utilities to first meet their unmet resource needs through all available energy efficiency and demand response resources that are cost effective, reliable and feasible.

³² The savings targeted here are additional to savings currently assumed to be incorporated in CEC's 2007 demand forecasts. However, CEC has initiated a public process to better determine the quantity of energy savings from standards, utility programs, and market effects that are embedded in the baseline demand forecast.

Efficiency

Achieving the energy efficiency target will require redoubled efforts to target industrial, agricultural, commercial, and residential end-use sectors, comprised of both innovative new initiatives that have been embraced by CEC's energy policy reports and CPUC's long-term strategic plan, and improvements to California's traditional approaches of improved building standards and utility programs.

High-efficiency distributed generation applications like fuel cell technologies can also play an important role in helping the State meet its requirements for reduction of greenhouse gas emissions. Key energy efficiency strategies, grouped by type, include:

Cross-cutting Strategy for Buildings

- "Zero Net Energy" buildings³³

Codes and Standards Strategies

- More stringent building codes and appliance efficiency standards
- Broader standards for new types of appliances and for water efficiency
- Improved compliance and enforcement of existing standards
- Voluntary efficiency and green building targets beyond mandatory codes

Strategies for Existing Buildings

- Voluntary and mandatory whole-building retrofits for existing buildings
- Innovative financing to overcome first-cost and split incentives forenergy efficiency, on-site, renewables, and high efficiency distributed generation

Existing and Improved Utility Programs

- More aggressive utility programs to achieve long-term savings

Other Needed Strategies

- Water system and water use efficiency and conservation measures
- Local government programs that lead by example and tap into local authority over planning, development, and code compliance
- Additional industrial and agricultural efficiency initiatives
- Providing real time energy information technologies to help consumers conserve and optimize energy performance

With the support of key State agencies, utilities, local governments and others, the CPUC has recently adopted the *California Long Term Energy Efficiency Strategic Plan*.³⁴ Released September 2008, this Plan sets forth a set of strategies toward maximizing the achievement of cost-effective energy efficiency in California's Electricity and Natural Gas sectors between 2009 and 2020, and beyond. Its

³³ Zero net energy refers to building energy use over the course of a typical year. When the building is producing more electricity than it needs, it exports its surplus to the grid. When the building requires more electricity than is being produced on-site, it draws from the grid. Generally, when constructing a ZNE building, energy efficiency measures can result in up to 70% savings relative to existing building practices, which then allows for renewables to meet the remaining load.

³⁴ California Public Utilities Commission. *California Long Term Energy Efficiency Strategic Plan*. September 2008. <http://www.californiaenergyefficiency.com/docs/IEEStrategicPlan.pdf> (accessed October 12, 2008).

recommendations are the result of a year-long collaboration by energy experts, utilities, businesses, consumer groups, and governmental organizations in California, throughout the west, nationally and internationally.

For many of the above goals and others, the Strategic Plan discusses practical implementation strategies, detailing necessary partnerships among the state, its utilities, the private sector, and other market players and timelines for near-term, mid-term and long-term success. While the Strategic Plan is the most current and innovative summary of energy efficiency strategies needed to meet State goals, additional planning and new strategies will likely be needed, both to achieve the 2020 emissions reduction goals and to set the State on a trajectory toward 2050.

Other innovative approaches could also be used to motivate private investment in efficiency improvements. One example that will be evaluated during the development of the cap-and-trade program is the creation of a mechanism to make allowances available within the program to provide incentives for local governments, third party providers, or others to pursue projects to reduce greenhouse gas emissions, including the bundling of energy efficiency improvements for small businesses or in targeted communities.

Solar Water Heating

Solar water heating systems offer a potential for natural gas savings in California. A solar water heating system offsets the use of natural gas by using the sun to heat water, typically reducing the need for conventional water heating by about two-thirds. Successful implementation of the zero net energy target for new buildings will require significant growth in California's solar water heating system manufacturing and installation industry. The State has initiated a program to move toward a self-sustaining solar water heater industry. The Solar Hot Water and Efficiency Act of 2007 (SHWEA) authorized a ten year, \$250-million incentive program for solar water heaters with a goal of promoting the installation of 200,000 systems in California by 2017.³⁵

Combined Heat and Power

Combined heat and power (CHP), also referred to as cogeneration, produces electricity and useful thermal energy in an integrated system. The widespread development of efficient CHP systems would help displace the need to develop new, or expand existing, power plants. This measure sets a target of an additional 4,000 MW of installed CHP capacity by 2020, enough to displace approximately 30,000 GWh of demand from other power generation sources.³⁶

³⁵ Established under Assembly Bill 1470 (Huffman, Chapter 536, Statutes of 2007).

³⁶ Accounting for avoided transmission line losses of seven percent, this amount of CHP would actually displace 32,000 GWh from the grid.

California has supported CHP for many years, but market and other barriers continue to keep CHP from reaching its full market potential. Increasing the deployment of efficient CHP will require a multi-pronged approach that includes addressing significant barriers and instituting incentives or mandates where appropriate. These approaches could include such options as utility-provided incentive payments, the creation of a CIIP portfolio standard, transmission and distribution support payments, or the use of feed-in tariffs.

**Table 7: Energy Efficiency Recommendation - Electricity
(MMTC02E in 2020)**

Measure No.	Measure Description	Reductions
Energy Efficiency (32,000 GWh of Reduced Demand)		
E-1	<ul style="list-style-type: none"> • Increased Utility Energy Efficiency Programs • More Stringent Building & Appliance Standards • Additional Efficiency and Conservation Programs 	15.2
E-2	Increase Combined Heat and Power Use by 30,000 GWh	6.7
Total		21.9

**Table 8: Energy Efficiency Recommendation - Commercial and Residential
(MMTC02E in 2020)**

Measure No.	Measure Description	Reductions
Energy Efficiency (800 Million Therms Reduced Consumption)		
CR-1	<ul style="list-style-type: none"> • Utility Energy Efficiency Programs • Building and Appliance Standards • Additional Efficiency and Conservation Programs 	4.3
CR-2	Solar Water Heating (AB 1470 goal)	0.1
Total		4.4

4. Renewables Portfolio Standard

Achieve 33 percent renewable energy mix statewide.

CEC estimates that about 12 percent of California's retail electric load is currently met with renewable resources. Renewable energy includes (but is not limited to) wind, solar, geothermal, small hydroelectric, biomass, anaerobic digestion, and landfill gas. California's current Renewables Portfolio Standard (RPS) is intended to increase that share to 20 percent by 2010. Increased use of renewables will decrease California's reliance on fossil fuels, thus reducing emissions of greenhouse gases from the Electricity sector. Based on Governor Schwarzenegger's call for a statewide 33 percent RPS, the Plan anticipates that California will have 33 percent of its electricity provided by renewable resources by 2020, and includes the reduction of greenhouse gas emissions based on this level.

Senate Bill 107 (Simitian, Chapter 464, Statutes of 2006) obligates the investor-owned utilities (IOUs) to increase the share of renewables in their electricity portfolios to 20 percent by 2010. Meanwhile, the publicly-owned utilities (POUs) are encouraged but not required to meet the same RPS. The governing boards of the state's three largest POUs, the Los Angeles Department of Water and Power (LADWP), the Sacramento Municipal Utility District (SMUD), and the Imperial Irrigation District (IID), have adopted policies to achieve 20 percent renewables by 2010 or 2011. LADWP and IID have established targets of 35 and 30 percent, respectively, by 2020.

In 2005, CEC and CPUC committed in the Energy Action Plan II to "evaluate and develop implementation paths for achieving renewable resource goals beyond 2010, including 33 percent renewables by 2020, in light of cost-benefit and risk analysis, for all load serving entities." The proposed opinion in the CPUC/CEC joint proceeding lends strong support for obtaining 33 percent of California's electricity from renewables, and states the two Commissions' belief that this target is achievable if the State commits to significant investments in transmission infrastructure and key program augmentation. As with the energy efficiency target, achieving the 33 percent goal will require broad-based participation from many parties and the removal of barriers. CEC, CPUC, California Independent System Operator (CAISO), and ARB are working with California utilities and other stakeholders to formally establish and meet this goal.

A key prerequisite to reaching a target of 33 percent renewables will be to provide sufficient electric transmission lines to renewable resource zones and system changes to allow integration of large quantities of intermittent wind and solar generation. The Renewable Energy Transmission Initiative (RETI) is a broad collaborative of State agencies, utilities, the environmental community, and renewable generation developers that are working cooperatively to identify and prioritize renewable generation zones and associated transmission projects. Although biomass, geothermal, and small-scale hydroelectric generation can provide steady baseload power, other renewable generation is intermittent (wind) or varies over time (solar). Therefore, integration of intermittent generation into the electricity system will require grid improvements so that fluctuations in power availability can be accommodated. Improved communications technology, automated demand response, electric sub-station improvements and other modern technologies must be implemented both to facilitate intermittent renewables, and to improve grid reliability.

Another key action that may help to achieve the renewable energy goals is to reduce the complexity and cost faced by small renewable developers in contracting with utilities to supply renewable generation. This is particularly important for projects offering below 20 megawatts of generation capacity. One such option may be a feed-in tariff for all RPS-eligible renewable energy facilities up to 20 megawatts in size. This mechanism was recommended in CEC's 2007 Integrated Energy Policy Report. Such a tariff, set at an appropriate level, could benefit small-scale facilities by allowing them to be brought into the electricity grid more rapidly.

For the purposes of calculating the reduction of greenhouse gas emissions in this Proposed Scoping Plan, ARB is counting emissions avoided by increasing the percentage of renewables in California's electricity mix from the current level of 12 percent to the 33 percent goal, as shown in Table 9.

**Table 9: Renewables Portfolio Standard Recommendation
(MMTC02E in 2020)**

Measure No.	Measure Description	Reductions
E-3	Achieve a 33% renewables mix by 2020	21.3
Total		21.3

5. Low Carbon Fuel Standard

Develop and adopt the Low Carbon Fuel Standard.

Because transportation is the largest single source of greenhouse gas emissions in California, the State is taking an integrated approach to reducing emissions from this sector. Beyond including vehicle efficiency improvements and lowering vehicle miles traveled, the State is proposing to reduce the carbon intensity of transportation fuels consumed in California.

To reduce the carbon intensity of transportation fuels, ARB is developing a Low Carbon Fuel Standard (LCFS), which would reduce the carbon intensity of California's transportation fuels by at least ten percent by 2020 as called for by Governor Schwarzenegger in Executive Order S-01-07.

LCFS will incorporate compliance mechanisms that provide flexibility to fuel providers in how they meet the requirements to reduce greenhouse gas emissions. The LCFS will examine the full fuel cycle impacts of transportation fuels and ARB will work to design the regulation in a way that most effectively addresses the issues raised by the Environmental Justice Advisory Committee and other stakeholders. ARB identified the LCFS as a Discrete Early Action item, and is developing a regulation for Board consideration in March 2009. A 10 percent reduction in the intensity of transportation fuels is expected to equate to a reduction of 16.5 MMTCO₂E in 2020. However, in order to account for possible overlap of benefits between LCFS and the Pavley greenhouse gas standards, ARB has discounted the contribution of LCFS to 15 MMTCO₂E.

**Table 10: Low Carbon Fuel Standard Recommendation
(MMTC02E in 2020)**

Measure No.	Measure Description	Reductions
T-2	Low Carbon Fuel Standard (Discrete Early Action)	15
Total		15

6. Regional Transportation-Related Greenhouse Gas Targets

Develop regional greenhouse gas emissions reduction targets for passenger vehicles.

Establishment of Regional Targets

On September 30, 2008, Governor Arnold Schwarzenegger signed Senate Bill 375 (Steinberg) which establishes mechanisms for the development of regional targets for reducing passenger vehicle greenhouse gas emissions. Through the SB 375 process, regions will work to integrate development patterns and the transportation network in a way that achieves the reduction of greenhouse gas emissions while meeting housing needs and other regional planning objectives. This new law reflects the importance of achieving significant additional reductions of greenhouse gas emissions from changed land use patterns and improved transportation to help achieve the goals of AB 32.

SB 375 requires ARB to develop, in consultation with metropolitan planning organizations (MPOs), passenger vehicle greenhouse gas emissions reduction targets for 2020 and 2035 by September 30, 2010. It sets forth a collaborative process to establish these targets, including the appointment by ARB of a Regional Targets Advisory Committee to recommend factors to be considered and methodologies for setting greenhouse gas emissions reduction targets. SB 375 also provides incentives - relief from certain California Environmental Quality Act (CEQA) requirements for development projects that are consistent with regional plans that achieve the targets.

Reaching the Targets

Transportation planning is done on a regional level in major urban areas, through the Metropolitan Planning Organizations. These MPOs are required by the federal government to prepare regional transportation plans (RTPs) in order to receive federal transportation dollars. These plans must reflect the land uses called out in city and county general plans. Regional planning efforts provide an opportunity for community residents to help select future growth scenarios that lead to more sustainable and energy efficient communities. Such plans should be developed through an extensive public process to provide for local accountability.

SB 375 requires MPOs to prepare a sustainable communities strategy to reach the regional target provided by ARB. MPOs would use the sustainable communities strategy for the land use pattern underlying the region's transportation plan. If the strategy does not meet the target, the MPO must document the impediments and show how the target could be met with an alternative planning strategy. The CEQA relief

would be provided to those projects that are consistent with either the sustainable communities strategy or alternative planning strategy, whichever meets the target.

Many regions in California have conducted comprehensive scenario planning, called Blueprint planning, that engages a broad set of stakeholders at the local level on the impacts of land use and transportation choices. The State has allocated resources to initiate or augment existing Blueprint efforts of MPOs. These efforts focus on fostering efficient land use patterns that not only reduce vehicle travel but also accommodate an adequate supply of housing, reduce impacts on valuable habitat and productive farmland, increase resource use efficiency, and promote a prosperous regional economy. Blueprint planning can play an important role in the SB 375 process by helping inform target-setting efforts and building strong sustainable communities strategies.

Local governments will play a significant role in the regional planning process to reach passenger vehicle greenhouse gas emissions reduction targets. Local governments have the ability to directly influence both the siting and design of new residential and commercial developments in a way that reduces greenhouse gases associated with vehicle travel, as well as energy, water, and waste. A partnership of local and regional agencies is needed to create a sustainable vision for the future that accommodates population growth in a carbon efficient way while meeting housing needs and other planning goals. Integration of the sustainable communities strategies or alternative planning strategies with local general plans will be key to the achievement of these goals. State, regional, and local agencies must work together to prioritize and create the supporting policies, programs, incentives, guidance, and funding to assist local actions to help ensure regional targets are met.

Enhanced public transit service combined with incentives for land use development that provides a better market for public transit will play an important role in helping to reach regional targets.

SB 375 maintains regions' flexibility in the development of sustainable communities strategies. There are many different ways regions can plan and work toward reducing the growth in vehicle travel. Increasing low-carbon travel choices (public transit, carpooling, walking and biking) combined with land use patterns and infrastructure that support these low-carbon modes of travel, can decrease average vehicle trip lengths by bringing more people closer to more destinations. The need for integrated strategies is supported by the current transportation and land use modeling literature.

Supporting measures that should be considered in both the regional target-setting and sustainable communities strategy processes include the following:

- Congestion pricing strategies can provide a method of efficiently managing traffic demand while raising funds for needed transit, biking and pedestrian infrastructure investment. Regional and local agencies, however, do not have the authority to pursue these strategies on their own, as federal approval and State

authorization must be provided for regional implementation of most pricing measures.

- Indirect source rules for new development have already been implemented by some local air districts and proposed by others for purposes of criteria pollution reduction. Regions should evaluate the need for measures that would ensure the mitigation of high carbon footprint development outside of the sustainable communities strategies or alternative planning strategies that meet the targets established under SB 375.
- Programs to reduce vehicle trips while preserving personal mobility, such as employee transit incentives, telework programs, car sharing, parking policies, public education programs and other strategies that enhance and complement land use and transit strategies can be implemented and coordinated by regional and local agencies and stakeholder groups.

Another way to encourage greenhouse gas reductions from vehicle travel is through pay as you drive insurance (PAYD), a structure in which drivers realize a direct financial benefit from driving less. The California Insurance Commissioner recently announced support for PAYD and has proposed regulations to permit PAYD on a voluntary basis.

Separate emissions reduction estimates for these strategies are not quantified here. As regional targets are developed in the SB 375 process, ARB will work with regions to quantify the benefits in the context of the targets.

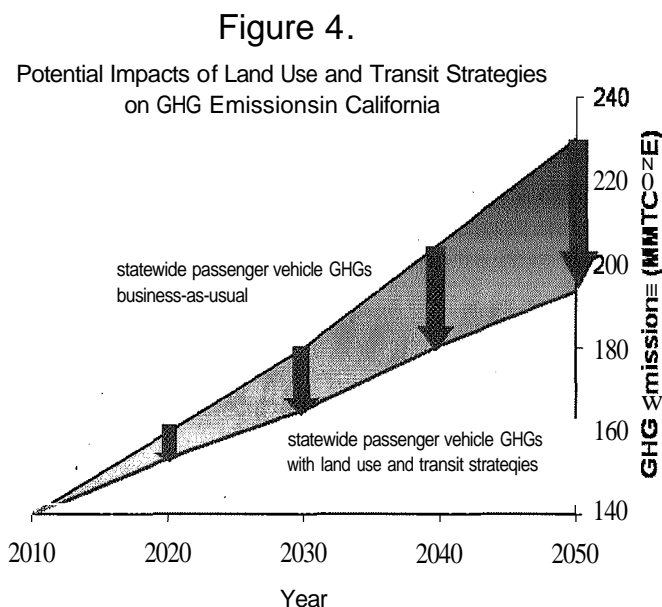
Estimating the Benefits of Regional Targets

The ARB estimate of the statewide benefit of regional transportation-related greenhouse gas emissions reduction targets is based on analysis of research results quantifying the effects of land use and transportation strategies. The emissions reduction number in Table 11 is not the statewide metric for regional targets that must be developed as SB 375 is implemented. The emissions target will ultimately be determined during the SB 375 process.

The possible impacts of land use and transportation policies have been well documented. Most recently, a 2008 D.C. Berkeley study³⁷ reviewed over 20 modeling studies from California (including the State's four largest MPOs), other states and Europe. The study found a range of 0.4 to 7.7 percent reduction in vehicle miles traveled (VMT) resulting from a combination of land use and enhanced transit policies compared to a business-as-usual case over a 10-year horizon, with benefits doubling by 2030, as shown in Figure 4. With the inclusion of additional measures

³⁷Rodier, Caroline. U.C. Berkeley, Transportation Sustainability Research Center, "A Review of the International Modeling Literature: Transit, Land Use, and Auto Pricing Strategies to Reduce Vehicle Miles Traveled and Greenhouse Gas Emissions," August 2008. http://www.arb.ca.gov/planning/tsaq/docs/rodier_8-1-08_trb_paper.pdf (accessed October 12, 2008)

such as pricing policies, the reduction of greenhouse gas emissions can be greater. These strategies will be considered during the target-setting process. Sophisticated land use and transportation models can best assess these effects. As part of the development of regional targets, technical tools will need to be refined to ensure sound quantification techniques are available.



The potential benefits of this measure that can be realized by 2020 (as shown in Table 11) were estimated after first accounting for the benefits of the vehicle technology and efficiency measures in the plan. It was calculated based on the D.C. Berkeley study's median value of 4 percent per capita VMT reduction over a 10-year time horizon. This value should not be interpreted as the final estimate of the benefits of this measure. The current academic literature supports this realistic statewide estimate of potential benefits, but the ultimate benefit will be determined as an outcome of SB 375 implementation on a regional level. The incentives for sustainable planning in SB 375 can set California on a new path. ARB's establishment of regional targets in 2010, combined with the Regional Targets Advisory Committee process, required by the legislation, provides a clear mechanism for maximizing the benefits of this measure.

Additional Benefits of Regional Targets and Land Use Strategies

Land use and transportation measures that help reduce vehicle travel will also provide multiple benefits beyond greenhouse gas reductions. Quality of life will be improved by increasing access to a variety of mobility options such as transit, biking, and walking, and will provide a diversity of housing options focused on proximity to jobs, recreation, and services. Other important state and community goals that could be met through better integrated land use and transportation planning include

agricultural, open space and habitat preservation, improved water quality, positive health effects, and the reduction of smog forming pollutants.

Growing more sustainably has the potential to provide additional greenhouse gas and energy savings by encouraging more compact, mixed-use developments resulting in reduced demand for electricity and heating and cooling energy. These land use-related energy savings will contribute toward the Plan's energy efficiency measures to achieve the goal of reducing electricity and natural gas usage. ARB is continuing to evaluate the greenhouse gas emissions reductions that may be additional to the proposed measures in this plan.

Table 11: Regional Transportation-Related Greenhouse Gas Targets Recommendation (MMTC02E in 2020)

Measure No.	Measure Description	Reductions
T-3	Regional Transportation-Related Greenhouse Gas Targets ³⁸	5
	Total	5

7. Vehicle Efficiency Measures

Implement light-duty vehicle efficiency measures.

Several additional measures could reduce light-duty vehicle greenhouse gas emissions. The California Integrated Waste Management Board (CIWMB) with various partners continues to conduct a public awareness campaign to promote sustainable tire practices. ARB is pursuing a regulation to ensure that tires are properly inflated when vehicles are serviced. In addition, CEC in consultation with CIWMB is developing an efficient tire program focusing first on data gathering and outreach, then on potential adoption of minimum fuel-efficient tire standards, and lastly on the development of consumer information requirements for replacing tires. ARB is also pursuing ways to reduce engine load via lower friction oil and reducing the need for air conditioner use. ARB is actively engaged in the regulatory development process for the tire inflation component of this measure. Current information indicates the reduction of greenhouse gas emissions is likely to be less than estimated in the Draft Scoping Plan. ARB has adjusted the estimated reductions shown in Table 12 to reflect this.

³⁸ This number represents an estimate of what may be achieved from local land use changes. It is not the SB 375 regional target. ARB will establish regional targets for each MPO region following the input of the Regional Targets Advisory Committee and a public consultation process with MPOs and other stakeholders per SB 375.

**Table 12: Vehicle Efficiency Recommendation
(MMTC02E in 2020)**

Measure No.	Measure Description	Reductions
T-4	Vehicle Efficiency Measures	4.5
Total		4.5

8. Goods Movement

Implement adopted regulations for the use of shore power for ships at berth. Improve efficiency in goods movement activities.

A significant portion of greenhouse gas emissions from transportation activities comes from the movement of freight or goods throughout the state. Activity at California ports is forecast to increase by 250 percent between now and 2020. Both the Goods Movement Emission Reduction Plan (GMERP) and the 2007 State Implementation Plan (SIP) contain numerous measures designed to reduce the public health impact of goods movement activities in California. ARB has already adopted a regulation to require ship electrification at ports. Proposition IB funds, as well as clean air plans being implemented by California's ports, will also help reduce greenhouse gas emissions while cutting criteria pollutant and toxic diesel emissions. ARB is proposing to develop and implement additional measures to reduce greenhouse gas emissions due to goods movement from trucks, ports and other related facilities. The anticipated reductions would be above and beyond what is already expected in the GMERP and the SIP. This effort should provide accompanying reductions in air toxics and smog forming emissions. The estimated reduction of greenhouse gas emissions is shown in Table 13.

After further evaluation, ARB incorporated the Draft Scoping Plan's Heavy-Duty Vehicle-Efficiency measure into the Goods Movement measure. A Heavy-Duty Engine Efficiency-measure could reduce emissions associated with goods movement through improvements which could involve advanced combustion strategies, friction reduction, waste heat recovery, and electrification of accessories. ARB will consider setting requirements and standards for heavy-duty engine efficiency in the future if higher levels of efficiency are not being produced either in response to market forces (fuel costs) or federal standards.

**Table 13: Goods Movement Recommendation
(MMTC02E in 2020)**

Measure No.	Measure Description	Reductions
T-5	Ship Electrification at Ports (Discrete Early Action)	0.2
T-6	Goods Movement Efficiency Measures <ul style="list-style-type: none"> • System-Wide Efficiency Improvements 	3.5
Total		3.7

9. Million Solar Roofs Program

Install 3,000 MW of solar-electric capacity under California's existing solar programs.

As part of Governor Schwarzenegger's Million Solar Roofs Program, California has set a goal to install 3,000 megawatts (MW) of new solar capacity by 2017 - moving the state toward a cleaner energy future and helping lower the cost of solar systems for consumers. The Million Solar Roofs Initiative is a ratepayer-financed incentive program aimed at transforming the market for rooftop solar systems by driving down costs over time. Created under Senate Bill 1 (Murray, Chapter 132, Statutes of 2006), the Million Solar Roofs Program includes CPUC's California Solar Initiative and CEC's New Solar Homes Partnership, and requires publicly-owned utilities (POUs) to adopt, implement and finance a solar incentive program. This measure would offset electricity from the grid, thereby reducing greenhouse gas emissions. The estimated emissions reductions are shown in Table 14.

Obtaining the incentives requires the building owners or developers to meet certain efficiency requirements: specifically, that new construction projects meet energy efficiency levels that exceed the State's Title 24 Building Energy Efficiency Standards, and that existing commercial buildings undergo an energy audit. Thus, the program is also a mechanism for achieving the efficiency targets for the Energy sector. By requiring greater energy efficiency for projects that seek solar incentives, the State would be able to reduce both electricity and natural gas needs and their associated greenhouse gas emissions.

Table 14: Million Solar Roofs Recommendation (MMTC02E in 2020)

Measure No.	Measure Description	Reductions
E-4	Million Solar Roofs (including California Solar Initiative, New Solar Homes Partnership and solar programs of publicly owned utilities)	2.1
	• Target of 3000 MW Total Installation by 2020	
	Total	2.1

10. Medium/Heavy-Duty Vehicles

Adopt medium and heavy-duty vehicle efficiency measures.

Medium- and heavy-duty vehicles account for approximately 20 percent of the transportation greenhouse gas inventory. Requiring retrofits to improve the fuel efficiency of heavy-duty trucks could include a requirement for devices that reduce aerodynamic drag and rolling resistance. In addition, hybridization of medium- and heavy-duty vehicles would also reduce greenhouse gas emissions through increased fuel efficiency. Hybrid trucks would likely achieve the greatest benefits in urban, stop-and-go applications, such as parcel delivery, utility services, transit, and other

vocational work trucks. The recommendation for this sector is summarized in Table 15.

Table 15: Medium/Heavy-Duty Vehicle Recommendation (MMTC02E in 2020)

Measure No.	Measure Description	Reductions
T-7	Heavy-Duty Vehicle Greenhouse Gas Emissions Reduction Measure - Aerodynamic Efficiency (Discrete Early Action)	0.9
T-8	Medium/Heavy-Duty Vehicle Hybridization	0.5
	Total	1.4

11. Industrial Emissions

Require assessment of large industrial sources to determine whether individual sources within a facility can cost-effectively reduce greenhouse gas emissions and provide other pollution reduction co-benefits. Reduce greenhouse gas emissions from fugitive emissions from oil and gas extraction and gas transmission. Adopt and implement regulations to control fugitive methane emissions and reduce flaring at refineries.

Energy Efficiency and Co-Benefits Audits for Large Industrial Sources

This measure would apply to the direct greenhouse gas emissions at major industrial facilities emitting more than 0.5 MMTCO₂E per year. In general, these facilities also have significant emissions of criteria air pollutants, toxic air pollutants, or both. Major industrial facilities include power plants, refineries, cement plants, and miscellaneous other sources. ARB would implement this measure through a regulation, requiring each facility to conduct an energy efficiency audit of individual combustion and other direct sources of greenhouse gases within the facility to determine the potential reduction opportunities, including criteria air pollutants and toxic air contaminants. The audit would include an assessment of the impacts of replacing or upgrading older, less efficient units such as boilers and heaters, or replacing the units with combined heat and power (CHP) units. The measure is summarized in Table 16.

The audit would help ARB to identify potential reductions of greenhouse gas emissions reductions, the associated costs and cost-effectiveness, their technical feasibility, and the potential to reduce air pollution impacts at the local or regional level. ARB will use the results to determine if certain emissions sources within a facility can make cost-effective reductions of greenhouse gas emissions that also provide reductions in other criteria or toxic pollutants. Where this is the case, rule provisions or permit conditions would be considered to ensure the best combination of pollution reductions. Nothing in this measure would delay known cost-effective strategies that otherwise would be required.

The California Long Term Energy Efficiency Strategic Plan (CPUC) discusses a number of strategies associated with improving industrial sector efficiency and greenhouse gas emissions reductions, including the development of certification protocols for industrial efficiency improvements to develop market recognition for efficiency gains.

Oil and Gas Recovery Operations and Transmission/Refineries

California is a major oil and gas producer. Crude oil, both from in-state and imported sources, is processed at 21 oil refineries in the state. In addition to conforming to the requirements of the cap-and-trade program and the audit measure, ARB has identified four specific measures for development and implementation, two for oil and gas recovery operations and gas transmission, and two for refineries. Other industrial measures that were under consideration affect greenhouse gas emissions sources that are fully regulated under cap and trade, which ARB concluded would provide cost-effective reductions of greenhouse gas emissions. All measures would be designed to secure a combination of cost-effective reductions in greenhouse gas emissions, criteria air pollutants and air toxics. Two measures would be developed to reduce methane emissions in the oil and gas production and gas transmission processes from leaks and incomplete combustion of methane (used as fuel). These measures would include improved leak detection, process modifications, equipment retrofits, installation of new equipment, and best management practices. The first measure would affect oil and gas producers. The second would impact operators of natural gas pipeline systems. These fugitive emissions are not proposed to be covered by a cap and trade program, although combustion-related emissions from these operations are proposed to be covered. The WCI partner jurisdictions are currently evaluating the inclusion of fugitive methane emissions to the extent that adequate quantification methods exist. During implementation of this measure, ARB will determine whether these emissions will also be covered in California's cap-and-trade program. If the emissions are covered under the cap, ARB will evaluate the need for the measures described here.

Two measures would be developed for oil refineries. The first would limit the greenhouse gas emissions from refinery flares while preserving flaring as needed for safety reasons. The second would remove the current fugitive methane exemption in most refinery Volatile Organic Compounds (VOC) regulations. This exemption was established because methane does not appreciably contribute to urban smog, but is inappropriate given the role that methane plays in global warming. ARB believes these measures would provide cost-effective greenhouse gas, criteria pollutants and air toxics emissions reductions. Most combustion and other process emissions at refineries would be governed by the cap-and-trade program. As with the oil and gas production measures above, the need for these measures would be evaluated if fugitive methane is included in the WCI cap-and-trade program.

**Table 16: Industrial Emissions Recommendation
(MMTC02E in 2020)**

Measure No.	Measure Description	Reductions
1-1	Energy Efficiency and Co-Benefits Audits for Large Industrial Sources	TBD
1-2	Oil and Gas Extraction GHG Emissions Reduction	0.2
1-3	GHG Leak Reduction from Oil and Gas Transmission	0.9
1-4	Refinery Flare Recovery Process Improvements	0.33
1-5	Removal of Methane Exemption from Existing Refinery Regulations	0.01
	Total	1.4

12. High Speed Rail

Support implementation of a high speed rail system.

A high speed rail (HSR) system is part of the statewide strategy to provide more mobility choice and reduce greenhouse gas emissions. This measure supports implementation of plans to construct and operate a HSR system between northern and southern California. As planned, the HSR is a 700-mile-long rail system capable of speeds in excess of 200 miles per hour on dedicated, fully-grade separated tracks with state-of-the-art safety, signaling and automated rail control systems. The system would serve the major metropolitan centers of California in 2030 and is projected to displace between 86 and 117 million riders from other travel modes in 2030.

For Phase 1 of the HSR, between San Francisco and Anaheim, 2020 is projected to be the first year of service, with 26 percent of the projected 2030 full system ridership levels. The anticipated reduction of greenhouse gas emissions are shown in Table 17. HSR system ridership and the benefits associated with it are anticipated to increase over time as additional portions of the planned system are completed. Over the long term, the system also has the potential to support the reduction of greenhouse gas emissions in the transportation sector from land use strategies, by providing opportunities for and encouraging low-impact transit-oriented development.

HSR implementation is dependent on voter approval, and the "Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century" will appear on the November 2008 ballot as Proposition 1A. If Proposition 1A is approved, construction of HSR is anticipated to begin in 2010, with full implementation anticipated in 2030.

**Table 17: High Speed Rail Recommendation
(MMTC02E in 2020)**

Measure No.	Measure Description	Reductions
T-9	High Speed Rail	1.0
	Total	1.0

13. Green Building Strategy

Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.

Collectively, energy use and related activities by buildings are the second largest contributor to California's greenhouse gas emissions. Almost one-quarter of California's greenhouse gas emissions can be attributed to buildings.³⁹ As the Governor recognized in his Green Building Initiative (Executive Order S-20-04), significant reductions in greenhouse gas emissions can be achieved through the design and construction of new green buildings as well as the sustainable operation, retrofitting, and renovation of existing buildings.

A Green Building strategy offers a comprehensive approach to reducing direct and upstream greenhouse gas emissions that cross-cuts multiple sectors including Electricity, Natural Gas, Water, Recycling, Waste, and Transportation. Green buildings are designed, constructed, renovated, operated, and maintained using an integrated approach that reduces greenhouse gas emissions by maximizing energy and resource efficiency. Employing a whole-building design approach can create tremendous synergies that result in multiple benefits at little or no net cost, allowing for efficiencies that would never be possible on an incremental basis.

A Green Building strategy will produce greenhouse gas saving through buildings that exceed minimum energy efficiency standards, decrease consumption of potable water, reduce solid waste during construction and operation, and incorporate sustainable materials. Combined these measures can also contribute to healthy indoor air quality, protect human health and minimize impacts to the environment. A Green Building strategy also includes siting considerations. Buildings that are sited close to public transportation or near mixed-use areas can work in tandem with transportation-related strategies to decrease greenhouse gas emissions that result from that sector.

In July 2008, the California Building Standards Commission (CBSC) adopted the Green Building Standards Code (GBSC) for all new construction in the state. While the current version of the commercial green building code is voluntary, CBSC anticipates adopting a mandatory code in 2011 which will institute minimum environmental performance standards for all occupancies. The Green Building Strategy includes Zero Net Energy (ZNE) goals for new and existing homes and commercial buildings consistent with the recently-adopted California Long Term Energy Efficiency Strategic Plan. ARB encourages local governments to raise the bar by adopting "beyond-code" green building requirements. To assist this effort, State government would develop and regularly tighten voluntary standards, written in GBSC language for easy adoption by local jurisdictions.

³⁹ Greenhouse gas emission estimates from electricity, natural gas, and water use in homes and commercial buildings.

As we approach the 2020 and 2030 targets for zero energy buildings, these "percent above code" targets must shift to "percent of ZNE" targets. Zero energy new and existing buildings can be an overarching and unifying concept for energy efficiency in buildings, as discussed above (building energy efficiency measures E-1 and CR-1). In order to achieve statewide GHG emission reductions, these targets should be expanded to address other aspects of environmental performance. For example, these targets could be re-framed as a carbon footprint reduction goal for a 35 percent reduction in both energy and water consumption. For commercial buildings, a 2011 target should be established such that a quarter of all new buildings reduce energy and water consumption by at least 25 percent beyond code.

Furthermore, retrofitting existing residential and commercial buildings would achieve substantial greenhouse gas emissions reduction benefits. This Proposed Scoping Plan recommends the establishment of an environmental performance rating system for homes and commercial buildings and further recommends that California adopt mechanisms to encourage and require retrofits for buildings that do not meet minimum standards of performance.

An effective green building framework can operate to deliver reductions of greenhouse gas emissions in multiple sectors. The green building strategies provide a vehicle to achieve the statewide electricity and natural gas efficiency targets and lower greenhouse gas emissions from the waste and water transport sectors. Achieving these green building emissions reductions will require coordinated efforts from a broad range of stakeholders, and new financing mechanisms to motivate investment in green building strategies.

Achieving significant greenhouse gas emissions reductions from new and existing buildings will require a combination of green building measures for new construction and retrofits to existing buildings. The State of California will set an example by requiring all new State buildings to exceed existing Green Building Initiative energy goals and achieve nationally-recognized building sustainability standards such as Leadership in Energy and Environmental Design - New Construction (LEED-NC) "Gold" certification. Existing State buildings would also be retrofitted to achieve higher standards equivalent to LEED-EB for existing buildings (EB) "Silver." All new schools should be required to meet the Collaborative for High Performance Schools (CHPS) 2009 criteria. Existing schools applying for modernization funds should also be required to meet CHPS 2009 criteria.

ARB estimates that the greenhouse gas savings from green building measures as approximately 26 MMTCO₂E, as shown in Table 18 below. Most of these reductions are accounted for in the Electricity, Waste, Water, and Transportation sectors. Because of this, ARB has assigned all emissions reductions that occur as a result of green building strategies to other sectors for purposes of meeting AB 32 requirements, but will continue to evaluate and refine the emissions from this sector. As such, this strategy will require implementation from various entities within

California, including CEC, PUC, State Architect, and others, each taking the lead in their area of authority and expertise.

**Table 18: Green Buildings Recommendation
(MMTC02E in 2020)**

Measure No.	Measure Description	Reductions
GB-1	Green Buildings ⁴⁰	26
Total		26

14. High Global Warming Potential Gases

Adopt measures to reduce high global warming potential gases.

High global warming potential (GWP) gases pose a unique challenge. Just a few pounds of high GWP materials can have the equivalent effect on global warming as several *tons* of carbon dioxide. For example, the average refrigerator has about a half-pound of refrigerant and about one pound of "blowing agents" used to make the insulating foam. If these gases were released into the atmosphere, they would have a global warming impact equivalent to five metric tons of CO₂.

High GWP chemicals are very common and are used in many different applications such as refrigeration, air conditioning systems, fire suppression systems, and the production of insulating foam. Because these gases have been in use for years, old refrigerators, air conditioners and foam insulation represent a significant "bank" of these materials yet to be released. High GWP gases are released primarily in two ways. The first is through leaking systems, and the second is during the disposal process. Once high GWP materials are released, they persist in the atmosphere for tens or even hundreds of years. Recommended measures to address this growing problem take the form of direct regulations and use of mitigation fees.

ARB identified four Discrete Early Action measures to reduce greenhouse gas emissions from the refrigerants used in car air conditioners, semiconductor manufacturing, air quality tracer studies, and consumer products. ARB has identified additional potential reduction opportunities based on specifications for future commercial and industrial refrigeration, changing the refrigerants used in auto air conditioning systems, and ensuring that existing car air conditioning systems as well as stationary refrigeration equipment do not leak. Recovery and destruction of high GWP materials in the banks described above could also provide significant reductions.

⁴⁰ Although some of these emissions reductions may be additional, most of them are accounted for in the Energy, Waste, Water, and Transportation sectors. In addition, some of these reductions may occur out of state, making quantification more difficult. Because of this, these emissions reductions are not currently counted toward the AB 32 2020 goal.

ARB is also proposing to establish an upstream mitigation fee on the use of high GWP gases. Even with the reductions from the specific high GWP measures described above, this sector's emissions are still projected to more than double from current levels by 2020. This is because of the high growth in the sector due, in part, to the replacement of ozone-depleting substances being phased out of production. These emissions would be difficult to address via traditional approaches since the gases are used in small quantities in very diverse applications. Additionally, there are no proven substitutes or alternatives for some uses, and the relative low price of most high GWP compounds provides little incentive to develop alternatives, reduce leakage, or recover the gases at end-of-life.

An upstream fee would ensure that the climate impact of these substances is reflected in the total cost of the product, encouraging reduced use and end-of-life losses, as well as the development of alternatives. The fee would be variable and associated with the impact the product makes on public health and the environment. This could encourage product innovation because fees would correspondingly decrease as the manufacturer or producer redesigned their product or found lower-cost alternatives. This mitigation fee would complement many of the downstream high GWP regulations currently being developed.⁴¹ Fees on high GWP gases would be set to be consistent with the cost of reducing greenhouse gas emissions and could be set to reduce multiple environmental impacts. Revenues could be used to mitigate greenhouse gas emissions either from other high GWP compounds or other greenhouse gases.

Table 19 summarizes the recommendations for measures in the High GWP sector. These measures address both high GWP gases identified in AB 32 and also other high GWP gases, such as ozone-depleting substances that are only partially covered by the Montreal Protocol. The emissions reductions shown are only for the six greenhouse gases explicitly identified in AB 32.

⁴¹ Industrial process emissions of high GWP gases are also expected to be part of the cap-and-trade program. As ARB moves through the rulemaking for both the high GWP fee and the cap-and-trade program, staff will evaluate whether these are complementary approaches or if one or the other needs to be adjusted to prevent duplicative regulation of the industrial process emissions of these gases.

**Table 19: High GWP Gases Sector Recommendation
(MMTC02E in 2020)**

Measure No.	Measure Description	Reductions
H-1	Motor Vehicle Air Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Servicing (Discrete Early Action)	0.26
H-2	SF ₆ Limits in Non-Utility and Non-Semiconductor Applications (Discrete Early Action)	0.3
H-3	Reduction of Perfluorocarbons in Semiconductor Manufacturing (Discrete Early Action)	0.15
H-4	Limit High GWP Use in Consumer Products (Discrete Early Action) (Adopted June 2008)	0.25
	High GWP Reductions from Mobile Sources	
	<ul style="list-style-type: none"> • Low GWP Refrigerants for New Motor Vehicle Air Conditioning Systems • Air Conditioner Refrigerant Leak Test During Vehicle Smog Check 	
H-5	<ul style="list-style-type: none"> • Refrigerant Recovery from Decommissioned Refrigerated Shipping Containers • Enforcement of Federal Ban on Refrigerant Release during Servicing or Dismantling of Motor Vehicle Air Conditioning Systems 	3.3
	High GWP Reductions from Stationary Sources	
	<ul style="list-style-type: none"> • High GWP Stationary Equipment Refrigerant Management Program: <ul style="list-style-type: none"> o Refrigerant Tracking/Reporting/Repair Deposit Program o Specifications for Commercial and Industrial Refrigeration Systems 	
H-6	<ul style="list-style-type: none"> • Foam Recovery and Destruction Program • SF₆ Leak Reduction and Recycling in Electrical Applications • Alternative Suppressants in Fire Protection Systems • Residential Refrigeration Early Retirement Program 	10.9
H-7	Mitigation Fee on High GWP Gases ⁴²	5
	Total	20.2

⁴² The 5 MMTC0₂E reduction is an estimate of what **might** occur with a fee in place. Additional emissions reductions from a fee would be expected as resulting revenues are used in mitigation programs. Using the funds to mitigate greenhouse gas emissions could substantially increase the emissions reductions from this measure.

15. Recycling and Waste

Reduce methane emissions at landfills. Increase waste diversion, composting, and commercial recycling. Move toward zero-waste.

California has a long track record of reducing greenhouse gas emissions by turning waste into resources, exemplified by the waste diversion rate from landfills of 54 percent (which exceeds the current 50 percent mandate) resulting from recovery of recyclable materials. Re-introducing recyclables with intrinsic energy value back into the manufacturing process reduces greenhouse gas emissions from multiple phases of product production including extraction of raw materials, preprocessing and manufacturing. Additionally, by recovering organic materials from the waste stream, and having a vibrant compost industry, there is an opportunity to further reduce greenhouse gas emissions through the indirect benefits associated with the reduced need for water and fertilizer for California's Agricultural sector. Incentives may also be an effective way to secure greenhouse gas emissions reductions in this sector. Table 20 summarizes the emissions reductions from Recycling and Waste sector.

Reduction in landfill Methane

Methane emissions from landfills, generated when wastes decompose, account for one percent of California's greenhouse gas emissions. Greenhouse gas emissions can be substantially reduced by properly managing all materials to minimize the generation of waste, maximize the diversion from landfills, and manage them to their highest and best use. Capturing landfill methane results in greenhouse gas benefits, as well as reductions in other air pollutants such as volatile organic compounds. ARB is working closely with the California Integrated Waste Management Board (CIWMB) to develop a Discrete Early Action measure for landfill methane control that will be presented to ARB in January.

CIWMB is also pursuing efforts to reduce methane emissions by diverting organics from landfills, and to promote best management practices at smaller uncontrolled landfills. Landfill gas may also provide a viable source of liquefied natural gas (LNG) vehicle fuel. Reductions from these types of projects would be accounted for in the Transportation sector.

High Recycling/ Zero Waste

This measure reduces greenhouse gas emissions primarily by reducing the substantial energy use associated with the acquisition of raw materials in the manufacturing stage of a product's life-cycle. As virgin raw materials are replaced with recyclables, a large reduction in energy consumption should be realized. Implementing programs with a systems approach that focus on consumer demand, manufacturing, and movement of products will result in the reduction of greenhouse gas emissions and other co-benefits. Reducing waste and materials at the source of generation, increased use of compost to benefit soils, coupled with increased recycling - especially in the commercial sector - and Extended Producer Responsibility (EPR)

plus Environmentally Preferable Purchasing (EPP) also have the potential to reduce emissions, both in-state and within the connected global economy. This measure could also assist in meeting the 33 percent renewables energy goal through deployment of anaerobic digestion for production of fuels/energy.

As noted by ETAAC, recycling in the commercial sector could be substantially increased. This could be implemented, for example, through voluntary or mandatory programs, including protocols, enhanced partnerships with local governments, and provision of appropriate financial incentives. ARB will work with CIWMB to develop and implement these types of programs. ARB will also work with CIWMB, the California Department of Food and Agriculture, the Department of Transportation, and others to provide direct incentives for the use of compost in agriculture and landscaping. Further, CIWMB will explore the use of incentives for all Recycling and Waste Management measures, including for commercial recycling and for local jurisdictions to encourage the collection of residentially and commercially-generated food scraps for composting and in-vessel anaerobic digestion.

Table 20: Recycling and Waste Sector Recommendation - Landfill Methane Capture and High Recycling/Zero Waste (MMTC02E in 2020)

Measure No.	Measure Description	Reductions
RW-1	Landfill Methane Control (Discrete Early Action)	1
RW-2	Additional Reductions in Landfill Methane <ul style="list-style-type: none"> • Increase the Efficiency of Landfill Methane Capture 	TBD
RW-3	High Recycling/Zero Waste <ul style="list-style-type: none"> • Commercial Recycling • Increase Production and Markets for Compost • Anaerobic Digestion • Extended Producer Responsibility • Environmentally Preferable Purchasing 	9
Total		10(43)

16. Sustainable Forests

Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation.

The 2020 Proposed Scoping Plan target for California's forest sector is to maintain the current 5 MMTC02E of sequestration through sustainable management practices, including reducing the risk of catastrophic wildfire, and the avoidance or mitigation of land-use changes that reduce carbon storage. California's Board of Forestry and

43 Reductions from RW-2 and RW-3 are not counted toward the AB 32 goal. ARB is continuing to work with CIWMB to quantify these emissions and determine what portion of the reductions can be credited to meeting the AB 32 2020 goal. These measures may provide greater emissions reductions than estimated.

Fire Protection has the existing authority to provide for sustainable management practices, and will, at a minimum, work to maintain current carbon sequestration levels. The Resources Agency and its departments will also have an important role to play in implementing this measure.

In addition, the Resources Agency is supporting voluntary actions, including expenditure of public funds for projects focused largely on conserving biodiversity, providing recreation, promoting sustainable forest management and other projects that also provide carbon sequestration benefits. The federal government must also use its regulatory authority to, at a minimum, maintain current carbon sequestration levels for land under its jurisdiction in California.

Forests in California are now a carbon sink. This means that atmospheric removal of carbon through sequestration is greater than atmospheric emissions from processes like fire and decomposition of wood. However, several factors, such as wildfires and forest land conversion, may cause a decline in the carbon sink. The 2020 target would provide a mechanism to help ensure that current carbon stocks are, at a minimum, maintained and do not diminish over time. The 5 MMTCO₂E emission reduction target is set equal to the magnitude of the current estimate of net emissions from California's forest sector. As technical data improve, the target can be recalibrated to reflect new information.

California's forests will play an even greater role in reducing carbon emissions for the 2050 greenhouse gas emissions reduction goals. Forests are unique in that planting trees today will maximize their sequestration capacity in 20 to 50 years. As a result, near-term investments in activities such as planting trees will help us reach our 2020 target, but will also play a greater role in reaching our 2050 goals.

Monitoring carbon sequestered on forest lands will be necessary to implement the target. The Board of Forestry and Fire Protection, working with the Resources Agency, the Department of Forestry and Fire Protection and ARB would be tasked with developing a monitoring program, improving greenhouse gas inventories, and determining what actions are needed to meet the 2020 target for the Forest sector. Future climate impacts will exacerbate existing wildfire and insect disturbances in the Forest sector. These disturbances will create new uncertainties in reducing emissions and maintaining sequestration levels over the long-term, requiring more creative strategies for adapting to these changes. In the short term, focusing on sustainable management practices and land-use issues is a practical approach for moving forward.

Future land use decisions will play a role in reaching our greenhouse gas emissions reduction goals for all sectors. Loss of forest land to development increases greenhouse gas emissions levels because less carbon is sequestered. Avoiding or mitigating such conversions will support efforts to meet the 2020 goal. When significant changes occur, the California Environmental Quality Act is a mechanism providing for assessment and mitigation of greenhouse gas emissions.

Going forward there are a number of forestry-related strategies that can play an important role in California's greenhouse gas emissions reduction efforts. Biomass resources from forest residue will factor into the expansion of renewable energy sources (this is currently accounted for in the Energy sector). Similarly, no reductions are yet attributed to future actions to reduce wildfire risk, but that accounting will be done following implementation. Additionally, public investments to purchase and preserve forests and woodlands would also provide greenhouse gas emission reductions that will be accounted for as projects are funded and urban forest projects can also provide the dual benefit of carbon sequestration and shading to reduce air conditioning load.

Furthermore, the Forest sector currently functions as a source of voluntary reductions that would not otherwise occur and this role could expand even further in the future. ARB has already adopted a methodology to quantify reductions from forest projects, and recently adopted additional quantification methodologies. Table 21 summarizes the emission reductions from the forest measure.

**Table 21: Sustainable Forests Recommendation
(MMTC02E in 2020)**

Measure No.	Measure Description	Reductions
F-1	Sustainable Forest Target	5
Total		5

17. Water

Continue efficiency programs and use cleaner energy sources to move and treat water.

Water use requires significant amounts of energy. Approximately one-fifth of the electricity and one-third of the non-power plant natural gas consumed in the state are associated with water delivery, treatment and use. Although State, federal, and local water projects have allowed the state to grow and meet its water demands, greenhouse gas emissions can be reduced if we can move, treat, and use water more efficiently. As is the case with energy efficiency, California has a long history of advancing water efficiency and conservation programs. Without this ongoing, critical work, baseline or business-as-usual greenhouse gas emissions associated with water use would be much higher than is currently the case.

Six greenhouse gas emission reduction measures are proposed for the Water sector, and are shown in Table 21. Three of the measures target reducing energy requirements associated with providing reliable water supplies and two measures are aimed at reducing the amount of non-renewable electricity associated with conveying and treating water. The final measure focuses on providing sustainable funding for

implementing these actions. The greerihouse gas emission reductions from these measures are indirectly realized through reduced energy requirements and are accounted for in the Electricity and Natural Gas sector.

In addition, a mechanism to make allowances available in a cap-and-trade program could be used to provide additional incentives for local governments, water suppliers, and third party providers to bundle water and energy efficiency improvements. This type of allowance set-aside will be evaluated during the rulemaking for the cap-and-trade program.

ARB recommends a public goods charge for funding investments in water . management actions that improve water and energy efficiency and reduce GHG emissions. As noted by the Economic and Technology Advancements Advisory Committee, a public goods charge on water can be collected on water bills and then used to fund end-use water efficiency improvements, system-wide efficiency projects, water recycling, and other actions that improve water and energy efficiency and reduce GHG emissions. Depending on how the fee schedule is developed in a subsequent rulemaking process, a public goods charge could generate \$100 million to \$500 million annually. These actions would also have the co-benefit of improving water quality and water supply reliability for customers.

**Table 22: Water Recommendation
(MMTC02E in 2020)**

Measure No.	Measure Description	Reductions
W-1	Water Use Efficiency	1.4
W-2	Water Recycling	0.3
W-3	Water System Energy Efficiency	2.0
W-4	Reuse Urban Runoff	0.2
W-5	Increase Renewable Energy Production	0.9
W-6	Public Goods Charge	TBD
	Total	4.8(44)

18. Agriculture

In the near-term, encourage investment in manure digesters and at the five-year Scoping Plan update determine if the program should be made mandatory by 2020.

Encouraging the capture of methane through use of manure digester systems at dairies can provide emission reductions on a voluntary basis. This measure is also a

⁴⁴ Greenhouse gas emission reductions from the water sector are not currently counted toward the 2020 goal. ARB anticipates that a portion of these reductions will be additional to identified reductions in the Electricity sector and is working with the appropriate agencies to refine the electricity/water emissions inventory.

renewable energy strategy to promote the use of captured gas for fuels or power production. Initially, economic incentives such as marketable emission reduction credits, favorable utility contracts, or renewable energy incentives will be needed. Quantified reductions for this measure (shown in Table 23) are not included in the sum of statewide reductions shown in Table 2 since the initial approach is voluntary. ARB and the California Climate Action Registry worked together on a manure digester protocol to establish methods for quantifying greenhouse gas emissions reductions from individual projects; the Board adopted this protocol in September 2008. The voluntary approach will be re-assessed at the five-year update of the Scoping Plan to determine if the program should become mandatory for large dairies by 2020.

Nitrogen fertilizer, which produces *N₂O* emissions, is the other significant source of greenhouse gases in the Agricultural sector. ARB has begun a research program to better understand the variables affecting fertilizer *N₂O* emissions (Phase 1), and based on the findings, will explore opportunities for emission reductions (Phase 2).

There may be significant potential for additional voluntary reductions in the agricultural sector through strategies, such as those recommended by ETAAC. These opportunities include increases in fuel efficiency of on-farm equipment, water use efficiency, and biomass utilization for fuels and power production.

Increasing carbon sequestration, including on working rangelands, hardwood and riparian woodland reforestation, also hold potential as a greenhouse gas strategies. As we evaluate the role that this sector can play in California’s emissions reduction efforts, we will explore the feasibility of developing sound quantification protocols so that these and other related strategies may be employed in the future.

**Table 23: Agriculture Recommendation
(MMTC02E in 2020)**

Measure No.	Measure Description	Reductions
A-1	Methane Capture at Large Dairies ⁴⁵	1.0
Total		1.0

D. Voluntary Early Actions and Reductions

Many individual activities that are not currently addressed under regulatory approaches can nevertheless result in cost-effective, real, additional, and verifiable greenhouse gas emissions reductions that will help California meet its 2020 target. Ensuring that appropriate credit is available to these types of emissions reduction projects will also help jump-start a new wave of technologies that will feature prominently in California and the world’s long-term efforts

⁴⁵ Because the emission reductions from this measure are not required, they are not counted in the total.

to combat climate change. ARB will pursue several approaches that will recognize and reward these types of projects.

1. Voluntary Early Action

ARB is required to design regulations to encourage early action to reduce greenhouse gas emissions, and to provide appropriate recognition or credit for that action: (HSC §38562(b)(1) and (3)) Recognizing and rewarding greenhouse gas emissions reductions that occur prior to the full implementation of the AB 32 program can set the stage for innovation by incentivizing the development and employment of new clean technologies and by generating economic and environmental benefits for California.

In February 2008, ARB adopted a policy statement encouraging the early reductions of greenhouse gas emissions.⁴⁶ The policy statement describes a process for interested parties to submit proposed emission quantification methodologies for voluntary greenhouse gas emissions reductions to ARB for review. The intent is to provide a rapid assessment of methodologies for evaluating potential greenhouse gas emissions reduction projects to encourage early actions. Where appropriate, ARB will issue Executive Orders to confirm the technical soundness of the methodologies, and the methodology would be available for use by other parties to demonstrate the creation of voluntary early reductions. ARB is currently in the process of evaluating a number of submitted project methodologies.

ARB will provide appropriate credit for voluntary early reductions that can be adequately quantified and verified through three primary means. First, within the cap-and-trade program, ARB would set aside a certain number of allowances from the first compliance period to use to reward voluntary reductions that occur before 2012. In addition, ARB will assure that the allocation process in the first compliance period does not disadvantage facilities that have made reductions after AB 32 went into effect at the start of 2007 and before 2012.⁴⁷ The third approach will be to design other regulations, to the extent feasible, to recognize and reward early action.. These approaches are discussed in more detail in Appendix C.

2. Voluntary Reductions

Emissions reduction projects that are not otherwise regulated, covered under an emissions cap, or undertaken as a result of government incentive programs can generate "offsets." These are verifiable reductions whose ownership can be

⁴⁶Board Meeting Agenda. California Air Resources Board. February 28, 2008.
<http://www.arb.ca.gov/board/ma/2008/ma022808.htm> (accessed October 12,2008)

⁴⁷ ARB will evaluate whether some reductions that occurred prior to AB 32 going into effect on January 1, 2007, should also receive credit under these rules. For example, many facilities in California registered with the California Climate Action Registry after its creation in 2002 to document early actions to reduce emissions by having a record of entities profiles and baselines. ARB will evaluate what reductions made prior to 2007 should be eligible for credit from the allowance set-aside as part of the cap-and-trade program rulemaking.

transferred to others. Voluntary offset markets have recently flourished as a way for companies and individuals to offset their own emissions by purchasing reductions outside of their own operations. These sorts of voluntary efforts to reduce greenhouse gas emissions can play an important role in helping the State meet its overall greenhouse gas reduction goals.

ARB will adopt methodologies for quantifying voluntary reductions. (HSC §38571) The Board adopted a methodology for forest projects in October 2007, and for local government operations, urban forestry, and manure digesters in September 2008. The recognition of voluntary reduction or offset methodologies does not in any way guarantee that these offsets can be used for other compliance purposes. The Board would need to adopt regulations to verify and enforce reductions achieved under these or other approved methodologies before they could be used for compliance purposes. (HSC §38571)

Allowance set-asides, in addition to being used to potentially reward voluntary early actions by facilities that will be included in the cap-and-trade program, could also be used to reward voluntary early action at other facilities not covered by the cap. An early action allowance set-aside could be utilized both by entities that are covered by the cap, and by those who develop emissions reducing projects outside of the cap, or purchase the reductions associated with those projects, and have not sold or used them. Additional discussion of voluntary offsets is included in Appendix C.

E. Use of Allowances and Revenues

Revenues may be generated from the implementation of various proposed components of the Scoping Plan, including by the use of auctions within a cap-and-trade system or through the imposition of more targeted measures, such as a public goods charge on water. These revenues could be used to support AB 32 requirements for greenhouse gas emissions reductions and associated socio-economic considerations. This section summarizes some of the recommendations and ideas that ARB has received to date. As discussed in the description of the cap-and-trade measure above, ARB will seek input from a broad range of experts in an open public process regarding the options for allocation and revenue use under consideration.

The Economic and Technology Advancement Advisory Committee (ETAAC) recommended the creation of a California Carbon Trust as a possible mechanism for using revenues generated by the program, leveraged with private funds, to further the overall program goals. ETAAC's recommendation is roughly based on the United Kingdom Carbon Trust. The United Kingdom program was established with public funds, but now functions as a stand-alone corporation, providing management and consulting services to corporations and small and medium businesses on reducing greenhouse gas emissions. It also funds innovations in carbon reduction technologies. ETAAC recommended the creation of a similar organization that would use revenue from the sale of carbon allowances or from carbon fees to:

- Fund research, development and demonstration projects,
- Help bring promising and high potential technologies through the often challenging early stages of development and get them to market,
- Manage the early carbon market and mitigate price volatility, purchasing credits and selling them or retiring them as needed,
- Dedicate resources to fund projects to achieve AB 32 Environmental Justice goals, or
- Support a green technology workforce training program.

The most appropriate use for some of the allowances and revenue generated under AB 32 may be to retain it within or return it to the sector from which it was generated. For example, CEC and CPUC specifically recommended that significant portions of the revenue generated from the electricity sector under a cap-and-trade program be used for the benefit of that sector to support investments in renewable energy, efficiency, new energy technology, infrastructure, customer utility bill relief, and other similar programs. In the case of more targeted revenues from a public goods charge, the intent would be to use the funds for program purposes within the sector in which it was raised, for example in the water sector. ARB will seek input from a broad range of experts in an open public process, and will work with other agencies, the WCI partner jurisdictions, and stakeholders to consider the options for use of revenues from the AB 32 program.

Possible uses of allowances and of the revenue generated under the program include:

- Reducing costs of emissions reductions or achieving additional reductions - Funding energy efficiency and renewable resource development could lower overall costs to consumers and companies, and provide the opportunity to achieve greater emissions reductions than would otherwise be possible. Program revenues could be used to fund programs directly, or create financial incentives for others.
- Achieving environmental co-benefits - Criteria and toxic air pollutants create health risks, and some communities bear a disproportionate burden from air pollution. Revenues could be used to enhance greenhouse gas emission reductions that also provide reductions in air and other pollutants that affect public health.
- Incentives to local governments - Funding or other incentives to local governments for well-designed land-use planning and infrastructure projects could lead to shorter commutes and encourage walking, bicycling and the use of public transit. Funding of other incentives for local governments could also be used to increase recycling, composting, and to generating renewable energy from anaerobic digestion.
- Consumer rebates - Utilities and other businesses could use revenues to support and increase rebate programs to customers to offset some of the cost associated with increased investments in renewable resources and to encourage increased energy efficiency.

- **Direct refund to consumers** - Revenue from the program could be recycled directly back to consumers in a variety of forms including per capita dividends, earned income tax credits, or other mechanisms.
- **Climate change adaptation programs** - Climate change will impact natural and human environments. Program revenues could be used to help the state adapt to the effects of climate change which will be detailed in the State's Climate Adaptation Strategy being prepared by the Resources Agency to be completed in early 2009.
- **Subsidies** - Revenues could be used to reduce immediate cost impacts to covered industries required to make substantial upfront capital investments to reduce greenhouse gas emissions.
- **RD&D funding** - Revenues could be used to support research, development, and deployment of green technologies.
- **Worker transition assistance** - Regulating greenhouse gas emissions will probably shift economic growth to some sectors and green technologies and away from higher carbon intensity industries. Worker training programs could help the California labor force be competitive in these new industries.
- **Administration of a greenhouse gas program** - A portion of revenues could be used to underwrite the State's AB 32 programs and operating costs.
- **Direct emission reductions** - Revenues could be used to purchase greenhouse gas reductions for the sole purpose of retirement, providing direct additional greenhouse gas emission reductions. Potential projects, such as afforestation and reforestation, would both sequester CO₂ and provide other environmental benefits.

Many of the potential uses of revenue would help ARB implement the community benefit section of the AB 32 (HSC §38565) which directs the Board, where applicable and to the extent feasible, to ensure that the greenhouse gas emissions reduction program directs public and private investment toward the most disadvantaged communities in California.

III. EVALUATIONS

The primary purpose of the Scoping Plan is to develop a set of measures that will provide the maximum technologically feasible and cost-effective greenhouse gas emission reductions. In developing this Plan, ARB evaluated the effect of these measures on California's economy, environment, and public health. This Chapter outlines these analyses.

ARB conducted broad -evaluations of the potential impacts of the Scoping Plan, and will conduct more specific evaluations during regulatory development (HSC §38561(d), and HSC §38562(b)). Prior to inclusion of market-based compliance mechanisms in a regulation, to the extent feasible, the Board will consider direct, indirect and cumulative emission impacts, and localized impacts in communities that are already adversely impacted by air pollution (HSC §38570(b)).

Based on the evaluation of the recommendations included in this Proposed Plan, implementing AB 32 is expected to have an overall positive effect on the economy. In addition, implementation of the measures in the Recommended Actions section (Chapter II) will reduce statewide oxides of nitrogen (NOx), volatile organic compounds (VOC) and atmospheric particulate matter (PM) emissions primarily due to reduced fuel consumption, with resulting public health benefits. ARB will also work at the measure-specific level to further maximize the public health benefits that can accompany implementation of greenhouse gas emissions reduction strategies. The following sections provide a summary of the ARB evaluations of the recommended measures included in this Proposed Scoping Plan. More detailed information on the evaluations and their results are provided in Appendices G and H.

A. Economic Modeling

To evaluate the economic impacts of the Scoping Plan, ARB compared estimated economic activity under a business-as usual (BAU) case to the results obtained when actions recommended in this Plan are implemented. The BAU case is briefly described below. The estimated costs and savings used as model inputs for individual measures are outlined in Appendix G, and additional documentation on the calculation of those costs and savings is provided in Appendix I. All dollar estimates are in 2007 dollars.

Under the BAU case, Gross State Product (GSP) in California is projected to increase from \$1.8 trillion in 2007 to almost \$2.6 trillion in 2020. The results of our economic analysis indicate that implementation of the Scoping Plan will have an overall positive net economic benefit for the state. Positive impacts are anticipated primarily because the investments motivated by several measures-result in substantial energy savings that more than pay back the cost of the investments at expected future energy prices.

The business-as-usual case is a representation of what the State of the California economy will be in the year 2020 assuming that none of the measures recommended in the Scoping Plan are implemented. While a number of the measures in the plan will be implemented as the result of existing federal or State policies and do not require additional regulatory action resulting from the implementation of AB 32, they are not included in the BAD case to ensure that the economic impacts of all of the measures in the Scoping Plan are fully assessed.

The BAD case is constructed using forecasts from the California Department of Finance, the California Energy Commission, and other sources, and is described in more detail in Appendix G. ARB used a conservative estimate of future petroleum price in this analysis, \$89 per barrel of oil in 2020. Aspects of the BAD case are subject to uncertainty, for example, the possibility that future energy prices could deviate from those that are included in the BAD case.

1. Macro-economic Modeling Results

Table 24 summarizes the key findings from the economic modeling. Gross State Product, personal income and employment are shown for 2007 and for two cases for 2020, the BAD case and for implementation of the Proposed Scoping Plan. For both the BAD case and the Scoping Plan case, Gross State Product increases by almost \$800 billion between 2007 and 2020, personal income grows by 2.8 percent per year from \$1.5 trillion in 2007 to \$2.1 trillion in 2020, and employment grows by 0.9 percent per year from 16.4 million jobs in 2007 to 18.4 million (BAD) or 18.5 million (Scoping Plan) in 2020. The results consistently show that implementing the Scoping Plan will not only significantly reduce California's greenhouse gas emissions, but will also have a net positive effect on California's economic growth through 2020.

Table 24: Summary of Key Economic Findings from Modeling the Scoping Plan Using E-DRAM

Economic Indicator	2007	Business-as-Usual*		Scoping Plan		
		2020	Average Annual Growth	2020	Change from BAU	Average Annual Growth
Gross State Product (\$Billion)	1,811	2,586	2.8%	2,593	0.3%	2.8%
Personal Income (\$Billion)	1,464	2,093	2.8%	2,109	0.8%	2.8%
Employment (Million Jobs)	16.41	18.41	0.9%	18.53	0.7%	0.9%
Emissions (MMTCO ₂ E)	500"	596		422	-28%	-1.2%**
Carbon Prices (Dollars)				10.00	NA	

Business-as-usual is a forecast of the California economy in 2020 without implementation of any of the measures identified in the Proposed Scoping Plan.

** Approximate value. ARB is in currently estimating greenhouse gas emissions for 2007.

The macroeconomic modeling results presented here understate the benefits of market-based policies, including the cap-and-trade program. Consequently, our estimate of the economic impact of implementing the Scoping Plan understates the positive impact on the California economy. Nonetheless, using the current best estimates of the costs and savings of the measures, which are documented in Appendix I, the models demonstrate that implementing the Plan will have a positive effect on California's economy.

The modeling results reflect a carbon price for the cap-and-trade program of \$10 per-ton. It is important to note that the \$10 per-ton figure does not reflect the average cost of reductions; rather it is the *maximum* price at which reductions to achieve the cap are pursued based on the marketing program.

The positive impacts are largely attributable to savings that result from reductions in expenditures on energy. These savings translate into increased consumer spending on goods and services other than energy. Many of the measures entail more efficient use of energy in the economy, with savings that exceed their costs. In this way, investment in energy efficiency results in money pumped back into local economies. Table 25 summarizes the energy savings that are projected from implementation of the Scoping Plan. These savings are estimated to exceed \$20 billion annually by 2020.

Table 25: Fuels and Electricity Saved in 2020 from Implementation of the Scoping Plan

	Gasoline	Diesel	Electricity	Natural Gas*
Use Avoided"	4,600 million gallons	670 million gallons	74,000GWh	3,400 million therms
Value of Avoided Fuel Use (Million \$2007)	\$17,000	\$2,500	\$6,400***	\$2,700
Percent Reduction from BAU	25%	17%	22%....	24%

Not including natural gas for electric generation.

** These estimates are based on reduced use of these fuels due to increased efficiencies, reduced vehicle miles travelled, etc. Changes to the fuel mix, such as those called for under the RPS or the LCFS, are not included here. These estimates are not the same as the estimates of reduced fuel consumption used in the public health analysis.

*** Based on estimated avoided cost based on average base-load electricity, including generation, transmission and distribution.

.... This is as a percentage of BAU total California electricity consumption in 2020.

2. Impact on Specific Business Sectors

As indicated in Table 26 and Table 27, the effects of the Plan are not uniform across sectors. Implementation of the Scoping Plan would have the strongest positive impact on output and employment for the agriculture, forestry and fishing sector, the

[mance, insurance and real estate sector, and the mining sector. Similar to the statewide economic impacts projected by the model, however, these results also indicate that relative to the business-as-usual case, the impacts due to implementation of the Plan change current growth projections for most sectors by only very small amounts.

Table 26 and Table 27 also show that a decrease in output is projected for the utility and retail trade sectors as compared to the business-as-usual case, and a decrease in employment is projected for the utility sector. In the utility sector, the modeling indicates that implementation of the Scoping Plan would significantly reduce the need for additional power generation and natural gas consumption, which subsequently reduces the growth in output for this sector. This results in a reduction from business-as-usual for economic output and employment of approximately 17 and 15 percent respectively in 2020. The primary reason for these projections is the implementation of efficiency measures and programs for both consumers and producers. While increasing spending on efficiency and renewable energy is expected to increase employment, many of the resulting jobs will not appear in the utility sector.

The retail trade sector, which is projected to grow by nearly 50 percent in both the business-as-usual and the Scoping Plan case, is also projected to experience a slight net decline in output relative to business-as-usual. Since gasoline is considered a consumer retail purchase under this model, the reduced growth is mostly due to the decrease of approximately \$19 billion in retail transportation fuel purchases, which is largely offset by the positive \$14 billion increase in spending at other retail enterprises.

Table 26: Summary of Economic Output by Sector from Modeling the Scoping Plan Using E-DRAM

Sector	Output (\$Billions)			
	2007	Business-as-Usual	Scoping Plan	Percent Change from BAU
Agriculture, Forestry and Fishing	76	109	113	3.9%
Mining	27	29	31	7.2%
Utilities	51	72	60	-16.7%
Construction	114	164	166	1.7%
Manufacturing	673	943	948	0.5%
Wholesale Trade	120	171	173	1.0%
Retail Trade	207	296	291	-1.6%
Transportation and Warehousing	76	109	111	1.9%
Information	164	235	238	1.1%
Finance, Insurance and Real Estate	391	559	572	2.3%
Services	636	910	927	1.9%
Government				
Total	2,535	3,597	3,630	0.8%

Table 27: Summary of Employment Changes by Sector from Modeling the Scoping Plan Using E-DRAM

Sector	Employment (thousands)			
	2007	Business-as-Usual	Scoping Plan	Percent Change from BAU
Agriculture, Forestry and Fishing	398	449	464	3.5%
Mining	26	26	26	1.3%
Utilities	60	67	57	-14.7%
Construction	825	929	934	0.5%
Manufacturing	1,821	2,046	2,057	0.5%
Wholesale Trade	703	791	793	0.1%
Retail Trade	1,688	1,901	1,916	0.8%
Transportation and Warehousing	447	503	510	1.2%
Information	398	448	450	0.4%
Finance, Insurance and Real Estate	911	1,026	1,046	2.0%
Services	5,975	6,729	6,773	0.7%
Government	3,100	3,491	3,502	0.3%
Total	16,352	18,405	18,528	0.6%

3. Household Impacts

Implementation of the Scoping Plan will provide low- and middle-income households savings on the order of a few hundred dollars per year in 2020 compared to the business-as-usual case, primarily as a result of increased energy efficiencies.

Low-Income Households: Based on current U.S. Department of Health and Human Services poverty guidelines, we evaluated the projected impacts of the plan on households with earnings at or below both 100 and 200 percent of the poverty guidelines. For all households, including those with incomes at 100 percent and 200 percent of the poverty level, implementation of the Scoping Plan produces a slight increase in per-capita income relative to the business-as-usual case.

At the same time, the analysis projects an increase of approximately 50,000 jobs available for lower-income workers⁴⁸ relative to **business-as-usual** as a result of implementing the Plan. The largest employment gains come in the retail, food service, agriculture, and health care fields. A decline in such jobs is projected in the retail gasoline sector due to the overall projected decrease in output from this sector. This decline, however, is more than offset by the increases experienced in other areas.

Another important factor to consider when analyzing the impact of the Scoping Plan on households is how it will affect household expenditures. As indicated in Table 28, analysis based on the modeling projections estimates a savings (i.e., reduced expenditures) of around \$400 per household in 2020 for low-income households under both federal poverty guideline definitions. These savings are driven primarily by the implementation of the clean car standards and energy efficiency measures in the Scoping Plan that over time are projected to outweigh potential increases in electricity and natural gas prices that may occur. As the measures in the Scoping Plan are implemented, ARB will work to ensure that the program is structured so that low income households can fully participate in and benefit from the full range of energy efficiency measures. Many of California's energy efficiency efforts are targeted specifically at low income populations, and the CPUC's Long Term Strategic Plan for energy efficiency has redoubled its objective for the delivery of energy efficiency measures to low income populations. Additional information regarding the data in Table 28 can be found in Appendix G.

⁴⁸ Low-income jobs are defined as those with a median hourly wage below \$15 per hour (2007 dollars) based on wage data and staffing pattern projections from the California Employment Development Department. The shares of low-wage occupations for each industry are then applied to the corresponding E-DRAM sector employment projections.

Table 28: Impact of Implementation- of the Scoping Plan on Total Estimated Household Savings in 2020 (2007 \$)

Income at 100% of Poverty Guideline	Income at 200% of Poverty Guideline	Middle Income ⁺	High Income ^{**}	All Households ^{***}
\$400	\$400	\$500	\$500	\$500

All households between 200% and 400% of the poverty guidelines.

All households above 400% of the poverty guidelines.

Average of households of all income levels.

The analysis indicates that implementation of the Scoping Plan is likely to result in small savings for most Californians, with little difference across income levels. Largely due to increased efficiencies, low-income households are projected to be slightly better off from an economic perspective in 2020 as a result of implementing AB32.

Middle-Income Households: Implementation of the plan produces a small increase in household income across all income levels, including middle-income households, relative to the business-as-usual case.⁴⁹ In terms of how jobs for middle-income households⁵⁰ would be impacted, the modeling indicates a slight overall increase of almost 40,000 in 2020.

As shown in Table 28, the analysis projects a net-savings in annual household expenditures of about \$500 in 2020 for middle-income households. These savings are driven by the emergence of greater energy efficiencies that will be implemented as a result of the plan.

4. WCI Economic Analysis

The Proposed Scoping Plan recommends that California develop a cap-and-trade program that links to the broader regional market being developed by the Western Climate Initiative (WCI). In order to examine the economic impacts of WCI program design options, WCI Partner jurisdictions contracted with ICF International and Systematic Solutions, Inc. (SSI) to perform economic analyses using ENERGY 2020, a multi-region, multi-sector energy model. The WCI economic modeling results are reported in full in Appendix D and are discussed in the Background Report on the Design Recommendations for the WCI Regional Cap-and-Trade Program, also included in Appendix D.

To help inform the program design process, the WCI analysis examined the implications of key design decisions, including: program scope, allowance banking,

⁴⁹ For purposes of our analysis we define "middle-income" households as those earning between 200% and 400% of the federal poverty guidelines.

⁵⁰ Hourly wage between \$15 and \$30 per hour.

and the use of offsets. Due to time and resource constraints, the modeling was limited to the eight WCI Partner jurisdictions in the Western Electric Coordinating Council (WECC) area, thereby excluding from the analysis three Canadian provinces, Manitoba, Quebec, and Ontario. Future analyses are planned that will integrate these provinces so that a full assessment of the WCI Partner jurisdictions can be performed.

The WCI modeling work is not directly comparable to the ARB results reported here. The WCI analysis relies on a more aggregated set of greenhouse gas emissions reduction measures rather than the specific individual policies recommended in the Proposed Scoping Plan; it uses somewhat different assumptions regarding what measures are included in the "business-as-usual" case, and it models the entire WECC rather than California. Nevertheless, the results of the WCI modeling provide useful insight into the economic impact of greenhouse gas emissions reduction policies.

Consistent with the conclusions of the ARB evaluation, overall the WCI analysis found that the WCI Partner jurisdictions can meet the regional goal of reducing emissions to 15 percent below 2005 levels by 2020 (equivalent to the AB 322020 target) with small overall savings due to reduced energy expenditures exceeding the direct costs of greenhouse gas emissions reductions. The savings are focused primarily in the residential and commercial sectors, where energy efficiency programs and vehicle standards are expected to have their most significant impacts. Energy-intensive industrial sectors are estimated to have small net costs overall (less than 0.5 percent of output).

The WCI analysis does not examine the potential macroeconomic impacts of the costs and savings estimated with ENERGY 2020. The WCI Partner jurisdictions are planning to continue the analysis so that macroeconomic impacts, such as income, employment, and output, can be assessed. Once completed, the macroeconomic impacts can be compared to previous studies of cap-and-trade programs considered in the United States and Canada.

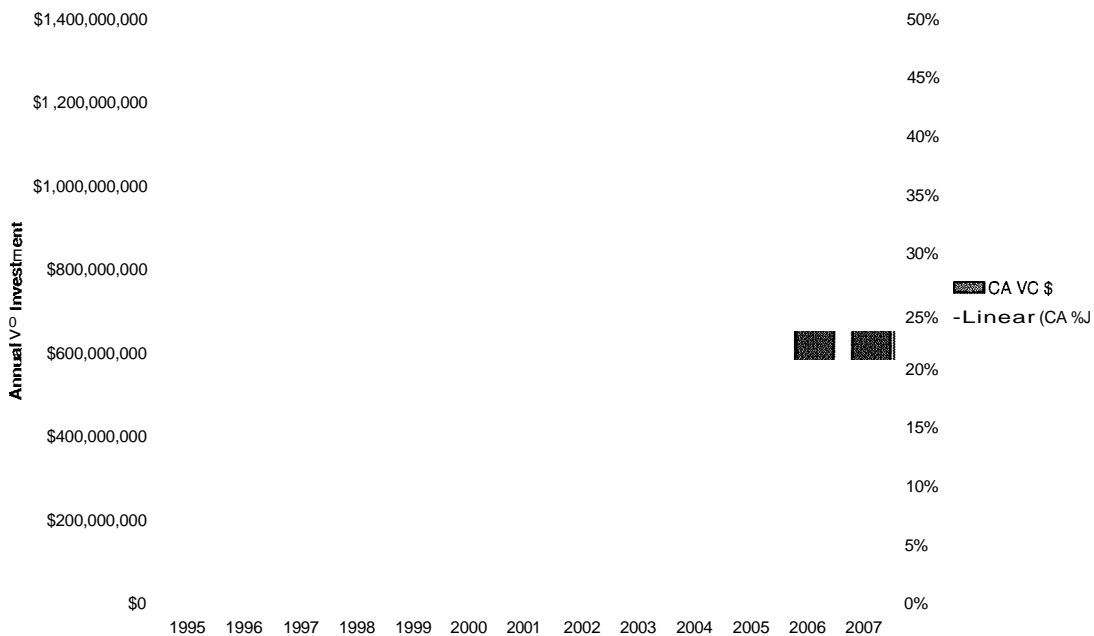
B. Green Technology

The development of green technologies and a trained workforce equipped to design, develop and deploy them will be key to the success of California's long-term efforts to combat global warming. Bold, long-range environmental policies help drive innovation and investment in emission-reducing products and services in part by attracting private capital. Typically, the private sector under invests in research and development for products that yield public benefits. However, when environmental policy is properly designed and sufficiently robust to support a market for such products, private capital is attracted to green technology development as it is to any strategic growth opportunity.

California's leadership in environmental and energy efficiency policy has helped attract an increasing share of venture capital investment in green technologies. According to statistics from PricewaterhouseCoopers and the National Venture Capital Association, California's

share of U.S. venture capital investment in innovative energy technologies increased dramatically from 1995 to 2007 (see Figure 5 below).⁵¹ The same period saw a stream of pioneering environmental policy initiatives, including energy efficiency codes for buildings and appliances, a renewables portfolio standard for electricity generation, climate change emissions standards for light-duty automobiles and, most recently, AB 32. Flows of venture capital into California are escalating as a direct result of the focus on reductions of greenhouse gas emissions. As mentioned above, California captured the largest single portion of global venture capital investment (\$800 million out of two billion dollars) during the second quarter of 2008.

Figure 5
California's Growing Share of Venture Capital Investment
in Energy Innovation, 1995-2007 (current \$, % share)



Source: PricewaterhouseCoopers MoneyTree Report, available at: [<https://www.pwcmoneytree.com>].

A survey of clean technology investors by Global Insight and the National Venture Capital Association found that public policy influences where venture capitalists invest,⁵² Furthermore, investments in green technology solutions produce jobs at a higher rate than

⁵¹ Based on historical trend data for the 'IndustrialEnergy' industry for California and the United States from the PricewaterhouseCoopers MoneyTree Report.

<https://www.pwcmoneytree.com/IMTPublic/ns/nav.jsp?page=historical> (accessed October 12, 2008)

⁵² Clean Tech Entrepreneurs & Cleantech Venture Network LLG. *Creating Cleantech Clusters: 2006 Update*. May 2006. p.43

<http://www.e2.org/lex/2006%20National%20Cleantech%20FORMATTED%20FINAL.pdf> (accessed October 12, 2008)

investments in comparable conventional technologies.⁵³ Venture capitalists estimate that each \$100 million in venture capital funding, over a period of two decades, helps create 2,700 jobs, \$500 million in annual revenues, and many indirect jobs.⁵⁴

Access to capital controlled by institutional investors is also enhanced by policies that encourage early adoption of green technologies. When California-based corporations use green technologies to reduce their exposure to climate change risk, institutional investors reward them by facilitating their access to capital. The Investor Network on Climate Risk - including institutional investors with more than \$8 trillion of assets under management - endorsed an action plan in 2008 that calls for requiring asset managers to consider climate risks and opportunities when investing; investing in companies developing and **deploying** clean technologies; and expanding climate risk scrutiny by investors and analysts.⁵⁵

Additional capital for green technologies helps drive increased employment, both indirectly, as energy savings are plowed back into other sectors of the economy, and directly, as new green products are successfully commercialized.

McKinsey & Company projects average annual returns of 17 percent on global investments in energy productivity, and estimates the global investment opportunity at \$170 billion annually through 2020.⁵⁶ Meanwhile, global investment in energy efficiency and renewable energy has grown from \$33 billion to more than \$148 billion in the last four years. Beyond 2020, green technologies are expected to attract investment of more than \$600 billion annually.⁵⁷ In short, green technology is now a *bonafide* global growth industry.

Today, green technology businesses directly employ at least 43,000 Californians, primarily in energy efficiency and energy generation, according to a 2008 study from the California Economic Strategy Panel. Green jobs are concentrated in manufacturing (41 percent), and

⁵³ Report of the Renewable and Appropriate Energy Laboratory. *Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Generate?* Energy and Resources Group/Goldman School of Public Policy at University of California, Berkeley. April 13, 2004. <http://rael.berkeley.edu/old-site/renewables.jobs.2006.pdf> (accessed October 12,2008)

⁵⁴ Report prepared for the National Venture Capital Association. *Venture Impact 2004: Venture Capital Benefits to the U.S. Economy*. Prepared by: Global Insight. June 2004. http://www.globalinsight.com/publicDownload/genericContent/07-20-04_fullstudy.pdf (accessed October 12, 2008)

⁵⁵ The Investor Network on Climate Risk. *Final Report, 2008 Investor Summit on Climate Risk*. February 14, 2008. <http://www.ceres.org/Document.Doc?id=331> (accessed October 12,2008)

⁵⁶ McKinsey Global Institute. *The Case for Investing in Energy Productivity*. McKinsey & Company. February, 2008. p.8 http://www.mckinsey.com/mgi/reports/pdfs/Investing_Energy_Productivity/Investing_Energy_Productivity.pdf (accessed October 12,2008)

⁵⁷ United Nations Environment Programme-New Energy Finance Ltd. *Global Trends in Sustainable Energy Investment 2008: Analysis of Trends and Issues in the Financing of Renewable Energy and Energy Efficiency* 2008. p.12 ISBN: 978-92-807-2939-9 http://www.unep.fr/energy/act/finlsefi/Global_Trends_2008.pdf (accessed October 12,2008)

professional, scientific and technical services (28 percent), with median annual earnings of \$35,725 and \$56,754, respectively.⁵⁸ By 2030, under a moderate growth scenario, green businesses nationwide are expected to generate revenues of \$2.4 trillion, (2006 dollars), and employ 21 million Americans.⁵⁹

As a leader in green technology development and use, California has already realized substantial economic benefits from the adoption of energy efficiency policies. State energy efficiency measures have saved enough energy over the past 30 years to avoid construction of two dozen 500-megawatt power plants. Today, California's per capita electricity consumption is 40 percent below the national average, and the carbon intensity of California's economy is among the lowest in the nation.⁶⁰

Renewable energy, such as solar, wind, biomass, geothermal, will also bring new employment opportunities to Californians while spurring economic growth. California enjoys significant comparative advantages for renewable energy: concentrated innovation resources, a large potential customer base, key natural resources such as reliable solar and wind, and supportive regulatory programs, including the California Renewables Portfolio Standard, the Million Solar Roofs Initiative, the California Global Warming Solutions Act of 2006, and the Solar Water Heating and Efficiency Act of 2007.

Other researchers have estimated that under a national scenario with 15 percent renewables penetration by 2020, California will experience a net gain in direct employment of 140,000 jobs.⁶¹ Because investments in green technologies produce jobs at a higher rate than investments in conventional technologies, jobs losses that occur in traditional fossil fuel industries will be more than compensated for by gains in the clean energy sector.

Furthermore, if California's renewable energy suppliers field products that are sufficiently competitive to penetrate the export market, employment and earnings dividends for the state will also increase. California renewable energy industries servicing the export market can generate up to 16 times more employment than those that only manufacture for domestic

⁵⁸ California Economic Strategy Panel with Collaborative Economics. *Clean Technology and the Green Economy*. March 2008. P.14-15 [http://www.labor.ca.gov/panelJpdfIDRAff Green Economy 031708.pdf](http://www.labor.ca.gov/panelJpdfIDRAff%20Green%20Economy%20031708.pdf) (accessed October 12, 2008)

⁵⁹ The American Solar Energy Society. *Renewable Energy and Energy Efficiency: Economic Drivers for the 21st Century*. 2007. p.39 ISBN 978-0-89553-307-3 <http://www.ases.org/images/stories/ASES-JobsReport-Final.pdf> (accessed October 12, 2008)

⁶⁰ California Energy Commission. *2007 Integrated Energy Policy Report*. Document No. CEC-100-2001-008-CMF. 2007. p.3 <http://www.energy.ca.gov/2007publications/CEC-100-2007-008/CEC-100-2007-008-CMF.PDF> (accessed October 12, 2008)

⁶¹ Tellus Institute and MRG Associates. *Clean Energy: Jobs for America's Future*. As cited in: Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Generate? Energy and Resources Group/Goldman School of Public Policy at University of California, Berkeley. April 13, 2004. <http://rael.berkeley.edu/old-site/renewables.jobs.2006.pdf> (accessed October 12, 2008)

consumption, according to a study by the Research and Policy Center of Environment California.⁶²

C. Cost-Effectiveness

As noted in several provisions of AB 32, cost-effectiveness is an important requirement to be considered in the design and implementation of emission reduction strategies. (See HSC §§38505, 38560, 38561, 38562.) AB 32 defines "cost-effective" or "cost-effectiveness" as "the cost per unit of reduced emissions of greenhouse gases adjusted for its global warming potential." (HSC §38505(d). This definition specifies the metric (i.e., dollars per ton) by which the Board must express cost-effectiveness, but it does not provide criteria to assess if a regulation is or is not cost-effective. It also does not specify whether there should be a specific upper-bound dollar per ton cost that can be considered cost-effective, or how such a bound would be determined or adjusted over time. ARB has investigated different approaches that could be used to evaluate the cost-effectiveness of regulations and is recommending the following approach.

The estimated cost per ton of greenhouse gas emissions reduced by the measures recommended in this Plan ranges from \$-408 (net savings) to \$133, with all but one (the Renewables Portfolio Standard) costing less than \$55 per ton. The RPS is being implemented for energy diversity purposes, not just greenhouse gas reductions, and the \$133 per ton figure does not take these other benefits into account. Therefore, it should not be used as a reference to define the range of cost-effective greenhouse gas measures. These estimates are based on the best information available as ARB prepared this Proposed Plan. Updated estimates and greater certainty will be provided as the measures are further developed during the rulemaking process.

In the meantime, the current estimates provide a range illustrating the cost per ton of the mix of measures that collectively meet the 2020 target. This range will assist the Board in evaluating the cost-effectiveness of individual measures when considering adoption of regulations. The range of acceptable cost-effectiveness may change if effective lower-cost measures and options are identified. Because both the projections of "business-as-usual" 2020 emissions and the degree of reductions from any given measures may be greater or less than current estimates, the determination should remain flexible to accommodate a higher or lower estimate of cost-effectiveness. In addition, the approach must provide flexibility to pursue measures that simultaneously achieve policy objectives other than greenhouse gas emissions reduction (such as energy diversity).

The criteria for judging cost-effectiveness will be updated as additional technological data and strategies become available. As ARB moves from adoption of the Scoping Plan to

⁶² Environment California Research and Policy Center. *Renewable Energy and Jobs. Employment Impacts of Developing Markets for Renewables in California*. July 2003. As cited in: *Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Generate?* Energy and Resources Group/Goldman School of Public Policy at University of California, Berkeley. April 13, 2004. <http://raei.berkeley.edu/old-site/renewables.jobs.2006.pdf> (accessed October 12, 2008)

developing specific regulations, and as regulations continue to be adopted, updated cost-effectiveness estimates will be established in a rigorous and transparent process with full stakeholder participation. As ARB progresses from proposed measures and estimated costs to actual regulations, the comparison of cost-effectiveness would move toward the well established practice of comparing the cost-effectiveness of new regulations to the cost-effectiveness of previously enacted and/or similar regulations. This approach is consistent with how cost-effectiveness is evaluated for strategies to reduce criteria and toxic pollutants.

D. Small Business Impact

Small businesses play an important role in California's economy. As required under AB 32, ARB analyzed the impact that implementation of the Scoping Plan would have on small businesses in the state. The analysis indicates that the primary impacts on small businesses as a result of AB 32 will come in the form of changes in the costs of goods and services that they procure, and in particular, changes in energy expenditures. Due to the number of measures in the plan that will deliver significantly greater energy efficiencies, our analysis projects that implementation of the plan will have a positive impact on small business in California even after taking into account the higher per-unit energy prices that are likely to occur between now and 2020. Small businesses also will benefit as a result of the robust economic growth and the increases in jobs, production, and personal income that are projected between now and 2020 as AB 32 is implemented. Additional information is provided in Appendix G.

Recent analysis from Energy and Environmental Economics, Inc. (E3) forecasts that a package of greenhouse gas emissions reduction measures similar to those recommended in this Plan would deliver a five percent decrease in electricity expenditures for the average California electricity customer relative to business-as-usual in 2020.⁶³ This projection is based on the assumption that increases in electricity prices will be more than offset by the continued expansion of energy efficiency measures and that more efficient technologies will be developed and implemented.⁶⁴ For purpose of this analysis, expenditures on natural gas are assumed to remain the same, balancing the projected 29 percent decrease, in natural gas consumption in California with the model's projected natural gas price increase of almost 9 percent.

Based on this assessment, implementation of the Scoping Plan will likely have minor but positive impacts on small businesses in the state. These benefits are attributable primarily to the measures in the plan that will deliver significantly greater energy and fuel efficiencies. Even when higher per unit energy prices are taken into account, these efficiencies will decrease overall energy expenditures for small businesses. Additionally, as previously described, the California economy is projected to experience robust economic growth

⁶³ Based on their GHG Calculator, CPUC/CEC GHG Docket (CPUC Rulemaking.06.04.009,CEC Docket 07-OIIP-OI), available at http://www.ethree.com/cpuc_ghg_model.html.

⁶⁴ The E3 analysis focuses on direct programmatic measures and does not include the incremental price impact of the cap-and-trade program, which will depend upon allowance price, allocation strategy, the capped sector industry response, and other program design decisions.

between now and 2020 as AB 32 is implemented. Small businesses will experience many of the benefits associated with this growth in the form of more jobs, greater production activity, and rising personal income.

The projected decrease in electricity expenditures is especially important for small businesses since they typically spend more on energy as a percentage of revenue compared to larger enterprises. For example, firms with a single employee spend approximately 3.3 percent of each sales dollar on electricity, while businesses with between ten and forty-nine employees spend around 1.2 percent. As a result, smaller businesses are likely to experience a greater relative benefit from decreased energy expenditures relative to their larger counterparts.

From the broader economic perspective, these changes will make California more competitive as a location for small business, moving it from 7th highest to 19th among all states in terms of the percentage of revenue that businesses expend on electricity.⁶⁵ As was noted above for low income households, care must be taken to ensure that the program is structured to allow small businesses to participate in and benefit from the energy efficiency measures.

While ARB's analysis indicates a positive impact on small businesses from AB 32 implementation, to ensure that these benefits are realized to the fullest potential it will take additional outreach and communication efforts on the part of ARB and many other state and local entities. There are a number of existing programs that are designed to help small businesses achieve greater efficiencies in energy use. These programs can be enhanced and expanded upon, and new programs and efforts can be developed to ensure that all small businesses in California are aware of and able to take cost-effective steps to reduce energy use and enjoy the associated economic savings. For example, as discussed more completely in Chapter IV, ARB and our partners in State government are working together to develop an on-line small business "toolkit" designed for small and medium-sized businesses to provide a one-stop shop of technical and financial information resources. As further development and implementation of the measures in the plan proceeds, we will work with other state and local partners to ensure that small businesses can both benefit from and play a role in helping to achieve our greenhouse gas emission reduction requirements.

E. Public Health/Environmental Benefits Analyses

AB 32 requires ARB to evaluate the environmental and public health impacts of the Scoping Plan. The analysis of this plan is focused primarily on the quantification of public health benefits from air quality improvements that would result from implementation. Unlike traditional pollutants and toxic emissions, global warming pollutants do not typically have localized impacts. At ambient levels, carbon dioxide, which makes up over 80 percent of global warming pollutants in California, has no direct environmental or public health consequences. Climate change caused by greenhouse gas pollutants emitted in another state

⁶⁵ Although the natural gas data is less specific, a similar scenario is expected where increased prices are typically offset by greater efficiencies for most small businesses.

or country has the same potential to damage our public health and the environment as does climate change due to pollutants emitted within California. Although this analysis does not consider the public health impacts of climate change, the potential public health impacts are great, and have been well documented elsewhere. However, many of the measures aimed at reducing global warming pollutants also provide co-benefits to public health and California's natural resources.

The environmental and cumulative impacts of the Plan are discussed in the California Environmental Quality Act (CEQA) document that is included in Appendix J. As the Scoping Plan is implemented, and specific measures are developed, ARB will conduct further CEQA analyses, including cumulative and multi-media impacts. As ARB further develops its approach for consideration of these issues in future rulemakings, and updates needed analytical tools and data sets, we will consult with outside experts and the EJAC. ARB recognizes that the adoption of the Scoping Plan will launch a variety of regulatory proceedings in many different venues. ARB will work closely with other California State agencies including: the Office of Planning and Research, Environmental Protection Agency, Resources Agency, Integrated Waste Management Board, Department of Public Health, Office of Environmental Health Hazard Assessment, State Water Resources Control Board, Department of Toxic Substances Control, Department of Water Resources, Board of Forestry, Department of Fish and Game, Public Utilities Commission, California Energy Commission, and others to identify and address potential multi-media environmental impacts early in the regulatory development process.

California's actions to reduce greenhouse gas emissions will help transition the State to new technologies, improved efficiencies, and land use patterns also necessary to meet air quality standards and other public health goals. California's challenging public health issues associated with air pollution are already the focus of comprehensive regulatory and incentive programs. These programs are reducing smog forming pollutants and toxic diesel particulate matter at a rapid pace. However, to meet increasingly stringent air quality standards and air toxics reduction goals, transformative changes are needed in the 2020 timeframe and beyond. Implementation of AB 32 will provide additional support to existing State efforts devoted to protecting and improving public health.

1. Key Air Quality-Related Public Health Benefits

The primary direct public health benefits of the Proposed Scoping Plan are reductions in smog forming emissions and toxic diesel particulate matter. The most significant reductions are of oxides of nitrogen (NOx), which forms both ozone and particulate pollution (PM2.5), and directly emitted PM2.5, which includes diesel particulate matter. The analysis focuses on PM2.5 impacts and quantifies 2020 public health benefits of this plan in terms of avoided premature deaths, hospitalizations, respiratory effects, and lost work days. Additional benefits associated with the reductions in ozone forming emissions were not quantified since statewide 2020 photochemical modeling is not available.

The estimated air quality-related public health benefits of the Proposed: Scoping Plan are above and beyond the much greater benefits of California's existing programs, which are reducing air pollutant emissions every year. This continuing progress is the result of California's plans for meeting air quality standards ("State Implementation Plans" or SIPs), reducing emissions from goods movement activities, and addressing health risk from diesel particulate matter. These programs address both existing and new sources of air pollution, taking into account population and economic growth. The additional benefits of the Proposed Scoping Plan in 2020 are significant, and in the longer term, can be expected to increase with further reductions in fossil fuel combustion, the primary basis for the estimated public health benefits.

The recommended measures in the Proposed Scoping Plan that reduce smog forming ("criteria") pollutants are shown in Table 29 along with the estimated reductions. Statewide, these measures would reduce approximately 61 tons per day of NOx and 15 tons per day of PM2.5 in 2020. As shown in Table 30, this equates to an estimated air quality-related public health benefit of 400 avoided premature deaths statewide. In comparison, reductions in PM2.5 from California's existing programs and 2007 SIP measures are estimated to result in 3,700 avoided premature deaths statewide in the same timeframe.

Table 29: Statewide Criteria Pollutant Emission Reductions in 2020 from Proposed Scoping Plan Recommendation⁶⁶
(tons per day)

Measure	NOx	PM2.5
Light-Duty Vehicle		
• Pavley I and Pavley II GHG Standards	1.6	1.4
• Vehicle Efficiency Measures		
Goods Movement Efficiency Measures	16.9	0.6
Medium and Heavy-Duty Vehicle GHG Emission Reduction		
• Aerodynamic Efficiency	5.6	0.2
• Hybridization		
• Engine Efficiency		
Local Government Actions and Regional Targets	8.7	1.4
Energy Efficiency and Conservation (Electricity)	7.0	4.0
Energy Efficiency and Conservation (Natural Gas)	IOA	0.8
Solar Water Heating	0.3	0.03
Million Solar Roofs	1.0	0.6
Renewables Portfolio Standard	9.8	5.6
Total	61	15

⁶⁶ Table 29 does not include the criteria pollutant co-benefits of additional greenhouse gas reductions that would be achieved from the proposed cap-and-trade regulation because we cannot predict in which sectors they would be achieved.

Table 30: Estimates of Statewide Air Quality-Related Health Benefits in 2020

Health Endpoint	Health Benefits of Existing Measures and 2007 SIP <i>mean</i>	Health Benefits of Recommendations in the Proposed Scoping Plan <i>mean</i>
Avoided Premature Death	3,700	400
Avoided Hospital Admissions for Respiratory Causes	770	84
Avoided Hospital Admissions for Cardiovascular Causes	1,400	150
Avoided Asthma and Lower Respiratory Symptoms	110,000	11,000
Avoided Acute Bronchitis	8,700	910
Avoided Work Loss Days	620,000	67,000
Avoided Minor Restricted Activity Days	3,600,000	380,000

In addition to the quantified air-quality-related health benefits, our analysis indicates that implementation of the Proposed Scoping Plan can deliver other public health benefits as well. These include potential health benefits associated with local and regional transportation-related greenhouse gas targets that can facilitate greater use of alternative modes of transportation, such as walking and bicycling. These types of moderate physical activities reduce many serious health risks including coronary heart disease, diabetes, hypertension and obesity.⁶⁷ Finally, it is important to note that the steps California is taking to address global warming, along with actions by other regions, states, and nations, will help mitigate the public health effects of heat waves, more widespread incidence of illness and disease, and other potentially severe impacts.

The measures in the Proposed Scoping Plan are designed primarily to help spur the transition to a lower carbon economy. However, in addition to improving air quality, these measures can also improve California's environmental resources, including land, water, and native species. Land resources will be affected by regional transportation-related targets leading to improved land use planning, and forest carbon sequestration targets which can result in better stewardship of California lands and reduced wildfire risk. A number of conservation measures will aid in effective management of the State's precious water resources. Demand for waste disposal and hazardous materials should decrease as measures to encourage recycling and reuse transform our wastes into fuel, energy, and other useful products are implemented. Additional analysis of the way that implementation of the Scoping Plan will impact these environmental resources will be conducted as we proceed. Many of these measures serve the dual purpose of mitigating greenhouse gas emissions and helping California adapt to the impacts of climate change.

⁶⁷ Appendix H contains a reference list of studies documenting the public health benefits of alternative transportation.

2. Approach

ARB quantified the potential reductions of NO_x and PM_{2.5} from implementation of the Proposed Plan's recommendations, and the public health benefits associated with the resulting potential air quality improvement. These analyses compare NO_x and PM_{2.5} emissions in 2020 with the implementation of the Scoping Plan with NO_x and PM_{2.5} emissions in 2020 in the absence of the Scoping Plan - a "business-as-usual" scenario. The methodology used to evaluate the public health benefits of the emission reductions is similar to the methodology used in ARB's 2006 Goods Movement Emission Reduction Plan (GMERP).⁶⁸ This methodology is based on a peer-reviewed methodology developed by the U.S. Environmental Protection Agency (U.S. EPA). ARB augmented U.S. EPA's methodology by incorporating the result of new epidemiological studies relevant to California's population, including regionally specific studies, as they became available.

AB 32 directs ARB to conduct several levels of analysis as we proceed through the development and implementation of a comprehensive greenhouse gas emissions reduction strategy. As part of the Scoping Plan development, ARB is required to assess both the economic and non-economic impacts of the plan as noted above. Additionally, AB 32 requires ARB to undertake additional analysis at the time of adoption of regulations, including market-based compliance mechanisms.

Although not yet at the stage of regulatory development and adoption, in this analysis ARB conducted an evaluation of the air quality-related public health benefits associated with the Proposed Scoping Plan based on a community level emissions analysis example. As regulations that rely on market-based compliance mechanisms are further developed for consideration by the Board, more detail about the specific regulatory proposals will be developed, enabling ARB to more closely evaluate the potential for direct, indirect and cumulative impacts.

3. Existing Programs for Air Quality Improvement in California

The public health analysis of the Proposed Scoping Plan presents air-quality benefits that will occur in addition to the benefits of California's comprehensive air quality programs designed to meet health-based standards and reduce health risk from air toxics. It is also important to note that under both a "business-as-usual" scenario and under the implementation of the Proposed Scoping Plan, the population and economy of California are projected to continue to grow. New businesses and industries will continue to be sited in California, bringing both economic opportunity and potential environmental impacts. Federal, State, and local laws and regulations have established requirements to ensure that new and modified sources of pollution are carefully evaluated and that significant impacts are mitigated. Emissions from existing businesses are also tightly controlled by local air pollution control districts.

⁶⁸ Air Resources Board. Technical Supplement on Health Analysis. *Technical Supplement on Quantification of the Health Impacts and Economic Valuation of Air Pollution from Ports and Goods Movement in California*. March 2006 <http://www.arb.ca.gov/planning/gmem/gmem-htm> (accessed October 12, 2008)

Statewide programs are in place to reduce emissions from cars, trucks, and off-road equipment, along with smog check, cleaner gasoline and diesel fuels, and regulations to reduce evaporative emissions from consumer products, paints, and refueling. Additional information about the existing regulatory framework for sources of air pollution is provided in Appendix H.

It is important to evaluate the air quality and public health benefits of the Proposed Scoping Plan in the context of the State's on-going air quality improvement efforts. California's long-standing air pollution control programs have substantially improved air quality in the state and will continue to do so in the future. By 2020, these programs will deliver reductions in statewide NOx emissions of 441 tons per day and direct fine particle emission reductions of 34 tons per day. Through 2020, three key ARB efforts will deliver deep reductions in air pollutant emissions despite continuing growth:

- Diesel Risk Reduction Plan
- Goods Movement Emission Reduction Plan
- 2007 State Implementation Plan

Measures in these plans will result in the accelerated phase-in of cleaner technology for virtually all of California's diesel engine fleets including trucks, buses, construction equipment, and cargo handling equipment at ports. Adoption and implementation of these and other measures are critical to achieving clean air and public health goals statewide.

The U.S. Environmental Protection Agency has set a new, more stringent, national ambient air quality standard for ozone that will have compliance deadlines well past 2020 for the most severely impacted areas like southern California.⁶⁹ The unmitigated impacts of climate change will make it harder to meet this standard and to provide healthful air to Californians.

4. Statewide Analysis

For this evaluation, ARB examined the recommended measures to determine the potential for impacts on air, land, water, native species and biological resources, and waste and hazardous materials. Local government, State government, and green building sectors were not included in this evaluation as they represent means of implementation of the greenhouse gas emission reduction measures. As noted, the main focus of this analysis is on air quality. To the extent feasible, ARB quantified estimated emissions reductions in criteria pollutants associated with each recommended measure except cap-and-trade. Reductions in NOx and PM2.5 were used to estimate public health benefits. The estimated statewide reductions are

⁶⁹ U.S. Environmental Protection Agency. *National Ambient Air Quality Standards for Ozone. Final Rule.* 73 Federal Register 16436. March 27, 2008. <http://www.epa.gov/fedrgstr/EPA-AIR/2008/March/Day-27/a5645.pdf> (accessed October 12, 2008)

61 tons per day of NOx and 15 tons per day of PM2.5. Further analysis of the potential criteria pollutant benefits of a cap-and-trade program will be done as part of regulatory development.

5. Regional Assessment: South Coast Air Basin Example

In order to assess potential air quality benefits of the Proposed Scoping Plan on a regional level, ARB evaluated associated criteria pollutant reductions in the South Coast Air Basin as an example case. Existing programs will reduce current NOx emissions by almost 50 percent in 2020. With the new 2007 SIP measures, NOx emissions will be reduced almost 60 percent. Because of the large population and high pollutant concentrations in this region, greater benefits occur from each ton of pollution reduced. The estimated air quality-related public health benefits of the Proposed Scoping Plan for the South Coast region are shown in Table 31. The significant air quality-related public health benefits in this region are largely attributed to the additional reductions in PM2.5.

Table 31: Estimated Air Quality-Related Health Benefits of Existing Program, 2007 SIP, and Proposed Scoping Plan in the South Coast Air Basin, 2020

Health Impacts / Scenario	Benefits from Existing Program	Additional Benefits from 2007 SIP	Additional Co-Benefits from Proposed Scoping Plan
Premature Deaths Avoided	1,600	920	200
Hospitalizations Avoided - Respiratory	330	200	42
Hospitalizations Avoided - Cardiovascular	610	360	78
Asthma & Lower Respiratory Symptoms Avoided	46,000	28,000	5,900
Acute Bronchitis Avoided	3,800	2,300	490
Work Loss Days Avoided	270,000	160,000	35,000
Minor Restricted Activity Days Avoided	1,600,000	940,000	200,000

6. Community Level Assessment: Wilmington Example

ARB also conducted an evaluation of the potential air quality impacts of the Proposed Scoping Plan in the community of Wilmington as an illustration of the potential for localized impacts. Wilmington is in southern Los Angeles County and includes a diverse range of stationary and mobile emissions sources, including the ports of Los Angeles and Long Beach, railyards, major transportation corridors, refineries, power plants, and other industrial and commercial operations. Like the regional analysis, additional emission reductions from the 2007 SIP were estimated and show significant reductions in Wilmington by 2020 - approximately a 45 percent reduction in NOx and a 40 percent reduction in directly-emitted PM2.5. Mobile source emissions are projected to continue to be proportionately greater than stationary source emissions in 2020 even as mobile source emissions decline:

For this assessment, ARB evaluated criteria pollutant emission reductions in the Wilmington study area assuming that the source-specific quantified measures are implemented, including measures to reduce emissions from oil and gas extraction and refineries. It was further assumed that the non-source specific program elements, such as the proposed cap-and-trade program, result in a 10 percent reduction in fuel combustion by affected sources within the study area. For example, it is estimated that industrial sources would achieve greenhouse gas emission reductions through efficiency measures that reduce on site fuel use by 10 percent either in response to a cap-and-trade program, or due to the results of the facility energy efficiency audits. While it is likely that the actual onsite reductions will differ across individual facilities from the assumed uniform ten percent reduction,⁷⁰ the analysis identifies how reductions at these facilities affect the overall level of co-benefits.

The estimated NOx co-benefit of about 1.7 tons per day is small relative to the projected reductions of 24 tons per day that will occur as a result of the SIP and other measures. For example, an 8 ton per day NOx reduction is expected from cleaner port trucks. In comparison, the potential NOx benefit from a 10 percent efficiency improvement in major goods movement categories is estimated at about 1.5 tons per day. The estimated PM2.5 co-benefits, on the order of 0.12 tons per day, are also small relative to the projected reductions of 2.3 tons per day that will occur as a result of the SIP and other measures. Approximately 30 percent (0.04 ton per day) of the PM 2.5 co-benefit reduction is associated with assumed energy efficiency measures at the four large refineries in the study area, while another 30 percent would occur due to a 10 percent efficiency improvement by goods movement sources.

The co-benefit emissions reductions in the study area would produce regional air quality-related health benefits. A relatively small portion of these benefits would occur in the study area (approximately 300,000 area residents). Health benefits due to reductions in NOx are mostly at the regional levels, since NOx emissions have usually travelled some distance before they are transformed into PM via atmospheric reactions. Point source combustion PM emissions persist in the atmosphere and increase exposures both in the area where they are emitted and broadly throughout the region. Based on previous modeling studies of the impact of port and rail yard PM emissions in the South Coast Air Basin conducted by ARB, PM exposures will be reduced far beyond the study area, and a majority of the health benefits are expected to occur in areas outside of the Wilmington community.⁷¹

Using the previously described methodology that correlates emission reductions in the air basin with expected regional health benefits there would be an estimated

⁷⁰ The reductions at anyone facility could be much greater or lesser than 10 percent. For example, very small or no reductions might occur because available cost-effective industrial emission reductions have already been implemented at a particular site.

⁷¹ ARB analysis indicates that about 20 percent of the health benefits would occur in the Wilmington area.

11 avoided premature deaths attributed to emission reductions that occur in Wilmington as a result of the Scoping Plan.⁷²

F. Summary of Societal Benefits

AB 32 requires ARB to "consider the overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health" (HSC § 38562(b)(6)) when developing regulations to implement the Scoping Plan. ARB conducted an initial assessment of societal benefits associated with AB 32 implementation. This section summarizes those that have been identified during development of the Scoping Plan, including diversification of energy sources, mobility, regressivity, and job creation. More detailed economic and environment/public health analyses can be found in Appendix G and H, respectively. The impact of low income households (regressivity), impacts on small businesses, and impact on jobs are described in the Economic Analysis section and Appendix G.

1. Energy Diversification

Generally, energy-related measures in this Proposed Scoping Plan are expected to result in a transformation of the State's energy portfolio, driven primarily by the Low Carbon Fuel Standard (LCFS), which addresses transportation fuel, and the 33 percent RPS, which increases renewably-produced electricity production and distribution to households and businesses.

The LCFS aims to achieve at least a 10 percent reduction in the carbon intensity of California's transportation fuels by 2020. As the State moves toward less dependence upon one source of fuel for transportation, our economy will be less at risk from significant fluctuations in fuel prices. Measures within the Scoping Plan will force energy diversification in California toward low-carbon intensive energy sources and encourage significant growth in infrastructure, capital, and investment in biofuels.

The move toward 33 percent renewables will, by definition, increase the diversification of California's electrical supply. Increased use of wind, solar, geothermal and biomass (including from the organic fraction of municipal solid waste) generation will all add to ensuring the state has a broader portfolio of energy inputs.

Based on ARB's economic analysis, the combined energy diversification and increased energy efficiency expected from implementation of the Scoping Plan is predicted to result in: a 25 percent decrease in gasoline usage (4.6 billion gallons), a 17 percent decrease in diesel fuel use (670 million gallons), a 22 percent decrease in electricity (74,000 GWh reduction) and a 24 percent reduction in natural gas (3,400 therms).

⁷² See Appendix H

The cap-and-trade program, offsets, and other measures that contain market-based features may also help diversify California's energy portfolio by incentivizing the development and deployment of clean and efficient energy generating technologies.

2. Mobility and Shifts in Land Use Patterns

Mobility is analyzed through multiple approaches in the Proposed Scoping Plan. Appendix C includes an analysis of a proposed measure for regional transportation-related greenhouse targets. Reductions in vehicle miles traveled (VMT) are expected to result from regional and local planning which target land use, building and zoning improvements.

As the Scoping Plan is implemented, measures that support shifts in land use patterns are expected to emphasize compact, low impact growth in urban areas over development in greenfields. Communities could realize benefits, such as improved access to transit, improved jobs-housing balance, preservation of open spaces and agricultural fields, and improved water quality due to decreased runoff. Local and regional strategies promoting appropriate land use patterns could encourage fewer miles traveled, lowering emissions of greenhouse gases, criteria pollutants and PM. More compact communities with improved transit service could increase mobility, allowing residents to easily access work, shopping, childcare, health care and recreational opportunities.

Furthermore, if open spaces and desirable locations become more accessible and communities are designed to encourage walkability between neighborhoods and shopping, entertainment, schools and other destinations, residents are likely to increase their levels of physical activity. Research shows that regular physical activity can reduce health risks, including coronary heart disease, diabetes, hypertension, anxiety and depression, and obesity. Measures in the Proposed Scoping Plan encourage Californians to use alternatives to personal vehicle travel that could result in increased personal exercise. To complement these changes, future community developments may evolve to include trails and pedestrian access to major centers. However, where compact development may increase proximity to large sources of pollution, such as high traffic arterials, distribution centers, and industrial facilities, it will be critical to analyze the anticipated and unanticipated impacts and benefits, to ensure that increases in exposure to vehicular air pollution and other toxics and particulates do not occur.

G. California Environmental Quality Act Functional Equivalent Document

The California Environmental Quality Act (CEQA) and ARB policy require an analysis to determine the potential adverse environmental impacts of proposed projects. ARB's analysis of the potential adverse environmental impacts of the Proposed Scoping Plan is presented in Appendix J. The analysis summarizes and discusses the specific strategies in the Scoping Plan that, if adopted and implemented, will reduce greenhouse gas emissions throughout the

state. The evaluation is programmatic by necessity; it allows consideration of broad policy alternatives and program-wide mitigation measures at a time when an agency has greater flexibility to deal with basic problems of cumulative impacts. A programmatic document also plays an important role in establishing a structure within which future reviews of related actions can be effectively conducted. The Secretary of California's Resources Agency determined that ARB meets the criteria for a Certified Regulatory Program and requires ARB to prepare a substitute document. This functionally equivalent document (FED) is intended to disclose potential adverse impacts and identify mitigation measures specific to the actions identified in the Proposed Scoping Plan. The analysis generally found that the proposed Low Carbon Fuel Standard, Renewables Portfolio Standard and Water measures have the most potential to cause adverse environmental impacts due to the potential for land conversion when projects are undertaken. Additional environmental analysis will be needed when regulations are adopted and at the individual project level to identify mitigation for project specific impacts.

H. Administrative Burden

ARB conducted an assessment of the administrative burden of implementing the Proposed Scoping Plan recommendation. (HSC §38562 (b)(7)) The recommendation calls for ARB to develop a cap-and-trade program - a market-based regulatory program to cap and reduce emissions from the Industrial, Electricity, Natural Gas, and Transportation sectors. This program would require stringent monitoring and reporting on the part of the regulated community, and comprehensive enforcement on the part of ARB. Sources under the cap would need to analyze the best approach for their company to comply with a cap - assessing the cost of reducing emissions and comparing that to the cost of purchasing emission reductions in a market. Although ARB has not previously developed this type of market regulation, there is extensive experience to draw upon from within California, nationally, and internationally. In addition, the other regulatory components of the recommendation would require ARB and other State agencies to adopt a series of measures requiring regulatory development, outreach to stakeholders and the public, implementation by industry, and enforcement for numerous measures and programs.

I. De Minimis Emission Threshold

A minimum level at which regulations are determined not to apply is termed the 'de minimis threshold.' In recommending a de minimis level, ARB must take into account the relative contribution of each source or source category to statewide greenhouse gas emissions and the adverse effect on small business. (HSC §38561(e)) This threshold acts as a buffer below which the burden of regulation is determined to outweigh the potential harmful effect of the minimal level of emissions. However, it should not be assumed that an individual source of greenhouse gas emissions that is minimal if taken by itself will fall below the threshold. ARB often looks at the aggregate emissions from a source category or related source category when determining regulatory applicability.

A source category may be evaluated as the aggregate of businesses doing the same type of work (e.g., semiconductor manufacturers), a type of equipment (cargo handling equipment,

cars), a process or product (cans of pressurized duster), or other aggregated sources of emissions. Emissions of greenhouse gases from any individual entity within these source categories by themselves could be small. However, when emissions from the source category are evaluated, the relative contribution to climate change can be significant.

As ARB developed the Proposed Scoping Plan, potential measures were evaluated against criteria that included the relative contribution of the source to climate change. After this review and considering the level of emissions needed to meet the 1990 target established by AB 32, ARB recommends a de minimis level 0.1 MMTCO₂e annual emissions per source category.⁷³ Source categories whose total aggregated emissions are below this level are not proposed for emission reduction requirements in the Proposed Scoping Plan but may contribute toward the target via other means.

ARB and other agencies implementing measures included in the Scoping Plan should carefully consider this de minimis level in developing regulations, and only regulate smaller source categories if there is a compelling necessity.

As each regulation to implement the Scoping Plan is developed, ARB and other agencies will consider more specific de minimis levels below which the regulatory requirements would not apply. These levels will consider the cost to comply, especially for small businesses, and other factors.

⁷³ The Forest sector was not included in determining the de minimis level because this sector serves both as a source and a sink for carbon, making the concept of a de minimis level less applicable.

IV. IMPLEMENTATION: Putting the Plan into Action

Adoption of this Scoping Plan will be a groundbreaking step forward for California. However it is only the beginning of a journey that will last for decades, gradually moving the State into a low-carbon, clean energy future. Putting the Scoping Plan into action will be challenging but with adequate commitment and leadership from Californians up and down the state, it will be a success.

A. Personal Action

The greenhouse gas emission reductions required under AB 32 cannot be realized without the active participation of the people of California. While many of the measures in this Plan must be taken by large sources of emissions, such as power plants and industrial facilities, it is the voluntary commitment and involvement of millions of individuals and households throughout the State that will truly make this California's Plan.

Shifts in individual choices and attitudes drive changes in the economy and in institutions. This dynamic of changing individual behavior will influence California's effort to reduce greenhouse gas emissions. For example, as market forces and environmental awareness encourage more people to drive low-greenhouse gas emitting vehicles, the auto manufacturers will respond with more innovative models and more intensive research. Regulations requiring auto manufacturers to provide these cars will complement the market demand.

This means that thinking about climate change and our carbon footprint will naturally become part of how individuals make decisions about travel, work, and recreation. Some families may choose to purchase a more efficient vehicle when it comes time to replace their current model. Households may choose to lower their thermostat to 68 degrees Fahrenheit during the colder months, and raise it to 78 degrees when air conditioning is required. Some households may choose to swap out incandescent light bulbs for more efficient compact fluorescent lights. Others may choose to install solar water heaters, or arrays of solar electric panels on their roofs to take advantage of renewable energy, and lower their household energy bills. Many households may choose to plant trees to shade and cool their homes, and use landscaping and plants that require less water.

This Proposed Plan recommends measures that will help support many of these individual decisions to improve energy efficiency. Statewide measures and regional efforts will result in programs to promote public transportation or riding in carpools, subsidize the purchase of energy efficient appliances, or provide incentives to better insulate and weatherize older homes. ARB is fully committed to assuring California consumers have the widest possible choice of vehicles that emit fewer greenhouse gases than today's models, including the most advanced technology vehicles produced anywhere in the world.

Californians have embraced statewide programs that support positive change in home and business behavior. In less than two decades, separating household waste and recycling at home and work have become commonplace, as has the widespread purchase of appliances with the Energy Star label to save energy. Reducing our carbon footprint by moving toward a cleaner more efficient economy will produce a **wide** range of benefits to individuals, through lower energy bills and a healthier environment for all.

Conservation can also play a key role. By employing practices to use our resources more sparingly, consumers can both save money and reduce greenhouse gas emissions. On August 18, 2008, Governor Arnold Schwarzenegger launched the EcoDriving program - a comprehensive effort to save consumers money at the gas pump, reduce fuel use and cut CO₂ emissions. By following a set of easy-to-use best practices for driving and vehicle maintenance, a typical EcoDriver can improve mileage by approximately 15 percent. Furthermore, safety is improved when driving speeds are reduced, a key EcoDriving strategy.

Similarly, consumers and businesses can save money and reduce greenhouse gas emissions by conserving resources at homes, offices and commercial buildings. For example, wireless monitor devices to provide instantaneous energy-usage information inside the home are being developed to show users how many kilowatt hours they're consuming at any given moment - as well as how much it's costing them.⁷⁴ Providing real-time information on appliance energy use can greatly assist consumers in conserving electricity use.

Many Californians concerned about climate change have also begun to buy carbon offsets to mitigate the impact of their daily activities. These can take various forms, including options that allow consumers to add 'carbon credits' when buying airline tickets, or paying a small monthly charge on utility bills to buy green power. ARB will be working to establish clear rules for voluntary reductions and offsets that might be used for compliance with AB 32. These rules will also help establish clear guidelines for these types of voluntary carbon credit programs and provide California's businesses and consumers greater assurance that money spent on these programs result in real reductions in greenhouse gas emissions.

For more information about how to reduce one's personal carbon footprint, visit www.coolcalifornia.org. This web site provides a carbon footprint calculator and a "top ten" list of ways to save energy at home.

B. Public Outreach and Education

To be successful, a climate action program needs an effective public outreach and education program. The Proposed Plan calls for a robust statewide program designed to generate awareness and involvement in California's climate change efforts.

⁷⁴ The Sacramento Municipal Utility District (SMUD) is subsidizing PowerCost Monitors to 5,000 customers as a part of a demonstration program. [www.smud.org/residential/saving-energy/monitor.html]

The Climate Action Team will convene a steering team that includes State agencies and other public agencies such as the state's air districts, and public and private utilities, which have a strong track record of successful efforts at public education to reduce driving (Spare the Air) or promote energy efficiency and reduce energy demand. With the release of the California Energy Efficiency Strategic Plan, the CPUC has committed to the launch of a new brand for California Energy Efficiency in 2009, focused on energy efficiency opportunities and coordinated with climate change messaging under AB 32. The steering committee will develop a coordinated array of messages and draw upon a wide range of messengers to deliver them. These will include regional and local governments-whose individual outreach campaigns can reinforce the broader State outreach themes while also delivering more targeted messages directly tied to specific local and regional programs.

To ensure that all Californians are included in efforts to address climate change, California will also support highly localized efforts at public education and outreach at the community and neighborhood level. This includes service club organizations and existing faith-based communities - churches, mosques and synagogues. Other private-sector entities including businesses and local chambers of commerce will be invited to partner in spreading the word.

1. Involving the Public and Stakeholders in Measure Development

In keeping with the requirements of AB 32 and the legacy of four decades of regulatory development at ARB, we have worked to make this process fully transparent and will continue to do so as regulations to implement the plan are developed. We will continue our efforts to involve the public to the greatest extent feasible at every stage of the process, including informal and formal rulemaking activities. This will include disadvantaged communities and those with localized concerns, as well as affected industries and small businesses.

Local and community meetings and outreach have been and will continue to be a central element of all rulemaking, with State agencies working closely with disadvantaged communities, EJAC, public health experts, and other stakeholders to fully evaluate the impacts associated with California's greenhouse gas emissions reduction strategies. State agencies involved in measure development will continue to meet periodically with communities to assess any challenges to implementation, or to discover possible new measures or approaches. Stakeholders will be invited to participate in the many additional workshops, workgroups and seminars that will be held as individual measures are developed.

2. Education and Workforce Development

The transition to a clean energy future presents California with a tremendous opportunity to continue growing its green economy and to expand the growth of green job opportunities throughout the state. Making this transition will require a technically educated workforce that is equipped with the skills to develop and deploy 21st century technologies. Investments in training, career technical education, worker

transition assistance, and collaboration between public and private partners will be key to ensuring that California fully reaps the economic and job opportunities that will accompany implementation of AB 32.

Setting California on track to a low-carbon future beyond 2020 will be a multi-generational challenge. To meet this challenge, climate-related education in schools must be a central element of California's plan. By 2010, California will develop climate change education components to the State's new K-12 model school curriculum as part of the Education and the Environment Initiative (AB 1548, Pavley, Chapter 665, Statutes of 2003). Expanding the knowledge and opportunities of young people to participate in promoting their own and their communities' environmental health will be an important theme for all these efforts. In the meantime, ARB's educational outreach will continue through the Cool California web pages (www.coolcalifornia.org) and the continued support of student educators through the California Climate Champions programs. ARB will also rely on partners throughout the state to develop and display options for curricula that will enhance the K-12, community college, trade technical training programs, and programs at four-year colleges.

The demand for workers to fill green jobs is rising. There are currently more than 3,000 green businesses in the state, accounting for about 44,000 jobs: 36 percent of these jobs are in professional, scientific, and technical services; 19 percent are in construction; and 15 percent are in manufacturing.⁷⁵ Some of these jobs are in new fields, yet many others are simply augmentations of existing skills and vocations such as electrical, construction, machining, auto tech, and heating ventilation and air conditioning. As we move toward 2020, tens of thousands of new green job opportunities will be created.⁷⁶ Whether these opportunities come in entirely new fields of employment or in existing areas, it will be critical for California to have a trained workforce available.

Ensuring that California can continue to meet the demand for green jobs will require close coordination between workforce development agencies, businesses, State and local governments, labor unions, and community colleges and universities. Many organizations are already developing strategies and identifying steps to simultaneously meet industry workforce needs and help build a more sustainable economy. For instance, the California Labor and Workforce Development Agency (LWDA) provides a comprehensive range of employment and training services in partnership with State and local agencies and organizations. Similar additional efforts will be crucial in ensuring that the transition to a green economy benefits working families in California by providing a steady supply of livable-wage jobs. In the area

⁷⁵ DoC. Berkeley Labor Center. *California's Global Warming Solutions Act of 2006, A Background Paper for Labor Unions*. August 2008. p07 http://laborcenter.berkeley.edu/greenjobs/AB32_background_paper080pdf (accessed October 12, 2008)

⁷⁶ California Economic Strategy Panel. *Clean Technology and the Green Economy; Growing Products, Services, Businesses and Jobs in California's Value Network*, Draft, March 2008. http://www.laborocaogov/panel/pdfIDRAff_Green_Economy.031708.pdf

of energy efficiency, the California Long Term Energy Efficiency Strategic Plan, adopted by the CPUC, details a vision and supporting strategies for the development of a workforce trained and engaged to achieve California's energy-efficiency objectives.

The following strategies will be key to ensure that California's workforce is equipped to help lead the transition to a clean energy future:

- Strengthen and expand access to Career and Technical Education (CTE) in California public schools for the next generation of workers who will build a green economy. Over the past several decades, there has been a steady decline in career and technical education. In 2007, less than one-third of all high school students in the state were enrolled in some form of CTE.⁷⁷ To take full advantage of the emerging green economy and meet the goals of AB 32, California needs to expand opportunities for CTE in schools. This could include pursuing strategies such as requiring CTE coursework for all middle- and high-school students; increasing the number of CTE credentialed teachers; expanding investment in facilities and equipment for career and technical education; and aligning educational curricula more closely with the skill and workforce needs of the emerging green economy.
- Ensure an adequate pipeline of skilled workers who are trained in the new technologies of a greener economy. While some green jobs will be in new businesses and new occupations, most green jobs are variations of traditional occupations in sectors like construction, utilities, manufacturing and transportation.⁷⁸ In light of the fact that forty percent of the nation's skilled workers are slated to retire in the next 5 to 10 years,⁷⁹ there is an urgent need for educational and training programs to fill these jobs. Strategies to create a steady pipeline of skilled workers include expanding curriculum choices in schools, colleges, and universities to fully reflect career opportunities available in an economy increasingly centered on clean technologies. Other strategies include offering a greater array of industry- and technology-specific courses that would link directly with postsecondary training such as apprenticeship programs, vocational training, or college.
- Ensure that California's higher education institutions continue to produce the next generation of clean tech engineers, scientists and business leaders. In addition to providing valuable research on potential climate-change mitigation and adaptation strategies, California's world-class research institutions are the incubators for many of the clean tech companies that will contribute to

⁷⁷ Get REAL. *Aligning California's Public Education System with the 21st Century Economy Policy Paper for Discussion at Governor Arnold Schwarzenegger's Summit on Career and Technical Education*, March 6, 2007

⁷⁸ Ibid.

⁷⁹ The New Apollo Program, *Clean Energy, Good Jobs: A National Economic Strategy for the New American Century*, July 2008. p.20 <http://apolloalliance.org/downloads/fullreportfinal.pdf> (accessed October 12, 2008)

California's environmental and economic future. It will be critical for California to continue to cultivate university research and training programs in a way that takes full advantage of this valuable state resource.

A successful transition to a clean energy future depends heavily on California's ability to provide a well-trained workforce to meet the demands of the growing green economy. ARB and our key partners will continue working throughout the state to ensure that an adequate supply of skilled workers is positioned to take advantage of the growing opportunities for high quality jobs and careers that implementation of AB 32 will bring.

3. Small Businesses

Small businesses play a crucial role in California's economy. As noted in Chapter III, our analysis indicates that this plan will have a net positive impact on small businesses. These impacts are attributable primarily to the measures in the plan that will deliver significantly greater energy and fuel efficiencies. However, as also noted in the analysis, ensuring that these benefits are realized to the fullest potential will require additional outreach and communication efforts by ARB and many other state and local entities.

One of ARB's Early Action measures is designed to help businesses during AB 32 implementation. With our State partners, we are developing an on-line small business "toolkit" designed for small and medium-sized businesses that will provide a one-stop shop for technical and financial resources. Toolkit components will include a business-specific calculator to assess a company's carbon footprint; a voluntary greenhouse gas inventory protocol for measuring greenhouse gas emissions; recommended best practices for energy, transportation, building, purchasing, and recycling; case studies demonstrating how small and medium California businesses have reduced greenhouse gas emissions; program financing resources; peer-networking opportunities; and an awards program to recognize reductions of greenhouse gas emissions among California businesses.

ARB will also continue working with the many business associations, organizations, and other State partners, such as the Small Business Advocate's AB 32 Small Business Task Force, the Labor and Workforce Development Agency, and Business, Transportation, and Housing Agency that have the resources, input and expertise to provide. These partners will help to further develop and implement an effective outreach plan to provide technical assistance to businesses through a variety of means, including attendance at business events, workshops, and working with local economic development agencies.

C. Implementation of the Plan

This Proposed Scoping Plan outlines the regulations and other mechanisms needed to reduce greenhouse gas emissions in California. ARB and other State agencies will work closely with stakeholders and the public to develop regulatory measures and other programs to

implement the Plan. ARB and other State agencies will develop any regulations in accordance with established rulemaking guidelines. Table 32 shows the status of the proposed measures in the plan.

Table 32: Status of Proposed Scoping Plan Measures

Existing Laws, Regulations, Policies And Programs
Light-Duty Vehicle Greenhouse Gas Standards (Pavley I)
Renewables Portfolio Standard (to 20%)
Solar Hot Water Heaters
Million Solar Roofs
High Speed Rail
Measures Strengthening & Expanding Existing Policies & Programs
Electricity Efficiency
Natural Gas Efficiency
Renewables Portfolio Standard (from 20% to 33%)
Sustainable Forests
Light-Duty Vehicle Greenhouse Gas Standards (Pavley II)
Discrete Early Actions
Low Carbon Fuel Standard
High GWP in Consumer Products (Adopted)
Smartways
Landfill Methane Capture
High GWP in Semiconductor Manufacturing
Ship Electrification (Adopted)
SF6 in non-electrical applications
Mobile Air Conditioner Repair Cans
Tire Pressure Program
New Measures
California Cap-and-Trade Program Linked to WCI Partner Jurisdictions
Increase Combined Heat and Power
Regional Transportation-Related GHG Targets
Goods Movement Systemwide Efficiency
Vehicle Efficiency Measures
Medium/Heavy Duty Vehicle Hybridization
High GWP Reductions from Mobile Sources
High GWP Reductions from Stationary Sources
Mitigation Fee on High GWP Gases
Oil and Gas Extraction
Oil and Gas Transmission
Refinery Flares
Removal of Methane Exemption from Existing Refinery Regulations

Rulemakings will take place over the next two years. As with all rulemaking processes, there will be ample opportunity for both informal interaction with technical staff in meetings and workshops, and formal interaction. ARB will consider all information and stakeholder input during the rulemaking process. Based on this information, ARB may modify proposed measures to reflect the status of technological development, the cost of the measure, the cost-effectiveness of the measures and other factors before presenting them to the Board for consideration and adoption.

In addition to these existing approaches, AB 32 imposes other requirements for the rulemaking process. Section 38562(b) explicitly added requirements for any regulations adopted for greenhouse gas emissions reductions. ARB also recognizes the need to expand the scope of analysis required when adopting future greenhouse gas emission reduction regulations. These expanded evaluations include the unique enforcement nature of climate change-related regulations and the possible extended permitting considerations and timelines that must be taken into account when establishing compliance dates. An important consideration in developing regulations will be the potential impact on California businesses. The potential for leakage, the movement of greenhouse gas emissions (and economic activity) out of state, will be carefully evaluated during the regulatory development.

As noted above, as the Scoping Plan is implemented and specific measures are developed, ARB and other implementing agencies will also conduct further CEQA analyses, including cumulative and multi-media impacts. ARB must design equitable regulations that encourage early action, do not disproportionately impact low-income and minority communities, ensure that AB 32 programs complement and do not interfere with the attainment and maintenance of ambient air quality standards, consider overall societal benefits (such as diversification of energy resources), minimize the administrative burden, and minimize the potential for leakage. AB 32 requires that, to the extent feasible and in furtherance of achieving the statewide greenhouse gas emission limit, ARB must consider the potential for direct, indirect and cumulative emission impacts from market-based compliance mechanisms, including localized impacts in communities that are already adversely impacted by air pollution, design the program to prevent any increase in emissions, and maximize additional environmental and economic benefits prior to the inclusion of market-based compliance mechanisms in the regulations. As ARB further develops its approach for consideration of these issues in future rulemakings, and updates needed analytical tools and data sets, we will consult with outside experts and the EJAC.

ARB already conducts robust environmental and environmental justice assessments of our regulatory actions. Many of the requirements in AB 32 overlap with ARB's traditional evaluations. In adopting regulations to implement the measures recommended in the Scoping Plan, or including in the regulations the use of market-based compliance mechanisms to comply with the regulations, ARB will ensure that the measures have undergone the aforementioned screenings and meet the requirements established in HSC §38562 (b) (1-9) and §38570 (b) (1-3).

D. Tracking and Measuring Progress

Many State agencies, working with the diverse set of greenhouse gas emissions sources, have collaborated in the process of developing the strategies presented in this plan. As the agency responsible for ensuring that AB 32 requirements are met, ARB must track the regulations adopted and other actions taken by both ARB and other State agencies as the plan is implemented.

The emissions reductions enumerated in this plan are estimates that may be modified based on additional information. As the proposed measures are developed over the coming years, it is possible that some of these strategies will not develop as originally thought or not be technologically feasible or cost-effective at the level given in the plan. It is equally likely that new technologies and strategies will emerge after the initial adoption schedule required in AB 32, that is, regulation adoption by January 1, 2011. If promising new tools or strategies emerge, ARB and other affected State agencies will evaluate how to incorporate the new measures into the AB 32 program. In this way, new strategies ensuring that the commitments in the plan remain whole and that the 2020 goal can be met will be incorporated into the State strategy.

ARB will update the plan at least once every five years (HSC §38561(h)). These updates will allow ARB to evaluate the progress made toward the State's greenhouse gas emission reduction goals and correct the Plan's course where necessary. This section discusses the tracking and measurement of progress that ARB envisions. The Report Cards and audits, along with an evaluation of new technologies - both emerging and those recently incorporated into the Plan - will also provide valuable input into ARB's update process. Continuous atmospheric monitoring of greenhouse gases may also be useful for determining the effectiveness of emission reduction strategies and for future inventory development.

1. Report Card

SB 85 (Budget Committee, Chapter 178, Statutes of 2007) requires every State agency to prepare an annual "Report Card," detailing measures the agency has adopted and taken to reduce greenhouse gas emissions, including the actual emissions reduced as a result of those actions. The information must be submitted to CalEPA, which is then required to compile all the State agency data into a report format, which is made available on the Internet and submitted to the Legislature. The information allows comparisons of each agency's projected and actual greenhouse gas emissions reductions with the targets established by the CAT or the Scoping Plan. This would be the State's 'Report Card' on its efforts to reduce greenhouse gas emissions.

Agencies are also required, as funds are available, to have an outside audit of greenhouse gas-related actions completed every three years to verify actual and projected reductions.

2. Tracking Progress by Implementing Agencies

As the lead agency responsible for implementing AB 32, ARB must track the progress of both our efforts and the efforts of our partners in implementing their respective provisions of this plan. Communication between ARB and the other implementing agencies will be especially important as regulations and programs are developed. In support of the Report Card requirement noted above, ARB will work with CalEPA to develop a process to track and report on progress toward the plan's goals and commitments.

3. Progress Toward the State Government Target

The CAT recently established a State Government Subgroup to work with State agencies to create a statewide approach to meet the Scoping Plan's commitment to reduce greenhouse gas emissions by a minimum of 30 percent by 2020 below the State's estimated business-as-usual emissions - approximately a 15 percent reduction from current levels. State agencies must lead by example by doing their part to reduce emissions and employ practices that can also be transferred to the private sector. The statewide plan will serve as a guide for State agencies to achieve realistic, measurable objectives within specific timelines. This newly created State Government Subgroup will assist State agencies through these steps in a timely manner.

4. Mandatory Reporting Regulation

ARB's mandatory reporting rule, adopted in December 2007, will help the State obtain facility-level data from the largest sources of greenhouse gas emissions in California. This data will help ARB better understand these sources to develop the proposed emissions reduction measures outlined in this plan.

The regulation requires annual reporting from the largest facilities in the state, accounting for 94 percent of greenhouse gas emissions from industrial and commercial stationary sources in California. There are approximately 800 separate sources that fall under the new reporting rules, which include electricity generating facilities, electricity retail providers and power marketers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and industrial sources that emit over 25,000 tons of carbon dioxide each year from on-site stationary source combustions such as large furnaces. This last category includes a diverse range of facilities such as food processing, glass container manufacturers, oil and gas production, and mineral processing.

Affected facilities will begin tracking their greenhouse gas emissions in 2008, to be reported beginning in 2009 with a phase-in process to allow facilities to develop reporting systems and train personnel in data collection. Emissions for 2008 may be based on best available data. Beginning in 2010, emissions reports will be more rigorous and will be subject to third-party verification. Reported emissions data will allow ARB to improve its facility-based emissions inventory data. Originally, the statewide greenhouse gas inventory was based on aggregated sector data and could

not be broken down to the facility level. The facility-level reporting required under the Mandatory Reporting regulation will improve data on greenhouse gas emissions for individual facilities and their emitting processes. This information could also help improve emissions inventories for criteria pollutants, and provide additional data for assessing cumulative emission impacts on a community level.

ARB emissions reporting requirements are expected to be modified over time as AB 32 is implemented.

E. Enforcement

Enforcement is a critical component of all of the State's regulatory programs, both to ensure that emissions are actually reduced and to provide a level playing field for entities complying with the law. To meet the 2020 target this plan calls for aggressive action by a number of State agencies. Each of those agencies will employ its full range of compliance and enforcement options to ensure that planned reductions are achieved. The remainder of this section discusses ARB's portion of the enforcement program in more detail.

ARB has an extensive and effective enforcement program covering a wide variety of regulated sources, from heavy-duty vehicle idling, to consumer products, to fuel standards and off-road equipment. To increase the effectiveness of its enforcement efforts and provide greater assurance of compliance, ARB also partners with local, State and federal agencies to carry out inspections and, when necessary, prosecute violators.

ARB will continue its strong enforcement presence as the State's primary air pollution control agency. A critical function of this responsibility is to ensure that all enforcement actions are timely, effective, and appropriate with the severity of the situation. ARB will also continue its close working relationship with local air districts in the development and enforcement of applicable regulations contained within the Scoping Plan and collaborate with the appropriate State agencies on greenhouse gas emission reductions measures.

For the stationary source regulations called for in the plan, ARB will work closely with the local air districts that have primary responsibility for implementing and enforcing criteria pollutant regulations. Not only are local air districts familiar with the individual facilities and their compliance history, but information contained in district permits can be used to verify the accuracy of greenhouse gas emissions reported by sources subject to ARB mandatory reporting requirements. Using this data, regulators can also examine any correlation between greenhouse gases and toxic or criteria air pollutants as a result of emissions trading or direct regulations.

ARB will also continue to partner with the California Highway Patrol and other State and local enforcement agencies on mobile source and other laws and regulations where joint enforcement authorities apply.

Although many of the measures in the Proposed Scoping Plan are modeled on existing ARB regulations, a multi-sector, regional cap-and-trade program would bring unique enforcement challenges. ARB and CalEPA have begun the process of engaging and consulting with other State agencies, such as California's Department of Justice, Public Utilities Commission, Energy Commission, as well as the Independent System Operator, on market tracking and enforcement. These working group meetings are ongoing and will culminate in a comprehensive enforcement plan to accompany the proposed cap-and-trade program when the Board considers regulatory requirements. This enforcement plan would describe the administrative structures needed for market monitoring, prosecution, and penalty setting. Public input regarding these issues would also be a key part of the public stakeholder process conducted during development of the cap-and-trade programs regulations.

Accurate measurement and reporting of all emissions would be necessary to assure accountability, establish the integrity of allowances, and provide sufficient transparency to sustain confidence in the market. To ensure compliance, ARB would administer penalties for entities that hold an insufficient quantity of allowances to cover their emissions or fail to report their greenhouse gas emissions. Missed compliance deadlines would also result in the application of stringent administrative, civil, or criminal penalties.

This plan recommends that California implement a cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system. This system would require California to formalize enforcement agreements with its WCI partner jurisdictions for all phases of cap-and-trade program operations, including verification of emissions, certification of offsets based on common protocols, and detection of and punishment for non-compliance. As needed, California would also work with federal regulatory and enforcement agencies that oversee trading markets, such as the Commodity Futures Trading Commission and the Federal Energy Regulatory Commission. While California would work with other jurisdictions on joint enforcement activities, ARB will exercise all of its authority under HSC §38580 and other provisions of law to enforce its regulations against any violator wherever they may be.

F. State and Local Permitting Considerations

Some of the proposed emissions reduction strategies in this Proposed Scoping Plan may require affected entities to modify or obtain state or local permits. California's existing permit process ensures that health and safety concerns are evaluated, met, and when appropriate, mitigated. The State recognizes the potential for conflicts between various federal, state and local permitting requirements, which may cross various media - air, water, etc. CalEPA is actively involved in identifying and addressing these regulatory overlap issues with the ultimate goal of consolidating permits where feasible while maintaining all permit requirements. Two such examples are CalEPA's digester permit working group and the CalEPA-Air District Compost Emissions Work Group.

ARB recognizes that the permitting process may affect the viability of certain strategies and that the length of the permitting process could affect the timing of emissions reductions.

ARB, along with CalEPA and other State agencies, will continue to evaluate steps to ensure that permit requirements harmonize across the affected media.

This Plan has been developed with an understanding of the important cross-media impacts. These efforts will continue during the implementation of the Plan. Particular focus on the potential permitting impacts and cross-media consequences of a proposed rule will take place during the rulemaking process.

G. Role of Local Air Districts

Local air districts are ARB's partners in addressing air pollution. ARB takes primary responsibility for transportation, off-road equipment and consumer products. Local districts lead in controlling industrial, commercial and other stationary sources of air emissions. AB 32 recognizes the need to develop a program that meshes with local and regional activities. Although AB 32 does not provide an explicit role for air districts, their local presence as advocates for clean air and their resources, experience and expertise in regulating and enforcing rules for stationary sources make them a logical choice to have an important role in several aspects of implementing California's greenhouse gas program. ARB would partner with local air districts to develop and effectively enforce both source-specific requirements on industrial sources, and to enforce related programs, such as the high GWP rules, that affect a large number of local businesses.

ARB and local air districts are also actively working to coordinate emission reporting requirements. Some districts, like the South Coast Air Quality Management District, have developed software to allow their industrial sources to simultaneously report their criteria pollutant emissions to the District and their greenhouse gas emissions to ARB. Many air district staff are being trained as third-party verifiers to confirm the greenhouse gas emissions information provided by industrial sources under the mandatory reporting regulation, and, similarly, could provide verification of voluntary greenhouse gas reductions in the future.

Local air districts will be key in both encouraging greenhouse gas emissions reductions from other regional and local government entities, and providing technical assistance to quantify and verify those reductions. Local agencies are an important component of ARB's outreach strategy.

Many local air districts have already taken a leadership role in addressing greenhouse gas emissions in their communities. These efforts are intended to encourage early voluntary reductions. For example, local districts are "lead agencies" under the California Environmental Quality Act (CEQA) for some projects. In order to ensure high-quality mitigation projects, some districts have established programs to encourage local greenhouse gas reductions that could be used as CEQA mitigation. As the State begins to institutionalize mechanisms to generate and verify greenhouse gas emissions reductions, ARB and the districts must work together to smoothly transition to a cohesive statewide program with consistent technical standards.

H. Program Funding

Administration, implementation, and enforcement of the emissions reduction measures contained in the Proposed Scoping Plan will require a stable and continuing source of funding. AB 32 authorizes ARB to collect fees to fund implementation of the statute. This fall ARB will initiate a rulemaking for a fee program to fund administration of the program.

Approximately \$55 million per year will be needed on an ongoing basis to fund implementation by ARB and other State agencies, based on the positions and funding included in the 2008-2009 fiscal year budget. Additional revenues are needed to repay the loans from State funds that were used to pay ARB and CalEPA expenses in the startup of the program. ARB is moving on an expedited schedule to develop a fee regulation and expects to take a regulation to the Board in early 2009, with the aim of beginning to collect fees in the 2009-2010 fiscal year.

V. A VISION FOR THE FUTURE

California has the know-how, ingenuity, research capabilities, and culture of innovation to meet the challenge of addressing climate change. However, reaching the goals we have set for ourselves will not be easy. Successful implementation of many of the proposed programs and measures described in this plan will require strong leadership and a shared understanding of the need to reach viable and lasting solutions quickly.

This challenge will also require establishing a wide range of partnerships, both within California and beyond our borders. We will need to support additional research, and further develop our culture of innovation and technological invention. In order to continue the momentum and the commitment to a clean energy future, we will need to both build on existing solutions and develop new ones.

The following sections layout some of the elements that will be necessary to forge a broad-based institutional strategy to address climate change both within California and beyond. Also discussed is the need to build partnerships on the regional, national and international levels to ensure that our actions complement and support those being taken on a global scale. This section also looks forward to 2030, showing that California is on the trajectory needed to do our part to stabilize global climate.

A. Collaboration

1. Working Closely with Key Partners

True climate change mitigation will require many parties to work together for a global mitigation plan. California and other states are filling a vacuum created by the current lack of leadership at the federal level. By its bold actions, California is moving the United States closer to a seat at the table among the developed countries that have agreed to reduce their carbon emissions, and lead a new international effort for an agreement to replace the Kyoto Protocol that expires in 2012.

Any national climate program must be built on a partnership with State and local governments to ensure that states can continue their role as incubators of climate change policy and can implement effective programs such as vehicle standards, energy efficiency programs, green building codes, and alternative fuel development.

California will work for climate solutions with key federal agencies, including the U.S. Department of Energy and their national labs, the U.S. Environmental Protection Agency, the U.S. Bureau of Land Management, the U.S. Department of Agriculture, the U.S. Department of Transportation, and others.

Through the Western Climate Initiative and in collaboration with other regional alliances of states, California can promote its own best practices and learn from others while helping to formulate the structure of a regional and ultimately national cap-and-trade program.

2. International

As one of the largest economies in the world, California is committed to working at the international level to reduce global greenhouse gas emissions. As part of this effort, Governor Schwarzenegger and other U.S. governors taking the lead in climate change are co-hosting a Global Climate Summit on Finding Solutions Through Regional and Global Action. This summit, to be held on November 18th and 19th, 2008, will begin a state-province partnership with leaders from the U.S., Australia, Brazil, Canada, China, India, Indonesia, Mexico, the European Union, and other nations, to take urgent steps to contain global climate change and jointly set forth a blueprint for the next global agreement on climate change solutions.

California is also a charter member of the International Carbon Action Partnership (ICAP), an organization composed of countries and regions that have adopted carbon caps and that are actively pursuing the implementation of carbon markets through mandatory cap-and-trade systems. California's continued involvement in ICAP will be very beneficial for sharing experiences and knowledge as we design our own market program.

In addition to participating in ICAP, California hopes to engage developing countries to pursue a low-carbon development path. With developing nations expected to suffer the most from the effects of climate change, California and others have an obligation to share information and resources on cost-effective technologies and approaches for mitigating both emissions and future impacts as changes in climate and the environment occur.

California recognizes the "common but differentiated responsibilities" among developed and developing countries (as articulated in the Kyoto Protocol), but the reality is that rapidly escalating greenhouse gas emissions in developing countries could possibly negate any efforts undertaken in California. To the extent that we are part of the global economy, California's demand for goods manufactured in developing countries further exacerbates growth of greenhouse gas emissions globally. Therefore, it is critical for California to help support the adoption of low-carbon technologies and sustainable development in the developing world.

California can advance the international policy debate through state-provincial partnerships for achieving early climate action in developing countries. This approach envisions commitments by developed countries to provide capacity building through technological assistance and investment support in return for developing countries adopting enhanced mitigation actions. California will consider working with developing countries or provinces that have, at a minimum, pledged to achieve greenhouse gas intensity targets in certain carbon-intensive sectors through

mechanisms, such as minimum performance standards or sector benchmarks. California also recognizes that developing countries have the challenge and responsibility to reduce domestic emissions in a way that will promote sustainable development, but not undermine their economic growth.

One possible manifestation of these collaborations could be the establishment of sectoral agreements that help to grow developing countries' economies in a low-carbon manner. In a sectoral approach, energy-intensive sectors adopt programs for reducing greenhouse gas emissions and/or energy use. Such sector-based approaches seem likely to win the support of developing countries and could also reduce concerns in developed countries about international competitiveness and carbon leakage.

A state-provincial partnership related to imported commodities (such as cement) would enable California to provide incentives to reduce greenhouse gas emissions associated with products that are imported by our state. California should continue to develop current relations and existing partnership arrangements with China - now the largest emitter of greenhouse gases in the world - because in addition to other compelling reasons much of the state's imported cement originates in China. California should also work to establish similar relations with India and other countries to share research on both greenhouse gas mitigation and climate change adaptation activities. Projects in the Mexican border region may also be of particular interest, considering the opportunity to realize considerable co-benefits on both sides of the border.

Deforestation accounts for approximately 20 percent of global greenhouse gas emissions. California has set a strong precedent in the effort to incorporate forest management and conservation into climate policy by adopting the CCAR forest methodology in October 2007. California also hopes to engage developing countries, including Brazil and Indonesia, to reduce emissions and sequester carbon through eligible forest carbon activities. Activities aimed at Reducing Emissions from Deforestation and Forest Degradation (REDD) were excluded from the rules governing the first Kyoto-commitment period, but there is considerable momentum behind the effort to include provisions that would recognize such activities in a post-2012 international agreement. Providing incentives to developing countries to help cut emissions by preserving standing forests, and to sequester additional carbon through the restoration and reforestation of degraded lands and forests and improved forest management practices, will be crucial in bringing those countries into the global climate protection effort. California recognizes the importance of establishing mechanisms that will facilitate global partnerships and sustainable financing mechanisms to support eligible forest carbon activities in the developing world.

B. Research

1. Unleash the Potential of California's Universities and Private Sector

Bringing greenhouse gas emissions down to a level that will allow the climate to stabilize will take a generation or longer. Many of the ultimate solutions to achieve stabilization will be developed and implemented well into the future. Innovation in energy and climate will come from people who are now in school. These young people will face unprecedented challenges, and they will need both wisdom and imagination to craft solutions. California's respected public and private academic institutions must continue to develop and fund programs based on climate change science that cut across disciplines to address the multi-dimensional aspects of climate change.

2. Public-Private Partnerships

To most effectively address the climate change dilemma, we must encourage collaborations between academia and the private sector. Industry is well-positioned to quickly attack problems. Combining the vast knowledge housed in universities with businesses' acumen and agility can unleash a powerful collaborative force to tackle the problems associated with climate change.

Several important programs have already been initiated at California universities, including Stanford's Global Climate and Energy Project and the University of California at Berkeley's Energy Biosciences Institute (EBI).⁸⁰ These and other efforts need to be recognized and encouraged, along with others that can link the results of research directly to policy decisions that the State must make.

Carbon Sequestration

In addition to terrestrial carbon sequestration or natural carbon sinks such as forests and soil, CO₂ can be prevented from entering the atmosphere through carbon capture and storage (CCS). This consists of separating CO₂ from industrial and energy-related sources and transporting the CO₂ to a storage location for long-term isolation from the atmosphere. Potential technical storage methods include geological storage, industrial fixation of CO₂ into inorganic carbonates, and other strategies. Large point sources of CO₂ that may pursue CCS include large power plants, fossil fuel-based hydrogen production plants, and oil refineries.⁸¹

⁸⁰ The EBI is being developed in cooperation with Lawrence Berkeley National Laboratory, the University of Illinois at Urbana-Champaign and BP.

⁸¹ Intergovernmental Panel on Climate Change. *Carbon Dioxide Capture and Storage: A Special Report of Working Group III of the IPCC*. Cambridge University Press, UK; 2005.

<http://www.ipcc.ch/ipccreports/srccs.htm> (accessed October 12, 2008)

According to a 2005 report by the Intergovernmental Panel for Climate Change (IPCC), a power plant with CCS could reduce CO₂ emissions to the atmosphere by approximately 80 to 90 percent compared to a plant without CCS (including the energy used to capture, compress and transport CO₂).⁸² While more research and development needs to occur, California should both support near-term advancement of the technology and ensure that an adequate framework is in place to provide credit for CCS projects when appropriate.

The State is currently an active member of the West Coast-Regional Carbon Sequestration Partnership (WESTCARB), a public-private collaboration to characterize regional carbon sequestration opportunities in seven western states and one Canadian province. Established in 2003, this research project is comprised of more than 80 public and private organizations. WESTCARB is conducting technology validation field tests, identifying major sources of CO₂ in its territory, assessing the status and cost of technologies for separating CO₂ from process and exhaust gases, and determining the potential for storing captured CO₂ in secure geologic formations.⁸³

C. Reducing California's Emissions Further - A Look Forward to 2030

In order to assess whether implementing this plan achieves the State's long-term climate goals, we must look beyond 2020 to see whether the emissions reduction measures set California on the trajectory needed to do our part to stabilize global climate.

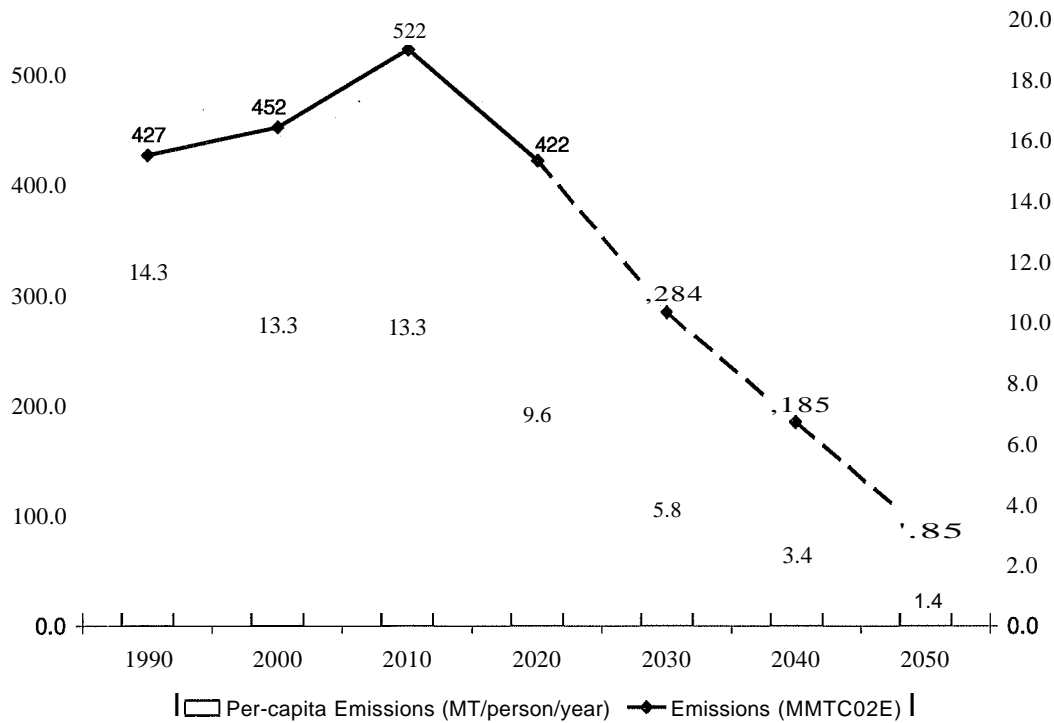
Governor Schwarzenegger's Executive Order S-3-05 calls for an 80 percent reduction below 1990 greenhouse gas emission levels by 2050. This results in a 2050 target of about 85 MMTCO₂E (total emissions), as compared to the 1990 level (also the 2020 target) of 427 MMTCO₂E. Climate scientists tell us that the 2050 target represents the level of greenhouse gas emissions that advanced economies must reach if the climate is to be stabilized in the latter half of the 21st century. Full implementation of the Proposed Scoping Plan will put California on a path toward these required long-term reductions. Just as importantly, it will put into place many of the measures needed to keep us on that path.

Figure 6 depicts what an emissions trajectory might look like, assuming California follows a linear path from the 2020 AB 32 emissions target to the 2050 goal needed to help stabilize climate. While the measures needed to meet the 2050 goal are too far in the future to define in detail, we can examine the policies needed to keep us on track through at least 2030.

⁸² Ibid

⁸³ WESTCARB. *WESTCARB Overview*. <http://www.westcarb.org/aboutoverview.htm> (accessed October 12, 2008)

Figure 6: Emissions Trajectory Toward 2050



To stay on course toward the 2050 target our State's greenhouse gas emissions need to be reduced to below 300 MMTC02E by 2030. This translates to an average reduction of four percent per year between 2020 and 2030. An additional challenge comes from the fact that California's population is expected to grow by about 12 percent between 2020 and 2030. To counteract this trend, per-capita emissions must decrease at an average rate of slightly less than five percent per year during the 2020 to 2030 period.

Are such reductions possible by 2030? What measures might be able to provide the needed reductions? How do the needed measures relate to the efforts put into place to reach the 2020 goal? All of these are critical questions, and are addressed below.

The answer to the first question is yes, the reductions are possible. Furthermore, the measures needed are logical expansions of the programs recommended in the Proposed Scoping Plan that get us to the 2020 goal. We could keep on track through 2030 by extending those programs in the following ways:

- Using a regional or national cap-and-trade system to further limit emissions from the 85 percent of greenhouse gas emissions in capped sectors (Transportation Fuels and other fuel use, Electricity; Residential/Commercial Natural Gas, and Industry). By 2030 a comprehensive cap-and-trade program could lower emissions in the capped sectors from 365 MMTC02E in 2020 to around 250 MMTC02E in 2030;

- Achieving a 40 percent fleet-wide passenger vehicle reduction by 2030, approximately double the almost 20 percent expected in 2020;
- Increasing California's use of renewable energy;
- Reducing the carbon intensity of transportation fuels by 25 percent (a further decrease from the 10 percent level set for 2020);
- Increasing energy efficiency and green building efforts so that the savings achieved in the 2020 to 2030 timeframe are approximately double those accomplished in 2020; and
- Continuing to implement sound land use and transportation policies to lower VMT and shift travel modes.

The effects of these strategies are presented in Table 33.

Table 33: Potential Distribution of California Greenhouse Gas Emissions by Sector in 2030

Sector	Potential Emissions (MMTCO ₂ E)
Transportation Fuels*	102
Other Fuel Use*	149
Uncapped Sectors	33
Total	284
Capped sector	

With these policies and measures in place, per-capita electricity consumption would decrease by another five percent. Well over half of our electricity demand could be met with zero or near zero greenhouse gas emitting technologies, assuming nuclear and large hydro power holds constant at present-day levels. In response to a lower cap on emissions, existing coal generation contracts would not be renewed, or carbon capture and storage would be utilized to minimize emissions. The remaining electricity generation would come from natural gas combustion either in cogeneration applications or from highly efficient generating units.

By 2030, the transportation sector would undergo a similarly massive transition both in terms of the vehicle fleet and the diversity of fuel supplies. Due to the combination of California's clean car standards (ARB's ZEV program and the Low Carbon Fuel Standard), the number of battery-electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles would increase dramatically, to about a third of the vehicle fleet. Flex-fuel vehicles would comprise a large fraction of the remaining fleet, with more efficient gasoline and diesel vehicles making up the difference. Electricity, advanced biofuels, improved gasoline and diesel, renewable natural gas and hydrogen would all play a role in powering this high-tech fleet of efficient vehicles.

Regional land use and transportation strategies would grow in importance and would reverse the trend of per-capita vehicle miles traveled, a reduction of about eight percent below business-as-usual in 2030. With ambitious but reasonable action, statewide passenger vehicle greenhouse gas emissions could be reduced to half of 2020 levels in 2030, which is also about half of business-as-usual for 2030. Efficiency strategies and low carbon fuels for heavy-duty and off-road vehicles, as well as for ships, rail, and aviation, would need to be greatly expanded in order to achieve additional reductions from the transportation sector in 2030.

In tandem with efficiency measures that lower demand for electricity, natural gas and transportation fuels, California's cap-and-trade program would incent large industrial sources as well as commercial and residential natural gas customers to further reduce emissions. By tightening the cap over time, it is expected that facilities in the industrial and natural gas sectors would achieve reductions well beyond those needed to meet the 2020 emissions cap.

The Proposed Scoping Plan proposes several measures for reducing high GWP gases that collectively, will substantially reduce emissions. With a transition toward reduced consumption of these gases, improved containment in their end uses, and substitution of low GWP alternative gases, it is expected that emissions from this sector could decrease by 75 percent between 2020 and 2030.

For uncapped sectors, we assume that the agriculture sector will reduce emissions by about 15 percent between 2020 and 2030. Net forest uptake of CO₂ must be preserved or enhanced, likely through both expansion of forests and reduction in carbon loss from forest fires, which are predicted to increase over this time period. This example assumes a 10 percent reduction in direct landfill emissions from the recycling and waste sector; however, aggressive implementation of the suite of measures proposed in this Plan could further reduce emissions from this sector by 2030.

In total, the measures described above would produce reductions to bring California's statewide greenhouse gas emissions to an estimated 284 MMTCO₂E in 2030. While the potential mix of future climate policies articulated in this section is only an example, it serves to demonstrate that the measures in the Proposed Scoping Plan can not only move California to its 2020 goal, but also provide an expandable framework for much greater long-term greenhouse gas emissions reductions.

D. Conclusion

California's commitment to address global warming has never been greater. The vast amount of interest, support, and input that ARB has received since this plan began to take shape is evidence of a clear understanding of the need to take action and support for the State's efforts to lead the way. The time has come to shift away from a 'business-as-usual' approach to climate change and to move toward the lasting and sustainable goal of a clean energy future.

Reaching our goals will take a great deal of leadership, commitment, and a willingness to embrace new approaches and seek out new solutions. California's plan to reduce greenhouse gas emissions must also take into account the impacts of this transition and be designed in particular to address the needs of low-income communities, small businesses, and California's working families.

Reaching our goals will also require involvement and support from all levels of government in California, and a coordinated effort with other states, regions, and countries. The solutions and technologies we develop here will be used around the world to help others transition to a clean energy future and contribute to the fight against global warming.

Reaching our goals will also require flexibility. As we move forward, we must be prepared to make mid-course corrections. AB 32 wisely requires ARB to update its Scoping Plan every five years, thereby ensuring that California stays on the path toward a low carbon future.

This plan is part of a new chapter for California that in many ways began with the passage and signing of AB 32. It proposes a comprehensive set of actions designed to reduce greenhouse gas emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health. The challenge California has taken on is large but the opportunities are even greater. It is now time to turn this plan into action.

ACKNOWLEDGMENTS

This Proposed Scoping Plan was prepared by the Air Resources Board. This document was made possible by the hard work of numerous contributors. Below is a list of advisory committees and State agencies that directly provided input to this Proposed Scoping Plan.

Team Support

Climate Action Team

Climate Action Team Sector Subgroups

- Agriculture
- Cement
- Energy
- Forest
- Green Buildings
- Land Use
- Recycling and Waste Management
- State Fleet
- Water-Energy
- Economics

Advisory Committees

Market Advisory Committee

Environmental Justice Advisory Committee

Economic and Technology Advancement Advisory Committee

State Agencies

Governor's Office of Planning and Research	Department of General Services
California Environmental Protection Agency	Department of Parks and Recreation
Business, Transportation and Housing Agency	Department of Public Health
Resources Agency	Department of Toxic Substances Control
State and Consumer Services Agency	Department of Transportation
Department of Food and Agriculture	Department of Water Resources
California Energy Commission	Housing and Community Development
California Public Utilities Commission	Integrated Waste Management Board
California Transportation Commission	Office of Environmental Health Hazard Assessment
Department of Conservation	State Water Resources Control Board
Department of Forestry and Fire Protection	Department of Pesticide Regulation

TITLES 13 AND 17. CALIFORNIA AIR RESOURCES BOARD**NOTICE OF PUBLIC HEARING TO CONSIDER THE ADOPTION OF A PROPOSED REGULATION TO REDUCE EMISSIONS FROM IN-USE ON-ROAD DIESEL VEHICLES, AND AMENDMENTS TO THE REGULATIONS FOR IN-USE OFF ROAD VEHICLES, DRAYAGE TRUCKS, MUNICIPALITY AND UTILITY VEHICLES, MOBILE CARGO HANDLING EQUIPMENT, PORTABLE ENGINES AND EQUIPMENT, HEAVY DUTY ENGINES AND VEHICLE EXHAUST EMISSIONS STANDARDS AND TEST PROCEDURES AND COMMERCIAL MOTOR VEHICLE IDLING**

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider adopting a regulation to reduce emissions of diesel particulate matter (diesel PM), oxides of nitrogen (NOx), and greenhouse gases from in-use on-road diesel vehicles that operate in California. The proposed regulation would also establish requirements for any in-state or out-of-state motor carrier, California-based broker, or any California resident who hires or dispatches vehicles subject to the regulation. The Board will also consider amendments to several existing regulations to ensure that these regulations and the proposed regulation work together effectively, to clarify a number of issues with the existing regulations to provide additional compliance flexibility, and to improve enforceability in general. Specifically, the proposal would amend existing regulations for in-use off-road diesel vehicles, mobile cargo handling equipment at ports and intermodal rail yards, in-use on-road diesel-fueled heavy-duty drayage trucks, on-road heavy-duty diesel-fueled vehicles owned or operated by public agencies and utilities, reducing idling emissions from new and in-use trucks, heavy duty engines and vehicle exhaust emissions standards and test procedures, the airborne toxic control measure (ATCM) for portable diesel engines rated at 50 horsepower and greater, and the portable equipment registration program.

This notice summarizes the proposed regulatory action, including the regulation proposed for adoption and the regulations proposed for amendment. The staff report (Initial Statement of Reasons) and a technical support document present the proposed regulations and information supporting the adoption or amendment of the regulations in greater detail.

DATE: December 11, 2008

TIME: 9:00a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium
1001 I Street
Sacramento, California 95814

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., December 11, 2008, and may continue at 8:30 a.m., December 12, 2008. This item may not be considered until December 12, 2008. Please consult the agenda for the meeting, which will be available at least ten days before December 11, 2008, to determine the day on which this item will be considered.

During the course of the Board's consideration of this proposal, it may adjourn to allow the public and interested parties to view new and emerging technologies that are being developed for use in complying with the proposed rulemaking.

For individuals with sensory disabilities, this document and other related material can be made available in Braille, large print, audiocassette, or computer disk. For assistance, please contact ARB's Reasonable Accommodations/Disability Coordinator at 916-323-4916 by voice or through the California Relay Services at 711, to place your request for disability services, or go to <http://www.arb.ca.gov/html/ada/ada.htm>.

If you are a person with limited English and would like to request interpreter services to be available at the Board meeting, please contact ARB's Bilingual Manager at 916-323-7053.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

A. Sections Affected: Proposed adoption to California Code of Regulations (CCR); title 13, new section 2025, entitled "Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants from In-Use Heavy-Duty Diesel-Fueled Vehicles;" Proposed amendments to CCR, title 13, section 2020, "Purpose and Definitions of Diesel Particulate Matter Control Measures;" Proposed amendments to CCR, title 13, sections 2022 and 2022.1, "Diesel Particulate Control Measure for Municipality or Utility On-Road Heavy-Duty Diesel-Fueled Vehicles;" Proposed amendments to CCR, title 13, section 2027, "Regulation to Control Emissions from In-Use On-Road Diesel-Fueled Heavy-Duty Drayage Trucks;" Proposed amendments to CCR, title 13, sections 2449 and 2449.3, "Regulation for In-Use Off-Road Diesel-Fueled Fleets;" Proposed amendments to CCR, title 13, sections 2451, 2452, 2453, 2455, 2456, 2458, 2461, and 2462 of the "Statewide Portable Equipment Registration Program;" Proposed amendments to CCR, title 13, section 2479, "Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Railyards;" Proposed amendments to CCR, title 13, section 2485, "Airborne Toxic Control Measure to Limit Diesel Fueled Commercial Motor Vehicle Idling;" Proposed amendments to CCR, title 13, section 1956.8, "Exhaust Emissions Standards and Test Procedures-1985 and Subsequent Model Heavy-Duty Engines and Vehicles;" and Proposed amendment to CCR, title 17, sections 93116.1, 93116.2 and 93116.3 of the "Airborne Toxic Control Measure for Diesel Particulate Matter from Portable Engines Rated at 50 Horsepower and Greater."

B. Background: Proposed Regulation to Reduce Emissions of Diesel PM and NOx from In-Use On-Road Diesel Vehicles

Over the past 30 years, as part of its mission to protect public health, the Board has established requirements to reduce emissions from new and in-use on-road motor vehicles and engines, and other sources. Since 1990, ARB and the United States Environmental Protection Agency (U.S. EPA) have worked together to harmonize emission control requirements for new heavy-duty diesel engines. In 2001, ARB adopted amendments that aligned the California exhaust emission standards for heavy-duty diesel engines with those promulgated by the U.S. EPA for 2007 and subsequent model year engines. The standards represented a 90 percent reduction of NOx emissions, 72 percent reduction of non-methane hydrocarbon, and 90 percent reduction of particulate matter (PM) emissions compared to 2004 model year standards. When fully implemented, it is anticipated that the emissions reductions from the new emissions standards will only be achieved with diesel particulate filters and NOx exhaust aftertreatment.¹ Because of the long useful lives of diesel engines, through normal replacement of older vehicles, these newer lower emitting engines will be introduced into the state and national fleets relatively slowly. Consequently, contribution of these emissions reductions in meeting national ambient air quality standards (NAAQS) for fine particulate matter (PM2.5) and ozone will be slow to materialize. The proposed regulation would provide the necessary emissions reductions by the mandatory deadlines for meeting the NAAQS for PM2.5 and ozone by requiring the installation of retrofits for PM exhaust emissions control on existing engines and by accelerating the introduction of cleaner engines into fleets operating in California.

Control of Toxic Air Contaminants

The California Toxic Air Contaminant Identification and Control Program (Air Toxics Program), established under California law by Assembly Bill 1807 (Stats. 1983, Ch. 1047) and set forth in Health and Safety Code (HSC) sections 39650 through 39675, requires ARB to identify and control toxic air contaminants (TAC) in California. The identification phase of the Air Toxics Program requires ARB, with the participation of other state agencies, such as the Office of Environmental Health Hazard Assessment, to evaluate the health impacts of, and exposure to, substances, and to identify those substances that pose the greatest health threat as TACs. ARB's evaluation is made available to the public and is formally reviewed by the Scientific Review Panel (SRP) established under HSC section 39670. Following ARB's evaluation and the SRP's review, the Board, pursuant to section 39662, may formally identify a TAC at a public hearing. Following identification, HSC sections 39658, 39665, 39666, and 39667 require ARB, with the participation of the air pollution control and air quality management districts (districts), and in consultation with affected sources and interested parties, to prepare a report on the need and appropriate degree of regulation for that substance and to adopt airborne toxic control measures (ATCM).

¹ NOx is a precursor to both PM2.5 and ozone.

In 1998, the Board identified particulate matter emitted from diesel engines (diesel PM) as a TAC and in 2001, adopted the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (Diesel Risk Reduction Plan or diesel RRP). The diesel RRP identified ATCMs and regulations that would set more stringent exhaust emission standards for new diesel-fueled engines and vehicles, establish retrofit requirements for existing engines, vehicles, and equipment, and require the sulfur content of diesel fuel to be reduced to no more than 15 parts per million by weight (ppmw). The new sulfur standard was needed to enable the performance of the emission control technologies. The scope of the Diesel RRP was broad, addressing all categories of engines, both mobile and stationary, and included control measures for private and public fleets of on-road and off-road diesel vehicles. The ultimate goal of the Diesel RRP was to reduce California's diesel PM emissions and associated cancer risks from 2000 baseline levels by 85 percent by 2020.

Attainment of Ambient Air Quality Standards

The federal Clean Air Act (CAA) requires U.S. EPA to establish NAAQS for pollutants considered harmful to public health, including fine particulate matter (PM_{2.5}) and ozone. The standards are based on a review of health studies by experts and a public process and are set at levels which are protective of public health. Ambient PM_{2.5} is associated with premature mortality, aggravation of respiratory and cardiovascular disease, asthma exacerbation, chronic and acute bronchitis and reductions in lung function. Ozone is a powerful oxidant and exposure to this pollutant can result in reduced lung function, increased respiratory symptoms, increased airway hyper-reactivity, and increased airway inflammation. Exposure to ozone is also associated with premature death, hospitalization for cardiopulmonary causes, and emergency room visits for asthma.

The existing fleets of heavy-duty diesel trucks are among the largest contributors to PM_{2.5} and ozone forming emissions. The vehicles affected by the proposed regulation produce approximately 40 percent of the statewide emissions of oxides of nitrogen (NO_x) and about 32 percent of the statewide PM emissions generated by diesel mobile sources.

Fifteen areas in California are designated nonattainment of the federal ozone standard, including the South Coast Air Basin, the San Joaquin Valley, the Sacramento region, San Diego, Ventura, and a number of air districts downwind of urban areas. In addition, the South Coast Air Basin and the San Joaquin Valley are designated nonattainment of the federal PM_{2.5} standard. Federal law mandates the development of State Implementation Plans documenting the actions the state will take to attain the federal air quality standards in these areas.

In September 2007, ARB adopted a State Implementation Plan (SIP) committing the State to develop measures to achieve emission reductions from sources under State regulatory authority. The reductions are needed to attain the NAAQS for ozone and PM_{2.5}. While multiple areas across the State exceed federal air quality standards, the air quality in the South Coast and the San Joaquin Valley poses the greatest challenge and defines the amount of reductions needed. Reductions are needed by 2014 to meet

the PM2.5 attainment deadline and by 2023 to meet the ozone attainment deadline. An interim target date of 2017 was adopted by ARB for the San Joaquin Valley to meet the ozone NAAQS as part of an effort to accelerate progress toward attainment before 2023.

The largest share of new emission reductions in the 2007 SIP is expected from trucks. In 2014, reductions from both NOx and PM2.5 are needed to meet the federal air quality standard for PM2.5. To meet the emission reduction targets necessary to meet the ozone NAAQS in 2017 and 2023, the focus of emission reductions is on NOx. Accordingly, in its SIP submittals to U.S. EPA, ARB has adopted 2014 reduction commitments for both NOx and PM2.5, and further NOx reduction commitments in 2017, 2020 and 2023. As part of the overall SIP commitment, ARB staff is also obligated to bring measures to the Board for its consideration. This rule is one of these commitments. ARB staff has used the targeted reductions estimated in the SIP as the goal for this rulemaking.

The California Global Warming Solutions Act of 2006

The California Global Warming Solutions Act of 2006 established requirements for a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of greenhouse gases (GHG).² The legislation gave ARB responsibility for monitoring and reducing GHG emissions. The statute requires ARB to adopt regulations and other requirements that would reduce by 2020 statewide GHG to the equivalent of 1990 levels.

C. Background: The Proposed Amendments to Existing Regulations

Purpose and Definitions of Diesel Particulate Matter Control Measures: This regulation (section 2020 of title 13, GCR) defines terms that apply generally to the regulations that control diesel PM emissions from on-road vehicles. It was adopted by the Board in July 2003 and modified in February 2005.

Municipality or Utility On-Road Heavy-Duty Diesel-Fueled Vehicles: ARB adopted this regulation in December 2005 to reduce public exposure to diesel PM emissions from on-road heavy-duty diesel fueled vehicles owned or operated by public agencies or utilities. The regulation requires municipalities and utilities to apply best available control technology (BACT) to on-road heavy-duty diesel-fueled vehicles with a 1960 to 2006 model year medium heavy-duty or heavy heavy-duty engine having a manufacturer's gross vehicle weight rating (GVWR) greater than 14,000 pounds. BACT can be an alternative fuel engine, a diesel engine certified to a 0.01 grams per brake

² Established under California law by Assembly Bill 32 (Stats. 2006, ch. 488) and set forth in HSC § 38500 et seq. Greenhouse gases are those that tend to increase average global temperatures through absorption of infrared radiation or other mechanisms. These include, but are not limited to, carbon dioxide (CO₂) and methane (CH₄)

horsepower-hour (g/bhp-hr) PM standard, or application of the highest level ARB verified diesel emission control strategy (DECS) to a diesel engine: A municipality or utility may receive credit toward their BACT requirement by retiring a vehicle.

The rule divides these engines into three model year groups: Group 1 (1960-1987), Group 2 (1988-2002), and Group 3 (2003-2006). BACT must be applied according to a specified implementation schedule that sets compliance deadlines and the percentage of the fleet that must be equipped with BACT by each deadline.

Regulation for In-Use On-Road Diesel-Fueled Heavy-Duty Drayage Trucks: In December 2007, ARB adopted a regulation to reduce emissions from diesel-fueled drayage trucks - described as trucks that transport containers, bulk, and break-bulk goods to and from ports and intermodal rail yards. The regulation applies to owners and operators of diesel-fueled drayage tractors having a GVWR greater than 33,000 pounds that operate at California ports, intermodal rail yards, or both. There are approximately 100,000 drayage tractors of which nearly 20,000 frequently service ports and rail yards.

The requirements of the regulation will be implemented in two phases. In Phase 1, by December 31, 2009, all drayage trucks must be equipped with a 1994 to 2003 model year engine and a level 3 verified DECS for PM emissions or they must be equipped with a 2004 model year or newer engine. In Phase 2, all drayage tractors are required to meet the 2007 model year engine standard by December 31, 2013. All drayage trucks involved in work at affected ports and rail yards must be registered in the ARB's drayage truck registry (DTR) by late 2009.

Regulation for In-Use Off-Road Diesel Vehicles: In July 2007, ARB adopted a regulation to reduce diesel PM and NOx emissions from in-use off-road heavy-duty diesel-fueled engines with maximum power of 25 horsepower (hp) or greater. These engines are used to provide motive power in a workover rig or any other motor vehicle that cannot be registered and driven safely on-road, and is not an implement of husbandry or recreational off-highway vehicle. The regulation applies only to engines that drive self-propelled vehicles (that is, it does not apply to stationary equipment or portable equipment like generators). Examples include loaders, crawler tractors, skid steers, backhoes, forklifts, and airport ground support equipment.

The regulation establishes fleet average emission rate targets for PM and NOx for all off-road vehicles operating in the State. By the applicable compliance date for each year, the regulation requires each fleet to meet the fleet average emission rate targets for PM or apply the highest level verified DECS to 20 percent of its horsepower. Each year, the regulation also requires large and medium fleets to meet the fleet average emission rate targets for NOx or to turn over a certain percent of their horsepower (8 percent in early years, and 10 percent in later years). "Turn over" means repowering with a cleaner engine, rebuilding the engine to a more stringent emissions configuration, retiring a vehicle, replacing a vehicle with a new or used piece, or designating a dirty

vehicle as a low-use vehicle. If retrofits that reduce NOx emissions become available, they may be used in lieu of turnover as long as they achieve the same emission benefits.

Large fleets are subject to the PM and NOx requirements beginning in 2010. Medium fleets are subject to the PM and NOx requirements beginning in 2013. Small fleets are subject only to the PM requirements beginning in 2015.

Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards: In December 2005, ARB adopted the Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards to reduce emissions of diesel PM and NOx from these vehicles. Mobile cargo handling equipment includes any motorized vehicle equipped with a diesel-cycle engine that is used primarily off road at a port or intermodal rail yard to handle cargo or to perform scheduled or predictable maintenance or repair activities. The regulation includes requirements, based on BACT, for equipment newly added to a fleet on or after January 1, 2007, as well as for in-use equipment. Vehicles such as mobile cranes and sweepers were required to comply beginning December 31, 2007, for the oldest engines, and compliance is phased in through 2013, depending on the number of vehicles in the fleet and the age of a vehicle's engine.

Statewide Portable Equipment Registration Program: In March 1997, the Board adopted a regulation establishing the Statewide Portable Equipment Registration Program (PERP) which became effective on September 17, 1997. The Board has since approved amendments to the Statewide Regulation on December 11, 1998, February 26, 2004, June 22, 2006, and March 22, 2007. The regulation includes record keeping and reporting requirements and sets fee schedules for registration and inspection of the portable engines and equipment that have registered in the program. Most of the engines associated with portable equipment are diesel fueled, making these engines also subject to the requirements of the Portable Engine ATCM.

Portable Engine ATCM: In February 2004, ARB adopted an ATCM that requires a phase-in of cleaner technologies that would result in the reduction and eventual elimination of high-emission engines. The ATCM requires most portable engines larger than 50 hp that were permitted by local air quality management or air pollution control districts (air districts) or registered in PERP as of December 31, 2005, to be certified to Tier 1, 2, or 3 U.S. EPA new off-road engine emission certification standards by January 1, 2010. Uncertified diesel engines that are designated as emergency use or low use may operate beyond 2010 if they will be replaced with Tier 4 engines within two years of such engines becoming available. In addition, starting in 2013, all fleets of portable engines would have to meet diesel PM emission averages that become progressively more stringent in 2017 and 2020. In March 2007, the ATCM was amended to allow statewide registration and district permitting of Tier 1 and Tier 2 engines that had been operating in California between March 1, 2004 and October 1, 2006. These amendments also allowed local air districts to permit resident uncertified engines at their discretion. In order to be registered in PERP after January 1, 2010, the ATCM requires that the engines must be certified to the most

stringent ARB or U.S. EPA off-road emission certification standards in effect at the time of application. The current ATCM does not have a time limit for when a district must stop issuing new permits for uncertified engines

A TCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling: The ARB adopted the Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling in July 2004 and amended it in October 2005. The ATCM requires diesel-fueled vehicles over 10,000 pounds GVWR to comply with a five-minute idling restriction at all times and at any location. Starting with the 2008 model year, new truck engines are also required to either be equipped with a non-programmable and tamper-resistant engine shutdown system that automatically shuts down the engine after 5 minutes of idling or optionally to meet a NOX idling standard of 30 grams per hour. The engine shutdown system could be overridden when the engine is operating power take-off (PTO) equipment. Operators of pre-2008 model year trucks are required to manually shut down the vehicle's engine after five minutes of continuous idling. The idling limitations would not apply when idling is necessary to perform work for which the vehicle was designed.

Exhaust Emissions Standards and Test Procedures - 1985 and Subsequent Model Heavy-Duty Engines and Vehicles: Section 1956.8 of the CCR specifies exhaust emissions standards and test procedures applicable to 1985 and subsequent model year heavy-duty engines and vehicles'. With the adoption of the sleeper berth idling provisions of the Commercial Motor Vehicle Idling ATCM, section-1956.8 regulation was modified to add new engine requirements for new 2008 and subsequent model year on-road diesel engines with a GVWR greater than 14,000 pounds to be equipped with an engine shutdown system that automatically shuts down the engine after five minutes of continuous idling. In lieu of the engine shutdown system requirement, manufacturers may optionally certify their engines to a NOx idling emission standard of 30 grams per hour under loaded, low and high idle operating conditions. The engine requirements of section 1956.8 would have to be amended as necessary to be consistent with any modifications to the Commercial Motor Vehicle Idling ATCM.

D. DESCRIPTION OF THE PROPOSED REGULATORY ACTION - PROPOSED REGULATION TO REDUCE EMISSIONS OF DIESEL PM AND NOX FROM IN-USE ON-ROAD DIESEL VEHICLES

Applicability

The proposed new regulation would apply to any person, business, or federal government agency that owns or operates affected vehicles in California. Affected vehicles include heavy-duty diesel-fueled vehicles with a GVWR greater than 14,000 pounds, yard trucks with off-road certified engines and diesel-fueled shuttle vehicles of any GVWR that have a capacity of 10 or more passengers and routinely drive an average of 10 trips per day to or from airport terminals, marine terminals, and rail based stations. Drayage trucks and utility owned vehicles would be subject to the regulation beginning January 1, 2021. The proposed regulation would be applicable regardless of where the vehicle is registered. The proposed regulation would also

establish requirements for any in-state or out-of-state motor carrier, California-based broker, or any California resident who hires or dispatches vehicles subject to the regulation. California sellers of a vehicle subject to the proposed regulation would have to disclose the regulation's potential applicability to buyers of the vehicles. The proposed regulation would not apply to military tactical support vehicles, authorized emergency vehicles, and private motor homes not used for commercial purposes.

Performance Requirements

In general, the regulation would require owners to reduce PM and NOx emissions from their fleet by upgrading the vehicles to meet BACT standards for PM and NOx. The BACT standard for PM is an engine equipped with the highest level verified DECS for PM or an engine originally equipped with a diesel particulate filter by the engine manufacturer. The BACT standard for NOx is an engine newly manufactured in 2010 or later or a 2010 emissions equivalent engine.

A fleet may meet these performance requirements by retrofitting a vehicle with a verified DECS³ that will achieve PM or NOx reductions or both as required, replacing an engine with a newer cleaner one, or replacing a vehicle with one having a cleaner engine.

The regulation provides three options for complying with the performance requirements. First, a fleet would be able to comply with a prescribed BACT schedule that would determine the number of verified DECS that must be installed and the required vehicle replacements based on the vehicle's engine model year. Second, a fleet could meet a BACT percent limit option that sets the minimum number of verified DECS to be installed and the minimum number of engines required to meet the 2010 engine requirements each year. Third, a fleet could meet a fleet average option. The owner would use PM and NOx emission factors established by the regulation to calculate the average emissions of the fleet. By the applicable compliance date each year, the owner would have to demonstrate that the fleet met the PM and NOx fleet average emission rate targets set by the regulation. The targets would decline over time, requiring fleets to reduce their emissions further as time goes on.

During the first two years of the regulation, starting January 1, 2011, fleets would be required to install PM verified DECS for certain engine model years. The regulation would then require owners to reduce both PM and NOx emissions from the fleet by accelerating engine or vehicle replacement between January 1, 2013 and the end of 2022 so that by January 1, 2023, all engines would be the cleanest available - that is, having a 2010 or later model year engine or be retrofitted to achieve equivalent emission reductions.

³ A retrofit device that has been verified under ARB's Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines, title 13, CCR, sections 2700 et seq.

in coordination with changes being made to other regulations regarding dual engine street sweepers, the auxiliary engine on the street sweepers would be required to meet the PM performance requirements on the same schedule as that of the propulsion engine. The operation of Tier 0 auxiliary engines on dual engine street sweepers would be limited to a maximum of 250 hours per year until January 1, 2014 and then lowered to a maximum of 100 hours per year thereafter.

Special Provisions for Small Fleets

Fleets with one to three vehicles would be exempt from the 2010 and 2011 PM exhaust retrofit requirements. By January 1, 2013, small fleets would need to show they consist of at least one vehicle equipped with a 2004 model year or newer engine and a PM exhaust retrofit. By January 1, 2018 that vehicle would need to meet the PM and NOx performance requirements. The second vehicle in a fleet with two vehicles would be required to meet the PM and NOx performance requirements by January 1, 2014. A fleet of three vehicles could comply in one of two ways: (1) by having its two remaining vehicles meet the PM and NOx performance requirements by January 1, 2014 or (2) electing to have its second vehicle meet the 2010 engine emissions requirements by January 1, 2014 and the third vehicle meet the PM and NOx performance requirements by January 1, 2016.

Exemptions, Compliance Extensions and Special Circumstances

The proposed regulation would exempt all vehicles operated less than 1000 miles and 100 hours per year (low-use vehicles) from the regulation's PM and NOx performance requirements. These vehicles would still, however, be subject to the regulation's reporting requirements.

Schoolbuses would be exempt from any NOx performance requirements. The regulation would also exempt the following vehicles from the NOx performance requirements until the dates listed below:

- January 1, 2018
 - o Cab-over-engine truck tractors exclusively pulling 57 foot trailers
- January 1, 2021
 - o Unique vehicles;
 - o Vehicles that operate exclusively in counties that the regulation identifies as attainment of the federal ozone and PM ambient air quality standards and do not contribute to downwind exceedances of the state ozone standard;
 - o Vehicles with a GVWR less than 33,000 pounds that are operated less than 5000 miles. Those using power take off (PTO) to perform work while stationary must also operate the engine less than 175 hour per year; and
 - o Truck tractors and vehicles with a GVWR greater than 33,000 pounds that are operated less than 7500 miles. Those using PTO to perform work while stationary must also operate less than 250 hours per year;

- o Yard tractors that operate less than 250 hours per year.

The regulation would also provide a compliance extension for fleets that take action to comply early. If a fleet installs the highest level verified DECS on one or more vehicles by January 1, 2010, the vehicle would be exempt from the NOx performance requirements until January 1, 2014 for each of those vehicles.

The proposed regulation would also allow a fleet to use hybrid vehicles for credit toward compliance with the fleet average as long as the fleet can demonstrate that the fuel economy of the hybrid vehicle is at least 20 percent better than an equivalent vehicle. The credit would expire January 1, 2018. The proposed regulation would allow the fleet to double count the number of hybrid vehicles in the fleet that may be used to calculate the PM and NOx indices and fleet average target rates or for determining the percent limit requirements.

Credit would also be granted for fleets using vehicles equipped with alternative fuel or heavy-duty pilot ignition engines in calculating the NOx and PM fleet average target rates for determining compliance with the fleet average option. The PM emission factor would be zero and the NOx emission factor would be based on the engine model year to which the engine has been certified.

The proposed regulation would also provide fleets with effective compliance extensions if the retrofits, repowers, or new engines needed for compliance with the regulation are not available because of manufacturer delays.

Special Provisions for Agricultural Vehicles

The proposed regulation would provide certain heavy-duty on-road diesel vehicles used in agricultural operations (agricultural vehicles) with additional time to meet the PM and NOx performance requirements. Agricultural vehicles are those vehicles that are used exclusively in agricultural and forest operations, those used exclusively to transport agricultural products to the first point of processing after harvest, and certain heavy-duty vehicles that exclusively deliver fertilizer or crop protection products from a distribution center to farms.

The regulation would allow agricultural vehicles that operate below specified mileage thresholds to delay compliance with the performance requirements provided they remain below the specified thresholds. Agricultural vehicles that operate over the thresholds would be required to meet the same requirements as other on-road vehicle fleets. The mileage thresholds to qualify for exemption and the period of exemption are as follows:

- for vehicles that operate below 10,000 miles annually until January 1, 2023;
- for vehicles with engine model year 1995 and older that operate up to 15,000 miles annually until January 1, 2017;
- for vehicles with engine model year 1996 through 2005 operate below 20,000 miles until January 1, 2017;

- for vehicles with engine model year 2006 and newer that operate below 25,000 miles until January 1, 2017.

The regulation would also define a limited number of specialty agricultural vehicles that would be exempt from the NO_x and PM performance requirements until January 1, 2023.

By January, 2010, the proposed regulation would require an agricultural vehicle fleet owner to designate the agricultural vehicles in its fleet that qualify for exemption. Once the fleet owner has identified and designated the agricultural vehicles in its fleet that qualify for compliance under a specific mileage threshold category, it cannot add any further vehicles to that category. By January 1, 2023 all heavy-duty on-road diesel agricultural vehicles would be required to meet 2010 model year engine emissions' requirements regardless of annual mileage driven.

Record Keeping and Reporting Requirements

Fleet owners who chose the BACT compliance schedule would not be required to report on their fleets. Under the proposed regulation, all other fleets would be required to report their affected vehicles and associated engine data annually to ARB starting in 2010. These fleets would also be required to keep records of all data reported, as well as any changes made to their respective fleets since the last report filed until December 31, 2022, or as long as the owner owns the vehicles.

At the hearing, the Board may consider other elements that may provide additional flexibility to affected vehicles.

Penalties

Under the proposed regulation, fleets that fail to comply with the regulation's requirements would be subject to penalties consistent with the penalty provisions set forth in the Health and Safety Code.

E. Effect of Proposed Regulation to Reduce Emissions Of Diesel PM and NO_x from In-Use On-Road Diesel Vehicles

The proposed regulation would provide diesel PM and NO_x emissions reductions that would have a substantial positive air quality impact throughout California. By reducing emissions of pollutants that contribute to elevated ambient levels of particulate matter and ozone, the regulation would help achieve attainment of the NAAQS for PM and ozone. Significant additional health benefits would also be obtained with the reductions of ambient levels of diesel PM.

The proposed regulation would not achieve the 2010 or the 2020 goals set forth in the 2000 Diesel RRP of reducing diesel PM by 75 percent and 85 percent, respectively from 2000 baseline levels. Staff projects that the proposed regulation would reduce in-use on-road vehicle diesel PM emissions from the 2000 baseline by 16 percent in 2010 and

80 percent in 2020. However, the proposed regulation would achieve the maximum achievable reductions of diesel PM emissions from in-use on-road diesel vehicles.

The regulation would also reduce diesel PM and NO_x emissions that contribute to exceedances in the State of the NAAQS for both PM_{2.5} and ozone. In 2020, the regulation is expected to reduce diesel PM emissions by 5.6 tons per day and NO_x emissions by about 79 tons per day statewide, which represents a 43 percent reduction in diesel PM and a 23 percent reduction in NO_x from emission levels that would be anticipated in the absence of the regulation.

The proposed regulation would meet or exceed the combined NO_x and PM_{2.5} SIP fleet rule targets in both the South Coast and San Joaquin Valley air basins for all years. In 2014, in the South Coast Air Basin, the SIP target would be met by achieving slightly more PM_{2.5} reductions and slightly less NO_x than expected. The proposed regulation would also help achieve the SIP reduction goals in 2020 for attainment in regions downwind of the South Coast and the San Joaquin Valley air basins.

The emission reductions from the regulation are expected to prevent approximately 9400 premature deaths over the course of the regulation (2800 to 17000, 95 percent confidence interval), and would result in about 150,000 fewer asthma-related cases and 950,000 fewer lost work days. The economic valuation of the health impacts are estimated to range from \$48 to \$68 billion.

The net climate change effect of the proposed regulation would be slightly positive. Staff's analysis of the climate change impact of the proposed regulation addresses only the direct emissions from the affected vehicles. Some actions to comply with the proposed regulation could increase carbon dioxide (CO₂) emissions by increasing fuel consumption, whereas other actions would reduce fuel consumption. For example, a vehicle owner who complies with the regulation by retrofitting the vehicle with a diesel particulate filter (DPF) could potentially experience a decrease in the vehicle's fuel economy of about 2 percent. However, as the fleet is modernized to comply with the regulation, selective catalytic reduction (SCR) is expected to replace exhaust gas-recirculation (EGR) as the primary NO_x emissions control technology. SCR for 2010 model year engines permits operation of the engine at more optimal combustion temperatures to provide better power and fuel efficiency improvements as well as lower PM generation. The expected improvements in fuel economy of 3 to 5 percent would offset the potential climate change impacts of the widespread installation of DPFs on the overall fuel economy of the fleet. The proposed regulation would also reduce emissions of black carbon - a component of diesel PM and a likely contributor to global warming - which would further reduce climate change impacts attributed to the overall impact on fuel economy.

F. DESCRIPTION AND EFFECT OF PROPOSED AMENDMENTS TO EXISTING REGULATIONS

The staff is proposing amendments to the regulations identified above in section C. to clarify a number of issues with the existing regulations, to provide additional compliance flexibility as it relates to the existing regulations and to the proposed new regulation for in-use on-road diesel vehicles, and to generally improve enforceability of the existing regulations. For example, the amendments will clarify that mobile cranes are not subject to multiple regulations with different compliance dates and requirements.

Purpose and Definitions of Diesel Particulate Matter Control Measures: The proposed amendment would modify the definition of "municipality". Under the current definition, agencies of the United States of America are subject to the regulation for municipality and utility heavy-duty diesel vehicles. The proposed amended definition would exclude federal agencies and consequently fleets owned by the federal government would not be subject to the municipality and utility fleet regulation. This modification became necessary after it was determined that CM section 118 did not require federal fleet operators to comply with the municipality and utility fleet regulation because the regulation did not generally apply to nongovernmental entities. Tribal reservations and rancherias would also be excluded in the revised definition of "municipality". Fleets owned and operated by these entities would be subject to the proposed regulation for heavy-duty diesel vehicles.

Municipality and Utility Diesel-Fueled Vehicles: Staff is proposing modifications that would expand the scope of this regulation and would add new language to address ambiguities and omissions in the regulation when initially adopted. Among other things, the proposed amendments would add requirements to ensure that retirement credit is properly granted to fleets. Staff is also proposing changes for utility fleets to improve compatibility with actions needed to comply with the In-Use On-Road Heavy-Duty Vehicle regulation.

Staff's proposed revision of section 2022(a) would expand the scope and applicability of the regulation to include light heavy-duty engines that were inadvertently omitted from the original scope of the regulation. Staff is also proposing to expand the scope to include 2007 model year and newer engines certified under Averaging Banking and Trading (ABT) provisions at PM levels greater than the 2007 model year standard of 0.01 g/bhp-hr. This revision is consistent with the original intent of the regulation to require upgrades of all engines that did not meet the PM BACT standard of 0.01 g/bhp-hr.

A proposed compliance extension provision (section 2022.1 (d)(7)) would allow municipalities and utilities to apply for a one-year extension of the intermediate 2009 compliance deadline for light heavy-duty engines. The municipality or utility would be required to document that the addition of light heavy-duty engines to the scope of the regulation would have prevented the fleet from meeting the 2009 compliance deadline.

Staff is proposing an optional extension for privately-owned utilities (utility) that would provide a two-year delay of the intermediate and final BACT PM deadlines, accompanied by requirements that, by December 31, 2013, thirty percent of a utility's vehicles meet the 2010 engine emission standards, and an additional twenty percent meet the 2007 or newer engine emission standards.

Staff is proposing amendments that would also provide a means of ensuring that owners get BACT credit for vehicles sold out of state and vehicles sold out of state for retirement credit could not be re-sold in California unless they met the BACT requirements. The proposed new language in section 2022.1 (f)(1)(k) would establish a process for qualifying a vehicle that requires the municipality or utility to obtain a Department of Motor Vehicle (DMV) registration hold or "VINStop". Proposed language in section 2022.1 (h) establishes contract requirements for out-of-state sales through a third party vehicle seller. The contract language would ensure that the seller informs buyers of the prohibitions against re-registering or operating retired vehicles in the State.

Staff is also proposing to modify the definition of "retirement" in section 2022(b)(8) to grant credit for the sale within California of dual-engine street sweepers with 2004 - 2006 model year engines, provided that, in the case of private-sector buyers, they comply with the newly proposed on-road diesel vehicles regulation described in section D. above. This would make used street sweepers available for purchase by private fleets and help to reduce the cost of the proposed regulation for these private fleets.

The proposed amendments would add new definitions for "lease", "operate", "sold outside of the State of California", "third party vehicle seller", and "VIN stop" to support the changes being proposed. The definition of "total fleet" was revised to make it consistent with the revised scope of the regulation.

Drayage Trucks: Staff is proposing modifications to the drayage truck regulation to add a phase one requirement for drayage trucks with 2004 - 2006 model year engines, a change in liquefied natural gas (LNG) fueled truck applicability, and clarifications on the applicability of alternative and dual-fueled diesel trucks.

Staff is proposing to require that 2004 model year engines be equipped with the highest level verified DECS for PM by January 1, 2012, and that 2005 model year-2006 model year engines be equipped with the highest level verified DECS for PM by January 1, 2013. This requirement would align the drayage truck regulation with the proposed in-use on-road diesel vehicle regulation. This would help meet the State's PM emission reduction commitments, and would ensure uncontrolled trucks won't cycle into the drayage fleet to avoid the in-use on-road diesel vehicle regulation requirements.

Staff is also proposing additional changes to be consistent with the proposed In-Use Heavy Duty Diesel Vehicle Regulation. Staff is proposing to define pilot injection LNG fueled trucks consistent with the Alternative Fueled vehicle definition. The proposed

change would exempt subject pilot injected LNG fueled trucks from the emission requirements. Staff also is proposing to include 'alternative diesel-fueled and dual-fueled' trucks in the applicability section (b)(1).

Finally, staff is proposing to add or modify the following definitions: "Dual-Fueled Engine", "Alternative Diesel Fuel", "Compression Ignition Engine", and "Diesel-Fueled". All definition additions or changes would not modify the applicability or intent of the drayage truck regulation.

In-Use Off-Road Diesel Fueled Fleets: Staff is proposing to change the scope of the regulation for in-use off-road diesel fueled vehicles to include both the drive engine and the secondary engine of all two-engine cranes operated in California. The drive engine would be included regardless of whether it is certified as an on-road engine or as an off-road engine. Two-engine cranes are currently subject to a number of regulations. The upper engine is subject to the requirements of the portable engine registration program and ATCM for portable engines. The drive engines are subject to the in-use off-road diesel vehicle and would be potentially subject to the proposed in-use heavy-duty diesel vehicle regulation. The drive engine on cranes operating at ports or intermodal rail yards are subject to the requirements of the mobile cargo handling equipment regulation.

Staff is also proposing to modify section 2449.3(b)(2)(c) to exclude the horsepower in two-engine cranes from a fleet's maximum horsepower. This would be consistent with the intent of the existing in-use off-road diesel-fueled regulation that two engine cranes, which were never previously a part of the regulation and never considered that they would be used in determining fleet size and eligibility for the Surplus Off-Road Opt-in for NOx (SOON) program.

New language is proposed in section 2449(e)(15) that would clarify the repower requirements for workover rigs. The regulation would require that any replacement engine must be an on-road engine if the workover rig is to be registered and driven on public roadways.

Staff is proposing to modify section 2449 (e)(7) to clarify the exemption provision for low-use vehicles. The current regulatory language in the section exempts the low-use vehicles from all of the performance requirements in section 2449(d). The proposed modifications would require low-use vehicles to comply with the requirements for adding vehicles to the fleet and with the idling requirement.

Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards: Staff is proposing to exclude sweepers and mobile cranes from the scope of the regulation. No changes would be made regarding rubber-tired gantry cranes. This change would provide consistency for owners and operators who would only be required to comply with one regulation. This proposal in combination with other changes to address cranes would also address other issues such as safety certification, and would provide more compliance flexibility. Many owners of these vehicles only provide service to the ports

on a limited basis and, if not excluded from the mobile cargo handling regulation would have to segregate their vehicles into two separate groupings – those required to comply with the mobile cargo handling regulation and those that would be required to comply, with either the in-use off-road regulation or the proposed in-use on-road regulation.

Portable Engine ATCM: Staff is proposing amendments to the Portable Engine ATCM as it applies to two-engine cranes and dual-engine street sweepers. Until now, the auxiliary engines on these vehicles have been registered in PERP or permitted by local air districts. Under the Portable Engine ATCM, these engines must be replaced by December 31, 2010, if they do not meet U.S. EPA or ARB emission certification standard. In many cases, it is infeasible, if not impossible, to repower these vehicles with new engines; the only alternative would be to replace the entire vehicle, with a new vehicle having a certified engine. To address this, staff is proposing to amend the portable engine ATCM to exclude the secondary engines on two-engine cranes and privately owned sweepers from the requirements of the ATCM. The ATCM would also be amended to delete the diesel PM standards and fleet requirements of title 17, CCR, section 93116.3(b)(4) for lattice boom cranes. Lattice boom cranes would be included in the proposed definition of two-engine cranes that would be added to the in-use off-road diesel-fueled vehicles regulation.

Additionally, staff is proposing that two new sections be added to the Portable Engine ATCM. New section 93116.1 (b)(8), would require the secondary engine on a two-engine crane to comply with the requirements of the regulation for in-use off-road diesel-fueled vehicles, and new section 93116.1 (b)(9) would require the secondary engine on a dual-engine sweeper to comply with the requirements of the proposed regulation for in-use on road diesel vehicles.

Staff is also proposing to amend the portable engine ATCM by adding a new definition for "crane" which would cross-reference to the proposed definition of "two-engine crane," which staff is proposing to add to the regulation for in-use off-road diesel vehicles at title 13, GCR, section 2449(c)(56). The portable engine ATCM adds a new definition "street sweeper" which would cross-reference to the proposed definition of "dual-engine street sweeper," which staff is proposing to add to title 13, GCR, section 2022(b)(2) of the regulation for municipality and utility vehicles.

Statewide Portable Equipment Registration Program: Staff is proposing an amendment of the PERP regulation that would be consistent with the proposed changes to the portable engine ATCM. As with the ATCM, staff is proposing to add new definitions for "crane" and "street sweeper" that would respectively cross-reference to the in-use off-road diesel-fueled vehicles regulation and the municipality and utility fleets regulation.

The proposed amendments would also exempt the secondary engines on two-engine cranes and dual-engine street sweepers from all of the emission requirements of the PERP regulation, except the limits on opacity specified in section 2456(f)(5). Proposed new language would require that the secondary engine on a crane comply with the applicable requirements of title 13, CCR, section 2449 of the regulation for in-use off-

road diesel-fueled vehicles, and that the secondary engine on dual-engine street sweepers comply with the applicable requirements of title 13, CCR, section 2025 of the regulation proposed for in-use on-road diesel vehicles.

Under the proposed amendments, if the secondary engine of a crane or street sweeper is registered in PERP, it would be exempt from the recordkeeping and reporting requirements of the PERP regulation, but would be respectively required to comply with the applicable recordkeeping, reporting and other administrative requirements of the regulation for in-use off-road diesel vehicles and those proposed for the regulation for in-use on-road diesel vehicles.

Secondary engines on cranes and sweepers registered under the statewide PERP would remain subject to the inspection requirements and fees listed in the PERP regulation.

Regulations to Limit Motor Vehicle Idling: Staff is proposing changes to title 13, CCR, section 2485 (Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling) and section 1956.8 (Exhaust Emissions Standards and Test Procedures - 1985 and Subsequent Model Heavy-Duty Engines and Vehicles) to exempt armored cars and workover rigs from the vehicle idling limits. When an armored car is at a pick-up location at least one guard must stay onboard. Since the environment inside of an enclosed armored car can become extremely uncomfortable, idling of the engine for climate control is essential to the health and safety of the guard-onboard. For this reason, staff is proposing to add new section 2485(d)(2)(M) to exempt armored cars idling while providing services for which the vehicle was designed.

Staff is also proposing that the idling requirements for workover rigs be amended. Typically, in vehicles with power take off (PTO), the engine shutdown system is normally overridden when in PTO mode. For most vehicles this occurs when a truck's engine is idling and the engine's power is used to perform certain specialized non-mobile functions. However, unlike other vehicles, workover rigs use PTO to propel the vehicle and do not use PTO to power the specialized work while stationary. Staff is proposing to add a new provision in section 2485(d)(2)(N) to exempt workover rigs from the motor vehicle idling limit while they are performing the work for which the vehicle was specially designed. This proposal would allow a workover rig to carry out its specialized function when the vehicle is stationary and the engine is working.

Staff is proposing to modify the engine requirements of title 13, section 1956.8 of the CCR to be consistent with the change proposed to the Commercial Vehicle idling limit ATCM for workover rigs and armored cars. The proposed changes to these engine requirements would add armored cars and workover rigs to the list of exempted vehicles in section 1956.8(a)(6)(8).

G. COMPARABLE FEDERAL REGULATIONS

Pursuant to its authority under CAA section 202(a), U.S. EPA has established emission standards for new diesel, alternative fuel, and gasoline on-road heavy-duty engines (Title 40, Code of Federal Regulations, Part 86). U.S. EPA, however, does not have authority to establish emission standards for in-use on-road motor vehicles. Although California must obtain a waiver of federal preemption under CAA section 209(b) before implementing new engine emission standards for new motor vehicles sold in California, no federal preemption exists for requirements regarding in-use motor vehicles and engines adopted by the State.

CAA section 209(e)(2) allows California, upon obtaining authorization from U.S. EPA, to adopt and enforce emission standards and other requirements related to the control of emissions for new and in-use off-road engines not expressly preempted (i.e., as set forth in CM section 209(e)(1), new off-road engines under 175 hp used in farm and construction equipment and vehicles and new locomotives and locomotive engines). To the extent that the amendments to ARB's off-road regulations require authorization, ARB will request that U.S. EPA grant such authorization.

There are no federal regulations comparable to the proposed regulation to reduce emissions of diesel PM and NO_x from in-use on-road diesel vehicles that operate in California. Similarly, there are no federal regulations comparable to the existing California on-road regulations that are being proposed to be amended: the regulations to reduce diesel PM emissions from diesel engines owned by municipal and utility fleets, emissions of diesel PM and NO_x from drayage trucks that operate at ports and intermodal rail yards in California, and that portion of the mobile cargo handling regulation that applies to vehicles that may operate on road.

Presently, there are also no comparable federal on-road regulations to California's heavy-duty vehicle idling requirements. The amendments to the California idling requirements do not require a waiver in that the amendments modify an in-use operational control for which states are not preempted. (See CM section 209(d).) This exception has also been applied to off-road engine idling requirements. (See *Engine Manufacturers Association v. EPA* (D.C. Cir. 1996) 88 F.3d 1075.)

There are also no federal regulations comparable to California's in-use off-road regulations that are being proposed to be amended. Those regulations include the mobile cargo handling regulation, the in-use off-road diesel regulation, the portable ATCM and PERP proposed amended regulation to reduce emissions of diesel PM and NO_x from in-use off-road diesel engines that operate in California, including those that operate at ports and intermodal rail yards.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

The ARB staff has prepared two documents for the proposed regulatory action: a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposed action

and a Technical Support Document (TSD) that describe the basis of the proposed action in more detail. The Staff Report is entitled: "Staff Report: Initial Statement of Reasons for Proposed Rulemaking - Regulation to Control Emissions from In-Use On-Road Diesel Vehicles." The Technical Support Document is entitled: Technical Support Document: Proposed Regulation to Control Emissions from In-Use On-Road Diesel Vehicles." Together with the needs assessment (Le., the Diesel RRP), these two documents serve as the report on the need and appropriate degree of regulation for in-use on-road diesel vehicles operating in California.

Copies of the ISOR with the full text of the proposed regulatory language, in underline and strikethrough format to allow for comparison with the existing regulations, where applicable, and the Technical Support Document may be accessed on the ARB's website listed below, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, (916) 322-2990, at least 45 days prior to the scheduled hearing.

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact person in this notice, or may be accessed on the ARB's website listed below.

Inquiries concerning the substance of the proposed regulation may be directed to the designated agency contact persons, Tony Brasil, Manager of the In-Use Control Measures Section, at (916) 323-2927, or Gloria Lindner, from the Heavy Duty Diesel In-Use Strategies Branch, at (916) 323-2803.

Further, the agency representative and designated back-up contact persons, to whom nonsubstantive inquiries concerning the proposed administrative action may be directed, are Lori Andreoni, Manager, Board Administration & Regulatory Coordination Unit, (916) 322-4011, or Trini Balcazar, Regulations Coordinator, (916) 445-9564. The Board has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

This notice, the ISOR, TSD, and all subsequently issued regulatory documents, including the FSOR, when completed, are and will be available on the ARB website for this rulemaking at www.arb.ca.gov/regact/2008/truckbus08/truckbus08.htm.

COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

The determinations of the Board's Executive Officer concerning the costs or savings that would be necessarily incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulations are presented below.

Costs to State Government and Local Agencies

Pursuant to Government Code sections 11346.5(a)(6), the Executive Officer has prepared an estimate in accordance with instructions -adopted by the Department of Finance, of the cost savings to any state agency, the cost to any local agency or school district that is required to be reimbursed under Government Code, title 2, division 4, part 7 (commencing with section 17500), other nondiscretionary cost or savings imposed on local agencies, and the cost or savings in federal funding to the state.

The Executive Officer has determined that while ARB would incur costs to implement and enforce the proposed new regulation to reduce emissions from in-use on-road diesel vehicles, and the amendments to the existing regulations, the adopted regulatory actions will not affect federal funding to the State.

The proposed regulation would also impose additional costs to ARB. ARB staff has identified a need for additional staff and other resources for outreach and education and for the implementation, and enforcement of the proposed regulation. The Executive Officer has further determined that the proposed regulatory action would not create any additional costs or savings for other state agencies. Vehicles owned by state agencies would not be subject to the proposed regulation. State agency vehicles are subject to the existing regulation for municipality or utility fleets. One of the proposed changes to the regulation for municipality or utility fleets would add light heavy-duty engines to the engines currently subject to the regulation. State agencies have already counted these engines in their fleets as was the original intent of the regulation when it was adopted, and had already accounted for them in the cost of compliance with the regulation for municipality and utility fleets. Therefore, State agencies are not expected to incur additional cost as a result of the proposed regulatory action.

Pursuant to Government Code sections 11346.5(a)(5) and (6), the Executive Officer has further determined that the proposed regulatory action would create costs for school districts, and may impose a mandate that would not be reimbursable by the State, pursuant to Government Code, title 2, division 4, part 7 (commencing with section 17500). The mandate which would require schoolbus engines to be retrofitted engines with the best available verified diesel emission control strategy is not reimbursable because the costs would apply to all schoolbus owners, not just school districts, as well as all other heavy-duty vehicles that operate in the State. To the extent that the proposed regulation would require school districts to remove all schoolbuses manufactured before April 1, 1977, that requirement also applies to all schoolbus owners and not to school districts alone. Additionally, school districts qualify for public funding grants under the California Clean School Bus Program (HSC section 4299.90) for replacement of all pre-1997 school buses that were in operation as of December 31, 2005. It is estimated that the direct regulatory cost of the proposed regulation for public school districts is \$27 million from 2010 through 2017 based on 2008 dollars.

Costs to Businesses and Private Individuals

In developing this regulatory proposal, the ARB staff evaluated the potential economic impacts on representative private persons or businesses. The determinations of the Board's Executive Officer, pursuant to Government Code section 11346.5(a)(9), concerning the costs or savings necessarily incurred by representative private persons and businesses in reasonable compliance with the proposed regulations are presented below.

The total cost of the regulation is expected to be \$5.5 billion in 2008 dollars. Approximately \$4.5 billion is attributable to California based vehicles and approximately \$1.0 billion is attributable to vehicles registered out of state. The cost would be spread over the years 2010 to 2030, with the highest costs occurring in the years 2012 and 2013 and the lowest costs occurring in 2014. The total cost is the result of early replacement with newer, cleaner vehicles, cost of retrofit devices, and other annual costs. The cost impact of the in-use on-road heavy-duty diesel vehicle regulation would vary with the different business sectors. A detailed analysis is available in the Staff Report.

Costs to individual fleet owners would vary depending on the size of the fleet, the vehicle types, vehicle age, and normal vehicle replacement practices. Costs also would vary depending on the compliance strategy chosen by each fleet. The average increased cost for in-state heavy heavy-duty vehicles is \$15,800 per vehicle.

Staff has determined that the regulatory action would not have a significant cost impact on a representative private person, above and apart, from a person's occupation as a fleet owner.

Pursuant to Government Code section 11346.5(a)(7)(C), the Executive Officer has made an initial determination that the proposed regulatory action may have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states.

ARB staff has considered proposed alternatives that would lessen any adverse economic impact on businesses and invites you to submit proposals. Submission may include the following approaches for consideration:

- (i) The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to businesses.
- (ii) Consolidation or simplification of compliance and reporting requirements for businesses.
- (iii) The use of performance standards rather than prescriptive standards
- (iv) Exemption or partial exemption from the regulatory requirements for businesses.

Alternatives that staff considered are described in more detail in the Staff Report.

In accordance with Government Code section .11346.3, the Executive Officer has determined that the proposed regulatory action would likely have an effect on the creation or elimination of jobs within the State of California, the creation of new businesses or elimination of existing businesses within the State of California, or the expansion of businesses currently doing business within the State of California. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the Staff Report.

Because of the potential cost imposed by this regulation, it is possible that some businesses with affected fleets would be eliminated. It is also possible that some businesses would choose to consolidate (or merge), change owners, rent vehicles (rather than own), or relocate due to this regulation. It is also very likely that additional businesses would be created or existing businesses expanded to aid in the making, distribution, cleaning, and maintenance of these verified DECS through the duration of the regulation. Overall, staff expects that most affected businesses would be able to absorb or pass on the costs of the proposed regulation with no significant adverse impacts on their profitability.

This regulation would increase the use of verified DECS and accelerate vehicle modernization. It is therefore likely that the regulation would cause many jobs to be created due to this increase in demand for verified DECS, newer engines, and newer vehicles. Staff expects new jobs to be created for the production, sales, installation, and maintenance of verified DECS. Staff estimates that over its course, the regulation would require the installation of over 150,000 verified DECS. Additional businesses could be created to aid in the manufacture, distribution, and maintenance of verified DECS through the duration of the regulation.

The Executive Officer has also determined, pursuant to CCR, title 1, section 4, that the proposed regulatory action would affect small businesses. The proposed regulation defines a small fleet as three or fewer vehicles and allows additional time for compliance. Staff has estimated that 48 percent of all medium heavy-duty and heavy heavy-duty vehicles registered in California are in small fleets. Staff expects that small fleets will, in general, be small businesses. Some small fleets would experience no increased costs while other would experience higher costs. The total estimated cost over the lifetime of regulation for small fleets is approximately \$1.7 billion in \$2008 dollars.

In accordance with Government Code sections 11346.3(c) and 11346.5(a)(11), the Executive Officer has found that the reporting requirements of the regulation which apply to businesses are necessary for the health, safety, and welfare of the people of the State of California. The reporting requirements are necessary for the enforcement of the regulation. Without effective enforcement, the emission reductions and public health benefits associated with the proposed regulation cannot be achieved.

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board, or that has otherwise been identified and brought to the attention of the Board, would be more effective in carrying out the purpose for which the action is proposed, or would be as effective and less burdensome to affected private persons than the proposed action.

SUBMITTAL OF COMMENTS

Interested members of the public may also present comments orally or in writing at the meeting, and in writing or by e-mail before the meeting. To be considered by the Board, written comments submissions not physically submitted at the meeting must be received **no later than 12:00 noon, December 10, 2008**, and addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: <http://www.arb.ca.gov/lispub/comm/bclist.php>

Facsimile submittal: (916) 322-3928

Please note that under the California Public Records Act (Government Code §6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request. Additionally, this information may become available via Google, Yahoo, and any other search engines.

The Board requests, but does not require, that 30 copies of any written statement be submitted and that all written statements be filed at least ten days prior to the hearing so that ARB staff and Board Members have time to fully consider each comment. The Board encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under that authority granted in Health and Safety Code, sections 39600, 39601, 39650, 39658, 39659, 39665, 39666, 39667, 39674, 39675, 40000, 41511, 41752, 41754, 41755, 42400, 42400.1, 42400.2, and 42402.2, 42410, 43000, 43000.5, 43013, 43016, 43018, 43023, 43600. This action is proposed to implement, interpret, or make specific Health and Safety Code sections 39600, 39601, 39650, 39658, 39659, 39666, 39667, 39674, 39675, 40000, 41511, 41752, 41754, 41755, 42400, 42400.1, 42400.2, and 42402.2, 42410, 43013, 43016, 43018, 43023, and 43600.


HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340).

Following the public hearing, the Board may adopt the regulatory language as originally proposed, or with non substantial or grammatical modifications. The Board may also adopt the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice, and that the regulatory language as modified could result from the proposed regulatory action; in such event, the full regulatory text, with the modifications clearly indicated, will be made available to the public, for written comment, at least 15 days before it is adopted.

The public may request a copy of the modified regulatory text from the ARB's Public Information Office, First Floor, Sacramento, California, 95814, (916) 322-2990.

CALIFORNIA AIR RESOURCES BOARD



James N. Goldstene
Executive Officer

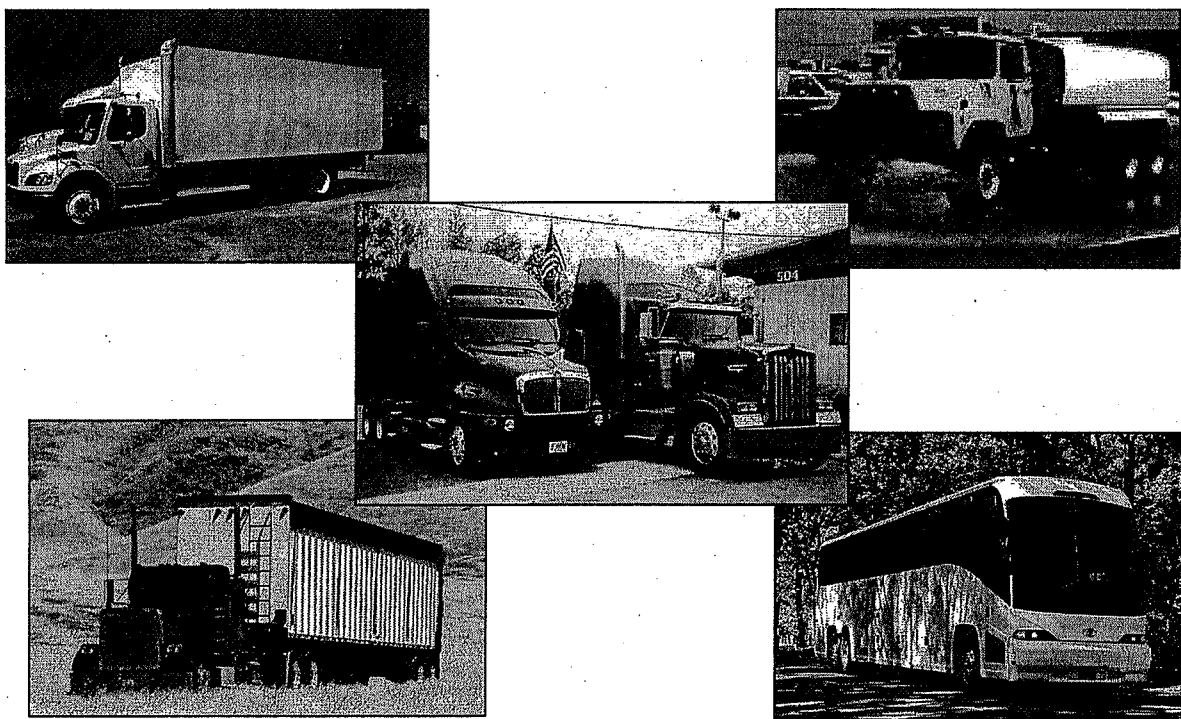
Date: October 14, 2008

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

California Environmental Protection Agency
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED
RULEMAKING

PROPOSED REGULATION FOR IN-USE ON-ROAD DIESEL VEHICLES



Mobile Source Control Division
Heavy-Duty Diesel In-Use Strategies Branch

October 2008

State of California
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS
FOR PROPOSED RULEMAKING

Public Hearing to Consider

ADOPTION OF THE PROPOSED REGULATION FOR
IN-USE ON-ROAD DIESEL VEHICLES

To be considered by the Air Resources Board at a two-day meeting of the Board that will commence December 11, 2008, and may continue to December 12, 2008, at

California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium
1001 I Street
Sacramento, CA 95814

Mobile Source Control Division:
Robert Cross, Chief

Heavy-Duty Diesel In-Use Strategies Branch:
Erik White, Chief

In-Use Control Measures Section:
Tony Brasil, Manager

This **report** has been prepared by the staff of the Air Resources Board. Publication does not signify that the contents reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

State of California
AIR RESOURCES BOARD

PROPOSED REGULATION FOR IN-USE ON-ROAD VEHICLES

Contributing Authors

Gloria Lindner	Jessica Dean
Sherrie Sala-Moore	Boons Baythavong
John Hironaka	Nesamani Kalandiyer
Barry Ho	Mohan Krishnamurthy
Adam Gerber	Joseph Gormley
Ron Nunes	John Gruszecki
Jacqueline Johnson	Mike Sutherland
Brandon Rose	Pingkuan Di
Richelle Bishop	Nicole Dolney
Todd Sax	Reza Mahdavi
Jon Taylor	Hien Tran
Kathy Jaw	Seungju Yoon
Matthew Malchow	Krista Fregoso
Earl Landberg	Ben Ly
Peter Christensen	Alvaro Alvarado
David Kennedy	Corey Bock

Legal Counsel

Michael Terris, Office of Legal Affairs

Supporting Divisions
Planning and Technical Support Division
Research Division
Stationary Source Division

Acknowledgements

This report was prepared with the assistance and support from the other divisions and offices of the Air Resources Board. In addition, we would like to acknowledge the assistance and cooperation that we have received from many individuals and organizations.

TABLE OF CONTENTS

I.	Overview and Staff Recommendation	1
	A. OVERVIEW	1
	B. RECOMMENDATION	5
II.	Need for Emission Reductions	7
	A. How SIGNIFICANT ARE THE EMISSIONS TARGETED BY THE REGULATION?	7
	B. WHY ARE REDUCTIONS OF DIESEL PARTICULATE MATTER EMISSION NEEDED?	9
	C. WHY ARE OXIDES OF NITROGEN EMISSION REDUCTIONS NEEDED?	10
	D. WHAT ARE THE STATE'S SIP COMMITMENTS TO REDUCE EMISSIONS FROM VEHICLES COVERED BY THE PROPOSED REGULATION?	11
	E. WHAT STATEWIDE HEALTH IMPACTS ARE OCCURRING TODAY DUE TO THE EMISSIONS FROM VEHICLES COVERED BY THE PROPOSED REGULATION?	12
	F. WHAT LOCALIZED HEALTH IMPACTS ARE OCCURRING TODAY DUE TO THE EMISSIONS FROM VEHICLES COVERED BY THE PROPOSED REGULATION?	13
	G. WHAT IS THE LOCALIZED POTENTIAL CANCER RISK FROM EXPOSURE TO DIESEL PM EMISSIONS FROM ON-ROAD DIESEL VEHICLES?	14
	H. WHAT NEW ENGINE EMISSION STANDARDS APPLY TO VEHICLES COVERED BY THE PROPOSED REGULATION?	15
III.	Affected Industries and Vehicles	17
	A. WHAT INDUSTRIES AND TYPES OF FLEETS WILL BE AFFECTED BY THE PROPOSED REGULATION	17
	B. How MANY AND WHAT TYPES OF VEHICLES ARE SUBJECT TO THE REGULATION?	18
	C. How MANY VEHICLES ARE OWNED BY SMALL FLEETS?	20
IV.	Description of Proposed Regulation	21
	A. WHO MUST COMPLY WITH THE PROPOSED REGULATION?	21
	B. WHAT VEHICLES ARE AFFECTED BY THE PROPOSED REGULATION?	21
	C. DOES THE REGULATION APPLY TO OUT-OF-STATE COMPANIES?	21
	D. WHAT VEHICLES ARE NOT SUBJECT TO THE PROPOSED REGULATION?	21
	E. WHAT WOULD THE PROPOSED REGULATION REQUIRE?	22
	F. WHAT IS REQUIRED BY THE BACT COMPLIANCE OPTION?	22
	G. WHAT IS REQUIRED BY THE BACT PERCENT LIMIT OPTION?	23
	H. WHAT IS REQUIRED BY THE FLEET AVERAGING OPTION?	24
	I. ARE THERE PROVISIONS FOR SMALL FLEETS?	25
	J. WHAT WOULD THE REGULATION ACTUALLY REQUIRE FLEETS TO DO?	25
	K. WHAT ARE THE REQUIREMENTS FOR SCHOOL BUSES?	27
	L. WHAT ARE THE REQUIREMENTS FOR DRAYAGE TRUCKS?	27
	M. DOES THE REGULATION PROVIDE ANY SPECIAL CREDITS?	28
	N. ARE THERE SPECIAL PROVISIONS FOR LOW-USE VEHICLES?	28

O.	ARE THERE SPECIAL PROVISIONS FOR VEHICLES USED FOR EMERGENCY OPERATION?	28
P.	WOULD AN OWNER HAVE TO REPLACE A VEHICLE THAT IS OPERATED IN LESS POLLUTED AREAS OF THE STATE?	28
Q.	HOW DOES THE REGULATION APPLY TO RENTAL AND LEASE COMPANIES?	29
R.	WHAT ARE THE SPECIAL PROVISIONS FOR AGRICULTURAL VEHICLES?	29
S.	ARE THERE ANY OTHER SPECIAL PROVISIONS?	30
T.	HOW DOES THE REGULATION APPLY TO SELLERS AND DEALERS OF VEHICLES	31
U.	WHAT ARE THE SPECIAL PROVISIONS FOR TWO-ENGINE SWEEPERS?	31
V.	WHAT IF RETROFITS ARE NOT AVAILABLE?	32
W.	WHAT IF THERE ARE DELAYS IN THE AVAILABILITY OF VERIFIED DECS OR NEW VEHICLES?	32
X.	WHAT IF A VERIFIED DECS IS NOT SAFE FOR A PARTICULAR VEHICLE OR VEHICLE APPLICATION?	32
Y.	WHAT ARE THE REPORTING, LABELING AND RECORDKEEPING REQUIREMENTS?	32
Z.	HOW DOES THE REGULATION APPLY TO MOTOR CARRIERS, BROKERS, AND DISPATCHERS?	33
V.	Description of Proposed Changes to Other Existing Regulations	35
A.	WHY ARE AMENDMENTS TO OTHER REGULATIONS BEING PROPOSED?	35
B.	WHAT OTHER EXISTING REGULATIONS ARE PROPOSED TO BE AMENDED?	35
C.	WHAT ARE THE PROPOSED REQUIREMENTS FOR TWO-ENGINE CRANES?	35
D.	WHAT CHANGES TO EXISTING REGULATIONS WILL BE MADE FOR TWO-ENGINE SWEEPERS?	36
E.	WHAT CHANGES ARE PROPOSED FOR THE PUBLIC AGENCY AND UTILITY REGULATION?	36
F.	WHAT OTHER CHANGES ARE BEING PROPOSED TO THE PERP?	36
G.	WHAT CHANGES TO THE IDLING REGULATIONS ARE PROPOSED?	37
H.	WHAT CHANGES TO THE IN-USE OFF-ROAD DIESEL VEHICLE REGULATION ARE PROPOSED?	37
VI.	Regulatory Authority	39
VII.	Emission Impacts	43
A.	WHAT ARE THE EMISSION BENEFITS OF THE REGULATION?	43
B.	DOES THE PROPOSED REGULATION MEET CALIFORNIA'S SIP COMMITMENTS?	45
C.	WHAT EFFECT WOULD THE REGULATION HAVE ON THE HEALTH OF CALIFORNIANS?	46
D.	WHAT IS THE IMPACT OF THE PROPOSED REGULATION ON POTENTIAL CANCER RISK REDUCTION	47
E.	ARE THERE POTENTIAL RISKS ASSOCIATED WITH LOW-USE AND LIMITED USE AGRICULTURAL VEHICLES?	48

F.	WHAT EFFECT WOULD THE REGULATION HAVE ON GLOBAL WARMING AND GREENHOUSE GAS EMISSIONS?	49
VIII.	Costs and Economic Impacts	51
A.	How MUCH WOULD THE PROPOSED REGULATION COST?	51
B.	How MUCH WOULD THE PROPOSED REGULATION COST FLEETS?	51
C.	WHAT WOULD BE THE IMPACT ON AN OWNER/OPERATOR?	52
D.	WHAT WOULD BE THE IMPACT OF THE PROPOSED REGULATION ON SCHOOL DISTRICTS?	52
E.	WHAT WOULD BE THE IMPACT ON GOVERNMENT AGENCIES?	53
F.	How WOULD THE PROPOSED REGULATION AFFECT DIFFERENT CALIFORNIA INDUSTRIES?	53
G.	How SIGNIFICANT WOULD THE PROPOSED REGULATION'S COSTS BE TO FLEETS, AND HOW WOULD FLEETS HANDLE THE COSTS?	55
H.	WHAT ARE THE CUMULATIVE IMPACTS OF THE PROPOSED REGULATION ON BUSINESSES?	56
I.	How WOULD THE PROPOSED REGULATION AFFECT CONSUMERS?	56
J.	How WOULD THE PROPOSED REGULATION IMPACT THE VALUE OF THE EXISTING VEHICLES?	57
K.	WHAT WOULD BE THE STATEWIDE ECONOMIC IMPACT OF THE PROPOSED REGULATION?	57
L.	WHAT WOULD BE THE IMPACT OF THE PROPOSED REGULATION ON EMPLOYMENT?	58
M.	How COST EFFECTIVE WOULD THE PROPOSED REGULATION BE AND HOW DOES THIS COMPARE TO PREVIOUS MEASURES ADOPTED BY ARB?	58
IX.	Availability of Incentive Funding to Comply with the Regulation	61
A.	ARE THERE STATE INCENTIVE FUNDS AVAILABLE TO HELP FLEETS COMPLY WITH THE REGULATION?	61
B.	How WILL THESE FUNDING PROGRAMS CHANGE BECAUSE OF THE PROPOSED REGULATION?	62
C.	How WILL THESE VARIOUS PROGRAM BE INTEGRATED WITH THE PROPOSED REGULATION?	63
D.	WHAT SPECIAL FUNDING IS AVAILABLE FOR UPGRADING AND REPLACING SCHOOL BUSES?	64
X.	Technology Available to Meet Regulatory Requirements	65
A.	WHAT ARE VERIFIED DIESEL EMISSION CONTROL SYSTEMS AND HOW DO WE KNOW THEY REALLY WORK?	65
B.	WHAT EXHAUST RETROFITS WOULD THE REGULATION REQUIRE?	66
C.	WHAT DEVICES HAVE BEEN VERIFIED FOR ON-ROAD VEHICLES?	66
D.	HAVE DIESEL PARTICULATE FILTERS BEEN USED IN ON-ROAD APPLICATIONS?	66
E.	ARE ENGINE REPOWERS REALLY POSSIBLE?	67
F.	ARE NO _x EXHAUST RETROFITS FEASIBLE?	67

XI.	Availability of Devices and Vehicles	69
	A. WOULD ENOUGH EXHAUST RETROFITS BE AVAILABLE TO SATISFY THE REQUIREMENTS OF THE PROPOSED REGULATION?	69
	B. WOULD ENOUGH NEW AND USED VEHICLES BE AVAILABLE TO HELP SATISFY THE REGULATION'S REQUIREMENTS?	69
XII.	Public Outreach	71
	A. WHAT OUTREACH DID STAFF DO TO INFORM THE PUBLIC ABOUT THE REGULATION AND SOLICIT INPUT ON ITS DEVELOPMENT?	71
	B. How DOES THE PROPOSED REGULATION ADDRESS ENVIRONMENTAL JUSTICE CONCERNS?	72
	C. WHAT OUTREACH EFFORTS ARE PLANNED FOR IMPLEMENTATION OF THE REGULATION?	72
XIII.	Implementation and Enforcement	75
	A. How WOULD THE REGULATION BE IMPLEMENTED?	75
	B. How WOULD THE REGULATION BE ENFORCED?	75
	C. WHAT ADDITIONAL RESOURCES ARE NEEDED FOR IMPLEMENTATION AND ENFORCEMENT?	76
XIV.	Alternatives Considered	77
	A. WHAT ALTERNATIVES TO THE REG'ULATION WERE CONSIDERED, AND WHY WERE THEY REJECTED IN FAVOR OF THE PROPOSED REGULATION?	77
XV.	References	81
XVI.	List of Acronyms	83

LIST OF TABLES

Table 11-1:	Statewide Health Impacts of Baseline 2005 Emissions from In Use On-Road Diesel Vehicles Covered by the Regulation	13
Table 11-2:	Localized Non-Cancer Health Impacts Associated with In-Use On-Road Diesel Vehicles Operating in and Around the City of Commerce ¹ - 2003 Emissions	14
Table 11-3:	Exhaust Emission Standards and Phase-In Schedule for 2007 and Later Model Year Heavy-Duty Diesel On-Road Engines	16
Table 11-1:	Vehicles Potentially Affected by the Proposed Regulation, by Fleet Type - 2008	19
Table IV-1:	Best Available Control Technology Compliance Schedule	23
Table IV-2:	Percent of Fleet That Must Comply with PM and NOx BACT Standard.	24
Table IV-3:	Proposed PM BACT Schedule for School Buses	27
Table IV-4:	Agricultural Vehicle Mileage Thresholds	30
Table VII-1:	Statewide NOx Emissions Reductions from the Proposed Regulation	43
Table VII-2:	Statewide PM Emissions Reductions from the Proposed Regulation	44
Table VII-3:	South Coast SIP Emission Reduction Targets for Trucks	46
Table VII-4:	San Joaquin SIP Emission Reduction Targets for Trucks	46
Table VII-5:	Distances from a Facility Boundary in Bakersfield wherein the Risk is 10 in a Million for Different Agricultural Truck Volumes	49
Table VIII-1:	Estimated Regulatory Costs by Business Sector	54
Table VIII-2:	Estimated Regulatory Costs a Percentage of Estimated Revenue (Gross Domestic Product)	55
Table VIII-3:	Comparison of the Average Cost-Effectiveness of the Proposed Regulation to Average Cost Effectiveness of Recently Adopted Air Toxic Control Measures	59
Table IX-1:	Proposed Carl Moyer Program Guidelines Changes	63
Table X-1:	Diesel Emission Control Strategy Verification Levels (as adopted by the Board in January 2008)	65
Table X-2:	Verified Level 3 DECS (as of October 2008)	66
Table XII-1 :	Summary of Outreach Efforts for the Proposed Regulation	71
Table XIV-1:	Alternatives Considered and Why They Were Rejected	77

LIST OF FIGURES

Figure 11-1:	Statewide PM and NOx Emissions Without Regulation	7
Figure 11-2:	Truck and Bus Contribution to Statewide Mobile Source Diesel Particulate Matter and NOx Emissions: 2005	8
Figure 11-3:	Truck and Bus Contribution to Statewide Mobile Source Diesel Particulate Matter and NOx Emissions: 2020, Without Regulation	8
Figure 11-4:	Areas in California that Exceed the Federal and State Annual PM2.5 Standard	9
Figure 11-5:	Areas in California that Exceed the Federal and State 8-Hour Ozone Standard	11
Figure 11-6:	California PM and NOx New Diesel Engine Emissions Standards (Based on Engine Model Year)	16
Figure 111-1:	Percentage of Vehicle Population by Business Sector from National 2002 VIUS* Data	18
Figure 111-2:	Common Types of Over-the-Road Tractors	19
Figure 111-3:	Number of Trucks by Fleet Size (California Department of Motor Vehicles, 2006)	20
Figure IV-1:	Fleet Average Targets	25
Figure IV-2:	Annual Compliance Flowchart	26
Figure IV-3:	ARB Staff Proposed NOx Exempt Areas in California	29
Figure VII-1 :	Projected NOx Emissions With and Without the Regulation	44
Figure VII-2:	Projected PM Emissions With and Without the Regulation	45

APPENDICES

- A. Proposed Regulation to Reduce Emissions from In-Use Diesel Vehicles
 - A1. Summary of Proposed Regulation to Reduce Emissions -Use On-road Diesel Vehicle Regulation
- B. Proposed Amendments to Existing Regulations

I. OVERVIEW AND STAFF RECOMMENDATION

A. Overview

Staff of the Air Resources Board (ARB or Board) is proposing a regulation that would reduce emissions of diesel particulate matter (**PM**) and oxides of nitrogen (**NOx**) from over 400,000 diesel vehicles registered in the State, and another half a million out-of-state trucks that visit California each year. The regulation would achieve these emission reductions by requiring fleet owners to modernize their fleets and install exhaust retrofits. The regulation is projected to achieve significant emission reductions, but at a significant cost to affected fleets.

The scope of the proposed regulation is broad. It would affect about 170,000 California businesses (including over 150,000 small businesses) in most sectors of the State's economy, and almost a million vehicles. Some common industry sectors that operate trucks and buses subject to the regulation include: for-hire transportation, construction, manufacturing; retail and wholesale trade, vehicle leasing and rental, bus lines, and agriculture. Within each of these broad sector categories, there is a wide variety of vehicle types. The potential impact of this regulation on various business sectors depends on the number, type and age of the affected vehicles operated by each sector. A copy of the regulation is provided in Appendix A, and a simplified summary is provided in Appendix A1.

The proposed new regulation would apply to any person, business, school district, school transportation provider, or federal government agency that owns or operates affected vehicles in California. Affected vehicles include heavy-duty diesel-fueled vehicles with a gross vehicle weight rating greater than 14,000 pounds, yard trucks with off-road certified engines and certain diesel-fueled shuttle vehicles regardless of weight. The proposed regulation would be applicable regardless of where the vehicle is registered. However, the proposed regulation would not apply to military tactical support vehicles, authorized emergency vehicles, or private motor homes not used for commercial purposes.

In general, the regulation would require owners to reduce PM and NOx emissions from their fleets by upgrading the vehicles to meet specific performance standards for these pollutants, (defined as best available control technology, or BACT). The BACT standard for PM is generally an engine equipped with a diesel particulate filter, and the BACT standard for NOx is an engine newly manufactured in 2010 or later. A fleet may meet these performance requirements by retrofitting a vehicle with a verified diesel emission control strategy (DECS)¹ that will achieve PM or NOx reductions or both as required, replacing an engine with a newer cleaner one, or replacing a vehicle with one having a cleaner engine. This replacement vehicle can be either new or used.

The proposed regulation begins in 2010, and requires the installation of verified PM DECS on certain vehicles depending on their model year. Then, beginning in 2012,

¹ A retrofit device that has been verified under ARB's Verification Procedure, which ensures the effectiveness and durability of diesel engine retrofits.

fleets would need to begin replacing their vehicles with newer used or new vehicles that meet the most stringent 2010 model year engine emission standards. Through this, by the beginning of 2014, nearly all on-road diesel engines operating in California will either have a verified PM DECS installed, or will be engines that came with a diesel particulate filter from the engine manufacturer. Then, between 2012 and 2022, the remaining older vehicles would need to be replaced such that by 2023, all on-road diesel vehicles operating in California would have the cleanest engines available - that is, they would meet the 2010 model year emission standards.

Each year, the proposed regulation provides three options for complying with the performance requirements. First, a fleet could retrofit and replace vehicles in its fleet, according to a prescriptive schedule, based on each vehicle's engine model year. Second, a fleet could meet a limit that sets an annual cap on the number of retrofits to be installed and the minimum number of engines to be replaced that meet the 2010 engine requirements. Third, a fleet could meet a fleet average option, with targets that decline over time. Each fleet has the flexibility to meet any one of these options each year, and is not required to meet the same option for both pollutants. That is, a fleet could meet the BACT schedule for PM, but meet the fleet average for NOx, and be fully compliant with the proposed regulation.

The proposed regulation also contains special provisions to address the unique issues facing small fleets. Under staff's proposal, small fleets, those with one to three vehicles, are exempt from any clean up requirements until 2012. Then, in 2013, small fleets would need to show they cleaned up one vehicle to a lesser requirement. That vehicle would then not need to meet the 2010 engine requirement until 2018. In fleets of two or three, additional time is then provided for the second or third vehicle to meet the PM and NOx performance requirements.

Because of the wide variety of fleets and vehicles subject to the proposed regulation, certain special provisions have been included. First, the proposed regulation would exempt certain lower use vehicles from some or all of the clean-up requirements. The proposed regulation would establish requirements to clean up diesel PM emissions from school buses, although it would not require the replacement of any school buses newer than 1977. Also, special provisions would be provided for unique vehicles and certain types of agricultural vehicles. The regulation would provide credits for actions which reduce emissions from these vehicles earlier than required, as well as for the early adoption of hybrid vehicle technology and for the use of alternative fuels. Staff is also proposing to address a number of regulatory issues with two-engine cranes and two-engine street sweepers which are subject to a number of different ARB regulations.

To aid in its enforcement, the proposed regulation would impose certain reporting and recordkeeping requirements. The proposed regulation would also establish requirements for any in-state or out-of-state motor carrier, California-based broker, or any **California,**) resident who hires or dispatches vehicles subject to the regulation. Also, California sellers of a vehicle subject to the proposed regulation would have to disclose the regulation's potential applicability to buyers of the vehicles.

The proposed regulation would provide significant diesel PM and NOx emissions reductions that would have a substantial positive air quality impact throughout California. By reducing emissions of pollutants **that** contribute to elevated ambient levels of PM and ozone, the regulation would help achieve attainment of the federal and state clean air standards for PM and ozone. In 2020, the regulation is expected to reduce diesel PM emissions by 5.2 tons per day and NOx emissions by about 79 tons per day statewide, which represents a 43 percent reduction in diesel PM and a 23 percent reduction in NOx from emission levels that would be anticipated in the absence of the regulation. In addition, the proposed regulation would provide a slightly positive change in emissions of greenhouse gases, and would reduce emissions of black carbon - a component of diesel PM and a likely contributor to global warming.

In addition, the proposed regulation is the critical piece in California's efforts to meet federal clean air standards. In 2007, the State approved its blueprint to attain the federal clean air standard for fine particulate (PM2.5) and ozone. This document, known as the State Implementation Plan or SIP, committed to significant emission reductions from trucks operating throughout the **state**, in particular in the South Coast and San Joaquin Valley air basins. The proposed regulation would meet or exceed the combined NOx and PM2.5 SIP fleet rule targets in both the South Coast and San Joaquin Valley air basins for all years. In 2014, in the South Coast Air Basin, the SIP target would be met by achieving slightly **more** PM2.5 reductions and slightly less NOx than expected. The proposed regulation would **also** help achieve the SIP reduction goals in 2020 for attainment in regions downwind of the South Coast and the San Joaquin Valley air basins.

Also, significant additional health benefits would also be obtained with the reductions of ambient levels of diesel PM. The emission reductions from the regulation are expected to prevent approximately 9,400 premature deaths over the course of the regulation (2,800 to 17,000, 95 percent confidence interval), and would result in about 150,000 fewer asthma-related cases and 950,000 fewer lost work days. The economic valuation of these health benefits is estimated to range from \$48 to \$68 billion.

The proposed regulation would not quite achieve the overall goal set forth in the 2000 Diesel Risk Reduction Plan (ARB, 2000) of reducing diesel PM by 85 percent from 2000 baseline levels. However, staff projects that the proposed regulation would reduce in-use on-road vehicle diesel PM emissions from the 2000 baseline by 80 percent in 2020. These reductions represent the maximum achievable reductions of diesel PM emissions from in-use on-road heavy-duty diesel vehicles.

While the benefits of the proposed regulation are significant, so are the costs. Staff estimates that the total cost of the proposed regulation is about \$5.5 billion, in 2008 expenditure equivalent dollars (2008 dollars). Of this, about \$4.5 billion will be incurred by California based fleets, and \$1 billion will be borne by out-of-state fleet operators. These costs will be spread out over 16 years, from 2010 through 2025, with costs varying between years; in its highest year, 2013, the capital costs of the proposed regulation are

expected to be about \$566 million. Overall, about 40 percent of the cost of the proposed regulation is expected to be incurred directly by the transportation and warehousing industry, more than 20 percent by the construction industry, and about 10 percent by the wholesale and retail trade industry. The remaining costs are spread among various other affected industries.

Costs to individual fleets would vary depending on the size of each fleet, vehicle types, vehicle ages, and its normal purchasing practices. Costs also would vary depending on the compliance strategy chosen by each fleet (retrofit, repower, buy new, and/or buy used). For newer fleets, the costs will be minimal, while for older fleets that need to upgrade a significant number of vehicles, the cost will be significantly more substantial. The same holds true for small fleets, where some would experience no increased costs while others would experience higher costs. The total estimated cost over the lifetime of the regulation for small fleets is approximately \$1.7 billion (2008 dollars).

Staff expects many, if not most, affected businesses to pass through the proposed regulation's costs to their customers. This could be achieved, for example, through higher shipping rates, or higher costs for manufactured goods, resulting in higher revenue (but not necessarily higher profits) for affected fleets. However, the ability to pass on costs will vary by business sector. While the overall impact on most business sectors covered by the proposed regulation is small, generally averaging less than one-tenth of one percent of their overall gross domestic product, some companies may not be able to pass through these costs, and will have to absorb them out of their gross revenues. While the extent of the ability for fleets to absorb the costs of the proposed regulation is unclear, this may likely impact the profitability of companies that cannot pass through their compliance costs.

Despite affected fleets passing through these costs, consumers can expect to pay a negligible additional amount for common consumer goods such as food, produce, consumables and other commodities as a result of the proposed regulation.

In considering the ability of fleets to handle the compliance requirements associated with the proposed regulation and other ARB regulations, staff believes this issue is addressed in that ARB's various regulations have different compliance dates, regulatory requirements, and flexibility, which staggers the compliance dates and requirements for various regulations such that any overlap is typically minimal. Also, while many fleets subject to the proposed regulation are also subject to other ARB *regulations*, staff does not believe the cumulative cost impacts of these various regulations will impact affected fleets' ability to comply overall. For example, for construction fleets subject to the proposed *regulation*, the cumulative impact of the proposed regulation and the in-use off-road diesel vehicle regulation is an additional 6 percent over the anticipated costs of that regulation.

While the cost of the proposed regulation is significant, there are also significant amounts of incentive money available for fleets to assist in cleaning up and modernizing their vehicles. In November 2006, California voters approved Proposition 1B, which included

\$1 billion to reduce emissions from the movement of goods throughout the state. ARB has earmarked over \$300 million towards vehicles covered by the proposed regulation, and in particular vehicles operated by small fleets. California's Carl Moyer Program provides \$140 million per year to help reduce emissions from existing diesel engines, and has historically funded a significant number of projects targeting on-road vehicles. Finally, with the approval of Assembly Bill (AB) 118, ARB has been allocated up to \$50 million per year to achieve emission reductions from vehicles and equipment, as well as for research on the air quality impacts of alternative fuels and advanced technology vehicles. In fiscal year 2008/2009, \$48 million has been allocated for the establishment of a heavy-duty vehicle air quality loan program. While these programs, and the dollars they provide, are significant, they are not enough to cover the anticipated costs of the regulation. However, for those that take advantage of them, the combined assistance these programs could provide will be significant. For example, a truck owner/operator could obtain a 2010 model year truck, which would comply with all of the requirements of the proposed regulation, for about less than \$800 per month in loan payments.

Staff has made an enormous effort to notify affected fleets and interested parties about the proposed regulation, and to solicit their input on the proposed regulation. Staff held 54 public workshops and workgroup meetings throughout the state, dozens of site visits and private meetings with fleet owners, vehicle dealers, and industry groups, and sent a mailing to nearly 300,000 owners of registered diesel vehicles in California notifying them of the proposed regulation, how to participate in an online survey, and how to obtain additional information about staffs proposal.

In addition to this Staff Report, staff has also prepared a companion Technical Support Document (TSD) which provides additional information about the proposed regulation.

B. Recommendation

Staff recommends the Board adopt a new section 2025 in Title 13, California Code of Regulations. In addition, staff recommends that the Board approve the proposed amendments to the existing regulations identified Chapter V of this staff report.

The proposed regulation is set forth in the proposed Regulation Order in Appendix A, and a summary of the proposed regulation is provided in Appendix A1. The accompanying amendments to other existing regulations are set forth in the proposed Regulation Order in Appendix B.

II. NEED FOR EMISSION REDUCTIONS

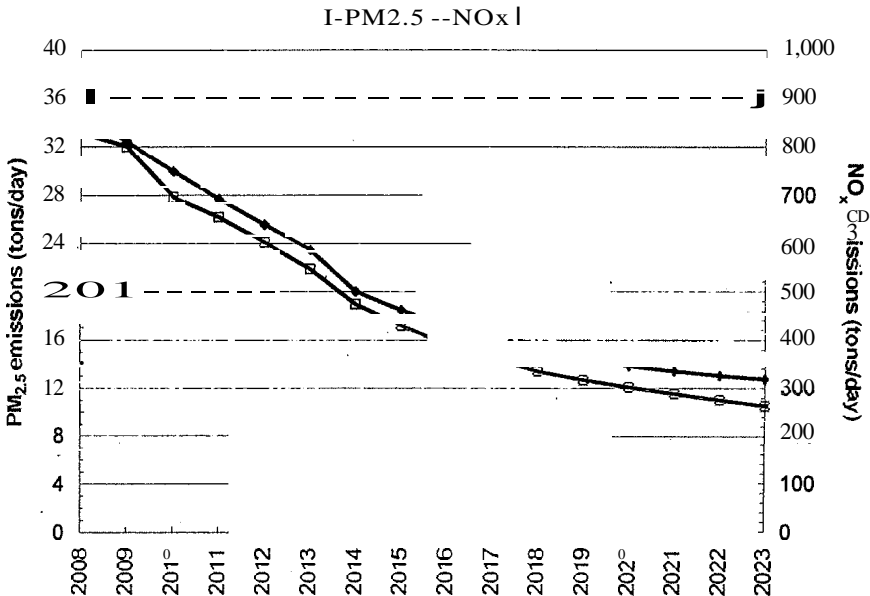
This chapter discusses the need for substantial new reductions in emissions from on-road diesel vehicles subject to the proposed regulation to attain and maintain the state and federal clean air standards, and to reduce the significant health impacts associated with their emissions.

A. How significant are the emissions targeted by the regulation?

On-road diesel vehicles are a significant source of diesel PM and NOx emissions that lead to ozone and ambient PM. Although increasingly stringent new engine standards are reducing emissions from on-road diesel vehicles over time, because of the long useful life of diesel engines, these newer lower emitting engines will be introduced into the state and national fleets relatively slowly. Therefore, in-use on-road diesel vehicles would continue to pose a significant health risk for many years if this proposed regulation is not adopted. Additionally, without reductions from these vehicles, especially in the South Coast and San Joaquin Valley, the state would be unable to attain federal ambient air quality standards.

-If adopted, the proposed regulation is projected to affect almost one million vehicles that operate in California each year. In 2010, these vehicles are estimated to emit approximately 750 tons per day of NOx emissions and nearly 28 tons per day of PM emissions. Figure 11-1 shows the statewide trend in diesel PM and NOx emissions that would be expected beginning in 2010 without the proposed regulation. As can be seen, emissions decrease over time as the older vehicles are replaced with newer, cleaner vehicles. However, unless these reductions are accelerated, they are not enough for many areas of the state to meet clean air standards.

Figure 11-1: Statewide PM and NOx Emissions Without Regulation



Today, trucks and buses subject to the proposed regulation are a significant contributor of NOx and diesel PM emissions in California. As can be seen in Figure 11-2 below, in 2005 these vehicles represent 32 percent of statewide NOx emissions and 39 percent of statewide diesel PM emissions from all mobile diesel engines. In 2020, without the proposed regulation, trucks and buses will still represent 36 percent of the mobile source diesel PM emissions, and 23 percent of mobile source NOx emissions, as shown in Figure 11-3.

Figure 11-2: Truck and Bus Contribution to Statewide Mobile Source Diesel Particulate Matter and NOx Emissions: 2005

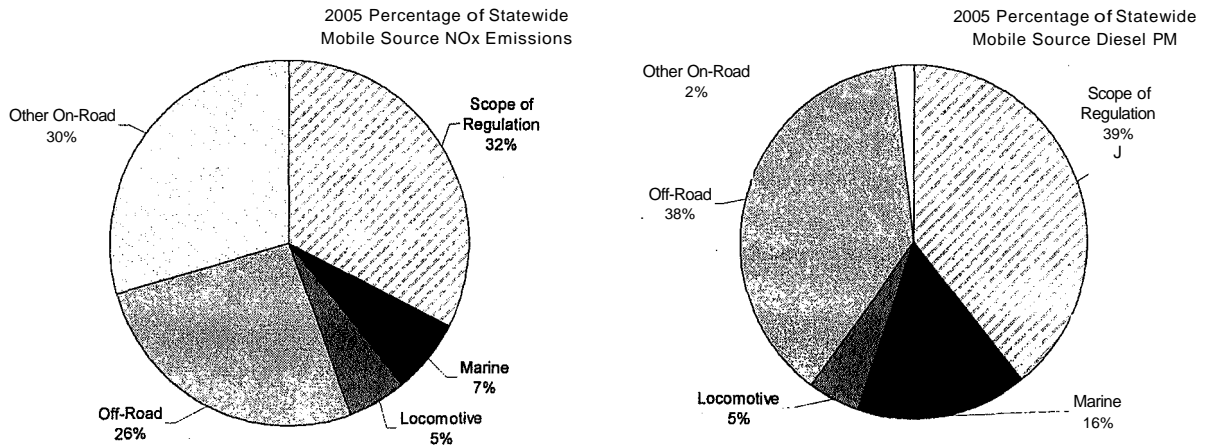
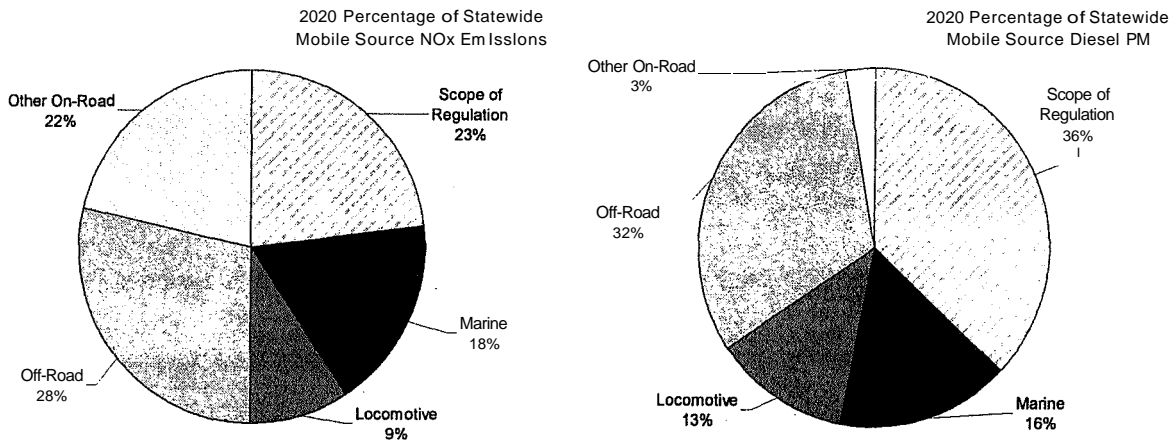


Figure 11-3: Truck and Bus Contribution to Statewide Mobile Source Diesel Particulate Matter and NOx Emissions: 2020, Without Regulation

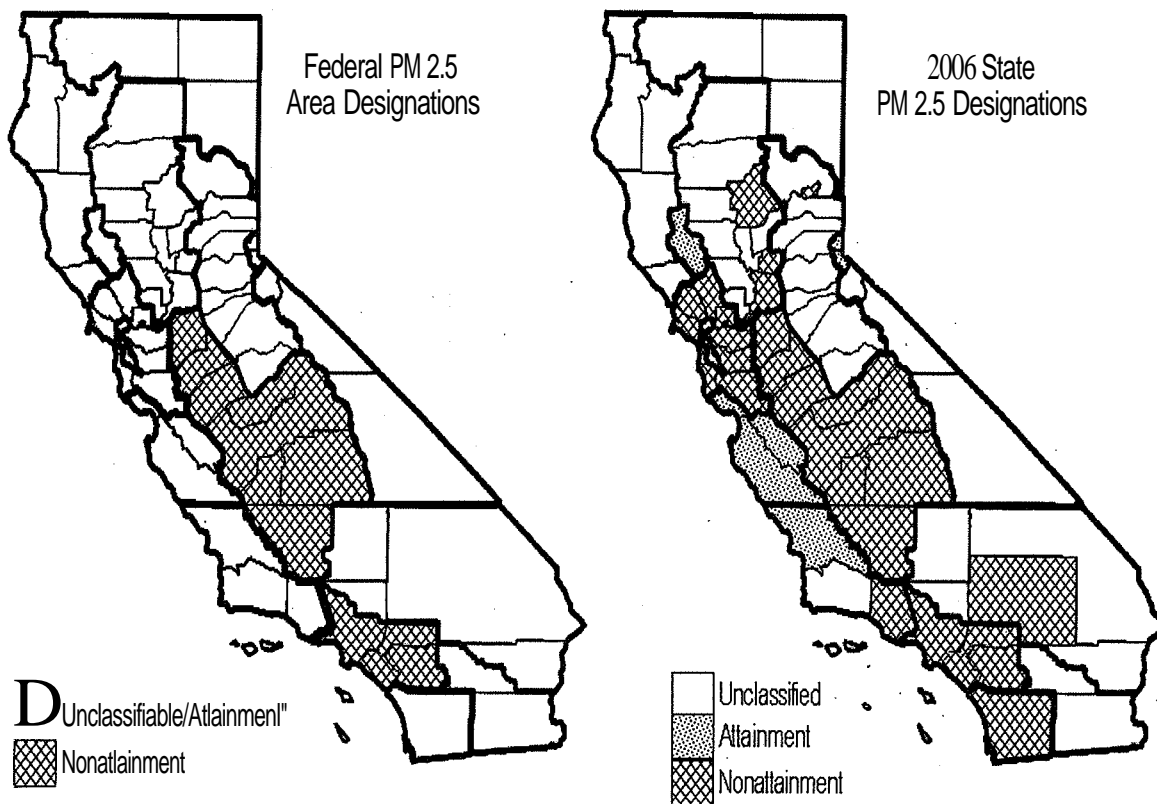


B. Why are reductions of diesel particulate matter emission needed?

In 1998, the Board identified diesel PM as a toxic air contaminant (TAG) and in 2001, adopted the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (Diesel Risk Reduction Plan or diesel RRP). The diesel RRP identified strategies, including air toxic control measures (ATGMs) and regulations, to reduce diesel emissions and associated potential cancer risks from 2000 baseline levels by 75 percent by 2010, and by 85 percent by 2020. DieselPM is a primary contributor to adverse health impacts throughout the state, and a major contributor to ambient risk levels, including an estimated 70 percent of the average cancer risk from all TAGs. The proposed regulation would provide needed progress towards achieving the emission reduction goals of the diesel RRP for on-road vehicles subject to the proposed regulation.

PM emission reductions are also needed because diesel PM contributes to ambient concentrations of fine particulate matter (PM_{2.5}). Ambient PM_{2.5} is associated with premature mortality, aggravation of respiratory and cardiovascular disease, asthma exacerbation, chronic and acute bronchitis and reductions in lung function.

Figure 11-4: Areas in California that Exceed the Federal and State Annual PM_{2.5} Standard



Under the federal Clean Air Act (CAA), the U.S. Environmental Protection Agency (U.S. EPA) has established National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health, including PM_{2.5}. Set to protect public health, the NAAQS are adopted based on a review of health studies by experts and a public process. Areas in the State that exceed the NAAQS are required by federal law to develop State Implementation Plans (SIPs) describing how they would attain the standards by certain deadlines.

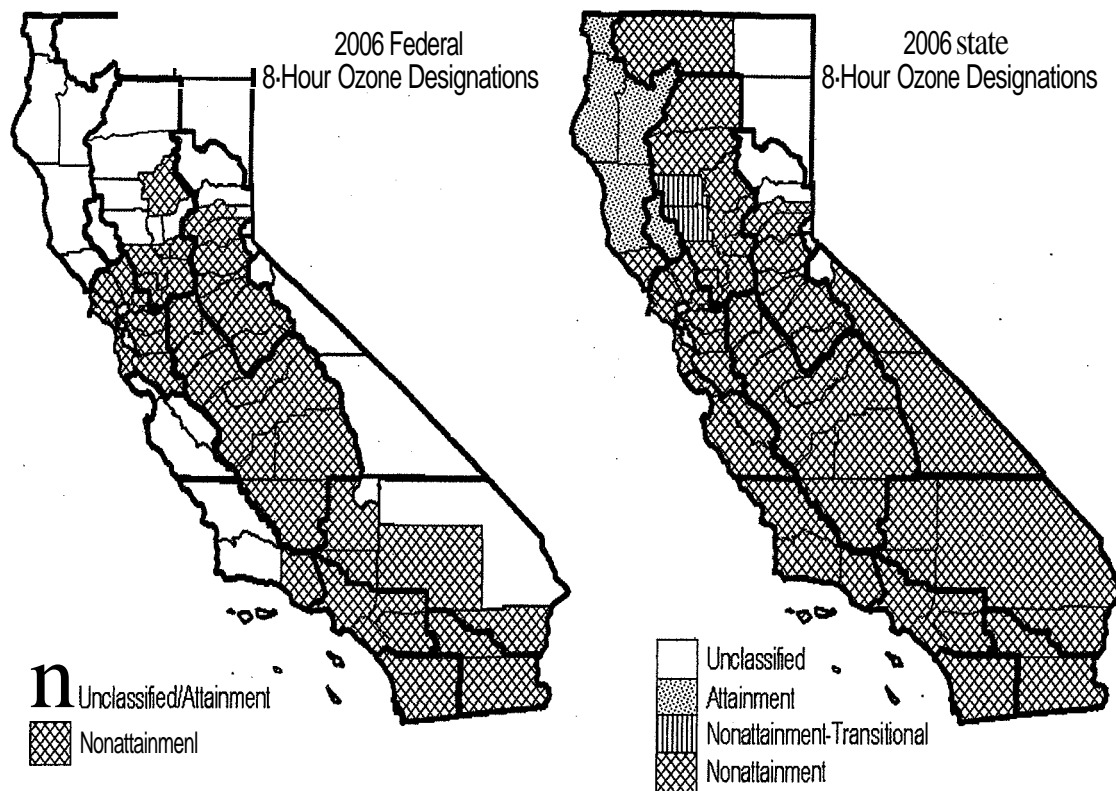
In addition, the state has established its own ambient air quality standards for PM_{2.5}. California's ambient air quality standards for PM_{2.5} are more stringent than the national standards and are intended to provide protection for the most sensitive groups of citizens, including infants and children, the elderly, and persons with heart or lung disease. Figure 11-4 shows the areas of California that exceed the federal and state PM_{2.5} standards.

C. Why are oxides of nitrogen emission reductions needed?

NO_x emission reductions are needed because NO_x leads to formation in the atmosphere of ozone and PM_{2.5}. Scientific studies show that exposure to ozone can result in reduced lung function, increased respiratory symptoms, increased airway hyperreactivity, and increased airway inflammation. Exposure to ozone is also associated with premature death, hospitalization for cardiopulmonary causes, emergency room visits for asthma, and restrictions in activity (ARB, 2005a).

In July 1997, the U.S. EPA promulgated a new 8-hour ozone national standard (replacing the previous federal 1-hour standard) effective September 1997, and in 2004 issued new area designation maps for the new standard. The new standard was set at a lower level to address the cumulative impact of ozone exposure at lower levels for a longer period of time and is more protective of human health. The national 1-hour ozone standard was revoked effective June 15, 2005, for all areas except the 8-hour ozone non-attainment Early Action Compact areas that have deterred effective dates for their designations under the 8-hour ozone standard. California also established an 8-hour standard based on the results of an evaluation of the adequacy of the 1987 standard, as required by the Children's Environmental Health Protection Act (Senate Bill 25, Escutia, 1999). Senate Bill 25 (SB25) directed the ARB, in consultation with the Office of Environmental Health Hazard Assessment (OEHHA), to "review all existing health-based ambient air quality standards to determine whether these standards protect public health, including infants and children, with an adequate margin of safety. Figure 11-5 shows that many areas in the state violate the federal 8-hour ozone standard and most of California violates the state 8-hour ozone standard.

Figure 11-5: Areas in California that Exceeded the Federal and State 8-Hour Ozone Standard



D. What are the State's SIP commitments to reduce emissions from vehicles covered by the proposed **regulation**?

In September 2007, the Board adopted a SIP committing the State to develop measures¹ to achieve emission reductions from sources under State regulatory authority. The reductions are needed to attain the NAAQS for ozone and PM_{2.5}. While multiple areas across the State exceed federal air quality standards, the air quality in the South Coast and the San Joaquin Valley poses the greatest challenge and defines the amount of reductions needed. Reductions are needed by 2014 to meet the PM_{2.5} attainment deadline and by 2023 to meet the ozone attainment deadline. An interim target date of 2017 was adopted by ARB for the San Joaquin Valley to meet the ozone NAAQS as part of an effort to accelerate progress toward attainment before 2023.

The largest share of new emission reductions in the 2007 SIP is expected from trucks. In 2014, reductions from both NO_x and PM_{2.5} are needed to meet the PM_{2.5} standard. In 2023 and 2017, the focus from an ozone air quality standard attainment perspective is NO_x. Therefore, ARB adopted 2014 reduction commitments for both NO_x and PM_{2.5}, and NO_x commitments in 2017, 2020 and 2023. As part of the overall SIP commitment, Staff is also obligated to bring measures to the Board for its consideration. Board

consideration of the proposed regulation is one of these commitments. Staff has used the targeted reductions estimated in the SIP as the goal for this rulemaking.

E. What statewide health impacts are occurring today due to the emissions from vehicles covered by the proposed regulation?

Table 11-1 below summarizes the adverse health impacts occurring in 2008 from on-road diesel vehicles that would be included in the proposed regulation. Staff estimates that in the year 2008, approximately 4,500 premature deaths were associated with the estimated baseline emissions from in-use on-road diesel vehicles subject to the proposed regulation. The health impacts of NO_x as a precursor to ozone are not included in the estimates. Because only a subset of health outcomes was considered, the estimates in Table 11-1 should be considered an underestimate of the total public health impact of diesel PM exposure.

The statewide health impacts from in-use on-road diesel vehicles are significant. To put the magnitude of the health impacts in context, the number of premature deaths estimated for 2008 associated with emissions from in-use on-road diesel vehicles is similar to the number of deaths due to environmental tobacco smoke (secondhand smoke), and to the number of deaths due to motor vehicle accidents. Secondhand smoke is estimated to cause about 4,000 premature deaths per year in California (ARB, 2006), while motor vehicle accidents killed 4,236 people in California in 2006 (NCSA, 2007).

Table 11-1: Statewide Health Impacts of Baseline 2005 Emissions from In Use On-Road Diesel Vehicles Covered by the Regulation² .

Endpoint	Pollutant	Number of Cases (Mean)	Range (95% C.I.)
Premature Mortality	PM	1,100	330 - 2,000
	NOx	3,400	1,000 - 6,000
	Total	4,500	1,400 - 8,000
Hospital admissions (Respiratory)	PM	21	8-35
	NOx	560	320 - 830
	Total	590	330 - 860
Hospital admissions (Cardiovascular)	PM	90	47 -130
	NOx	530	330 -780
	Total	620	380 - 910
Asthma & Lower Respiratory Symptoms	PM	18,000	6,900 - 28,000
	NOx	53,000	21,000 - 83,000
	Total	71,000	28,000 - 110,000
Acute Bronchitis	PM	1,500	0-3,200
	NOx	4,200	0-8,700
	Total	5,700	0-12,000
Work Loss Days	PM	110,000	93,000 -130,000
	NOx	340,000	290,000 - 390,000
	Total	450,000	380,000 – 520,000
Minor Restricted Activity Days	PM	640,000	520,000 - 760,000
	NOx	2,000,000	1,600,000 - 2,300,000
	Total	2,600,000	2,100,000 - 3,100,000

F. What localized health impacts are occurring today due to the emissions from vehicles covered by the proposed regulation?

To evaluate the health impacts from in-use on-road heavy-duty diesel vehicles at a local level, staff performed a localized urban study in and around the city of Commerce (Commerce Study). This study area was a 10 mile by 10 mile region with Commerce as its center.

This study area was selected due to the large number of freeways and major arterials in the area which historically have had high volumes of on-road diesel truck traffic. This area contains a broad mix of land uses including industrial; light industrial; commercial; and residential and about 1.1 million people reside in the study area. The expected concentrations for the vehicle activity are high enough and there is a sufficiently large

² Table includes indirect health impacts from NOx formation of secondary particulate as well as direct health impacts from PM. Table does not include indirect health impacts from NOx formation of ozone.

exposed population to allow quantification of the non-cancer health impacts of direct diesel PM in the urban study area.

Table 11-2 summarizes the estimated adverse health impacts for this area in 2003. Staff estimates that in 2003, approximately 42 premature deaths were associated with exposure to directly emitted diesel PM emissions from in-use on-road diesel vehicles operating in the urban study area. The health impacts of indirect PM (nitrates formed from precursor NOx emissions) and NOx as a precursor to ozone are not included in the estimates. Because only a subset of health outcomes was considered, the estimates in Table 11-2 should be considered an underestimate of the total public health impact in this area from diesel PM exposure.

Table 11-2: Localized Non-Cancer Health Impacts Associated with In-Use On-Road Diesel Vehicles Operating in and Around the City of Commerce - 2003 Emissions "

Endpoint	Number of Cases per Year (Mean)	Number of Cases per Year (Range: 95% Confidence Interval)
Premature Mortality	42	12-72
Hospital admissions (Respiratory and Cardiovascular)	32	13 - 50
Asthma - Related & Lower Respiratory Symptoms	1,400	540 - 2,200
Acute Bronchitis	120	0-260
Work Loss Days	7,400	6,200 - 8,900
Minor Restricted Activity Days	43,000	36,000 - 50,000

¹ The estimated population of the study area is 1.1 million residents.

G. What is the localized potential cancer risk from exposure to diesel **PM** emissions from on-road **diesel** vehicles?

As part of the Commerce Study, staff estimated the localized potential cancer risk in 2003 from exposure in this community to ambient levels of directly emitted diesel PM emitted from on-road diesel trucks that would be subject to the proposed regulation." The results from this analysis provide a quantitative estimate for this community, as well as a qualitative indicator for other similar urban areas.

Potential cancer risk is expressed as chances per million people. The methodology used to estimate the potential cancer risks assumes that an individual "is exposed to an annual

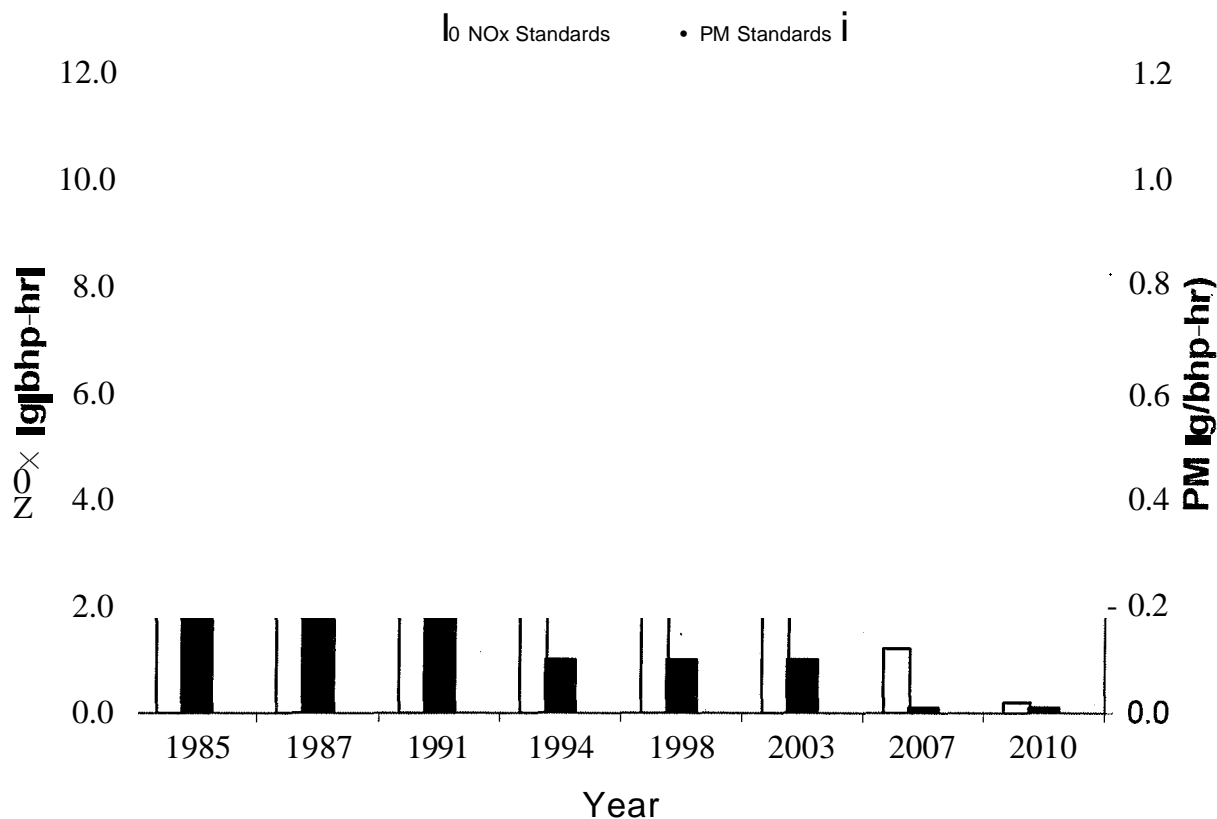
average concentration of a pollutant continuously for 70 years.³ A cancer risk of 10 in a million is the most commonly used threshold above which facilities are required by the Air Toxics Hot Spots Information and Assessment Act to notify all exposed persons (ARB, 2005c). The overall average potential ambient cancer risk within the Commerce Study area is about 375 in a million. This represents nearly a third of the overall potential ambient cancer risk in this community, which was estimated (on a regional basis) to be about 900-1000 in a million for all diesel PM emissions in 2000 (SCAQMD, 2000). By comparison, an estimated cancer risk of 500 in a million occurs at approximately 500 to 5,000 feet from the edges of the major freeways.

H. What new engine emission standards apply to vehicles covered by the proposed regulation?

Emissions from heavy-duty diesel vehicles were first regulated by California in 1969 and later by the U.S. EPA in 1974. However, over the years, California had set its own emission standards apart from U.S. EPA until 1998, when ARB adopted the U.S. EPA's emission standards for 2004 and later model year heavy-duty engines; In January 2001, in light of the advanced development of diesel exhaust aftertreatment technologies, U.S. EPA followed with another rule further lowering emission standards for 2007 and subsequent model year heavy-duty engines; ARB subsequently adopted the same emission standards. The progression of ever increasingly stringent standards for new diesel engines is shown in Figure 11-6 below.

³According to the Office of Environmental Health Hazard Assessment Guidelines, the relatively health-protective assumptions incorporated into the Tier-1 risk assessment make it unlikely that the risks are underestimated for the general population..

Figure 11-6: California PM and NOx New Diesel Engine Emissions Standards (Based on Engine Model Year)



The 2007 model year engine standards reduce exhaust emissions from new diesel engines by 90 percent for NOx, 72 percent for non-methane hydrocarbons (NMHC), and 90 percent for PM from 2004 levels. The requirements to meet the NOx and NMHC emission standards are phased in from 2007 to 2010. The phase in schedule shown in Table 11-3 represents the percentage of new engines produced for sale in California that are required to meet the more stringent emission standards beginning in 2007. Full implementation is required starting with the 2010 model year.

Table 11-3: Exhaust Emission Standards and Phase-In Schedule for 2007 and Later Model Year Heavy-Duty Diesel On-Road Engines

Pollutant	Standard (g/bhp-hr)	Phase in by Model Year (percent of sales)			
		2007	2008	2009	2010
NOx	0.20	50%	50%	50%	100%
NMHC	0.14	50%	50%	50%	100%
PM	0.01	100%	100%	100%	100%

III. AFFECTED INDUSTRIES AND VEHICLES

This chapter presents an overview of the types of businesses and vehicles that would be affected by the proposed regulation.

A. What industries and types of fleets will be affected by the proposed regulation

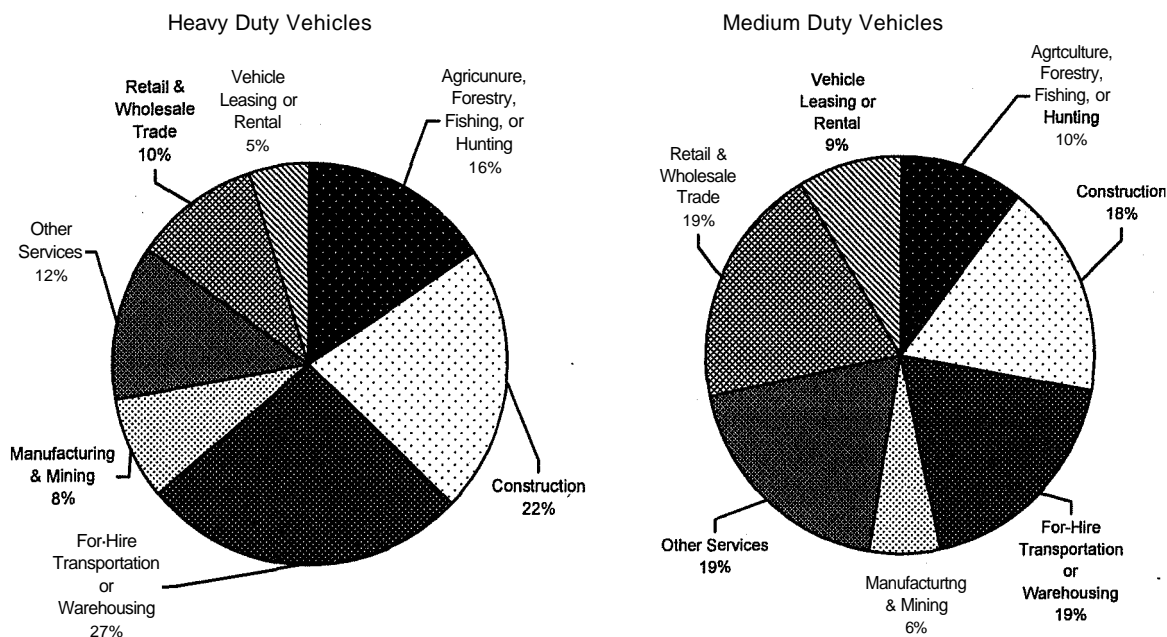
The use of on-road heavy-duty diesel vehicles is ubiquitous through the state. Nearly all sectors of the economy use on-road diesel vehicles that will be subject to the proposed regulation in one way or another. All told, approximately 170,000 businesses in California, and almost a million vehicles that operate on California roads each year, will be affected.

Some common industry sectors that operate vehicles subject to the regulation include:

- For-hire transportation
- Construction
- Manufacturing
- Retail and wholesale trade
- Vehicle leasing and rental
- Federal government and Tribal reservations
- Bus lines, and
- Agriculture, forestry and fishing

The California industries most affected by the proposed regulation are those that use significant numbers of heavy-duty trucks. While California specific data is not available, Figure 111-1 provides national data showing the percentage of medium-duty and heavy-duty vehicles in various industry sectors which would be subject to the proposed regulation.

Figure 111-1: Percentage of Vehicle Population .by Business Sector from National 2002 VIUS* Data



*Vehicle Information and Use Survey

As can be seen in Figure 111-1, overall, the for-hire transportation industry sector is the largest sector that would be affected by the proposed regulation. This industry provides over-the-road transportation of cargo using medium-duty and heavy-duty vehicles, such as trucks and tractor trailers.

B. How many and what types of vehicles are subject to the regulation?

The proposed regulation would affect nearly one million vehicles operating in California each-year. Among these vehicles, there are thousands of vehicle types that will be subject to the proposed regulation. They include over-the-road tractors, dump trucks, buses, street sweepers, cranes, fuel delivery trucks, and many others. Also included are buses, school buses (both private and public), as well as motor coaches and shuttle buses. In general, vehicles are classified as medium heavy-duty (MHO) if their gross vehicle weight rating (GVWR) is less than 33,000 pounds, and as heavy heavy-duty (HHO) if their GVWR is greater than 33,000 pounds. The GVWR is the weight of the vehicle and the payload it can haul.

The most common type of vehicle is as an over-the-road tractor. Tractors typically have either a single or dual rear axles. A single drive axle tractor is often used to pull shorter trailers or lighter loads and is easier to maneuver. A dual (tandem) axle tractor is commonly used in long haul operations and for transporting heavier loads, and often is equipped with a sleeper berth. Figure 111-2 below shows both kinds of common over-the-road tractors.

Figure 111-2: Common Types of Over-the-Road Tractors

Tandem **Axle** Tractor with Sleeper

Single Axle Tractor

Most vehicles can be broadly categorized by whether they operate on an in-state or interstate basis, and by their weight. Interstate vehicles are typically heavy heavy-duty vehicles, and can be registered either in California or through the International Registration Program (IRP). In-state vehicles include both medium and heavy heavy-duty vehicles that are registered to operate exclusively in California (except for some agricultural vehicles which don't leave a farm and are not registered to be driven on-road).

Table 111-1 below shows the number and types of vehicles that would be subject to the proposed regulation. As can be seen, there are almost 400,000 in-state vehicles, and just over 550,000 interstate vehicles that operate in California each year. Less than 5 percent of these vehicles are motor coaches and school buses.

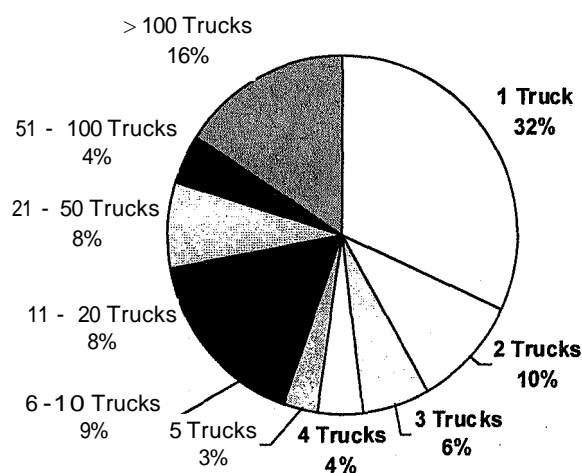
Table 111-1: Vehicles Potentially Affected by the Proposed Regulation; by Fleet Type - 2008

Fleet/Population Type	Number of Vehicles	Percent of Vehicles
<i>Instate Total</i>	379,168	40%
Instate MHO	210,760	22%
Instate HHO	141,964	15%
Motor Coach & School buses	26,443	3%
<i>Interstate Total</i>	561,499	60%
Interstate MHO	8,896	1%
Interstate HHO (CA Registered)	60,263	6%
Interstate HHO (non-CA Registered)	492,340	52%
<i>Total</i>	940,667	100%

C. How many vehicles are owned by small fleets?

Out of the nearly 170,000 California-based fleets that would be subject to the proposed regulation, nearly 90 percent, or 156,000, are small fleets. A small fleet is defined in the proposed regulation as a fleet that owns or operates three or fewer vehicles; these fleets range from small companies having just a few vehicles to truck owner/operators. All told, over 190,000 vehicles (representing nearly 50 percent of the in-state vehicles) are owned by small fleets. The number of California registered vehicles, by fleet size, is shown below in Figure 111-3.

Figure 111-3: Number of Trucks by Fleet Size (California Department of Motor Vehicles, 2006)



IV. DESCRIPTION OF PROPOSED REGULATION

The major requirements of the proposed regulation are summarized in this chapter. It provides basic information on who must comply with the proposed regulation, the types of vehicles affected, and the major compliance requirements. The language of the proposed regulation is provided in Appendix A, and a summary is provided in Appendix A1. A more detailed plain English summary of the proposal is available in the TSD.

A. Who must comply with the proposed regulation?

The proposed regulation would apply to any person, business, school district, or federal government agency that owns, operates, leases or rents affected vehicles in California. The proposed regulation would also establish requirements for any in-state or out-of-state motor carrier, California-based broker, or any California resident who hires or dispatches vehicles subject to the regulation. California sellers of a vehicle subject to the proposed regulation would have to disclose the regulation's potential applicability to buyers of the vehicles.

B. What vehicles are affected by the proposed regulation?

Affected vehicles include heavy-duty diesel fueled vehicles with a GVWR greater than 14,000 pounds, yard trucks with off-road certified engines, and diesel fueled shuttle vehicles of any GVWR that have a capacity of 10 or more passengers and routinely drive an average of 10 trips per day to or from airport terminals, marine terminals, and rail based stations. Drayage trucks and utility owned vehicles would be subject to the regulation beginning January 1, 2021.

C. Does the regulation apply to out-of-state companies?

The proposed regulation would apply to any vehicle operating in California, regardless of where the vehicle is registered.

D. What vehicles are not subject to the proposed regulation?

The proposed regulation would not apply to military tactical support vehicles, authorized emergency vehicles, private motor homes not used for commercial purposes, dedicated snow removal vehicles, and historic vehicles. The regulation would also not apply to the following vehicles:

- Vehicles subject to the regulation for solid waste collection vehicles;
- Public agency and utility owned vehicles, except that vehicles owned or operated by a private utility would become subject to the regulation on January 1, 2021;
- Transit urban bus fleets;
- Transit fleet vehicles;
- Vehicles subject to the regulation for mobile cargo handling equipment at ports and intermodal rail yards;

- Off-road vehicles subject to title 13, California Code of Regulations (CCR), sections 2401,2421,2411,2432, and 2449; and
- Two-engine cranes, as defined in title 13, CCR, section 2449(c)(56).

E. What would the proposed regulation require?

In general, the regulation would require owners to reduce PM and NOx emissions in their fleet by upgrading existing vehicles to meet best available control technology (BACT) standards for PM and NOx. A fleet may meet these performance requirements by retrofitting a vehicle with a verified diesel emission control strategy (DECS)⁴ that will achieve PM or NOx reductions or both as required, replacing an engine with a newer cleaner one, or replacing a vehicle with one having a cleaner engine.

The regulation provides three options for complying with the performance requirements. They are: the BACT compliance option, the BACT percentage limits option, and the fleet averaging option. Once a fleet meets anyone of these compliance options for NOx and PM, they have met the performance requirements for that year. In addition, the proposed regulation allows fleets to meet the NOx and PM performance requirements separately, using different compliance options for each pollutant. For example, a fleet may choose to meet the fleet average option for NOx, and separately comply with the BACT percent limit for PM.

The BACT standard for PM is an engine equipped with the highest level verified DECS for PM or an engine originally equipped with a diesel particulate filter by the engine manufacturer. The BACT standard for NOx is an engine newly manufactured in 2010 or later or a 2010 emissions equivalent engine. The regulation defines a 2010 equivalent engine based on the model year of the older engine and the emissions reduction that would be required to make the older engine equivalent to a 2010 model year engine.

F. What is required by the BACT compliance option?

Using this option, a fleet would be required to comply with a prescribed BACT schedule (Table IV-1) that would determine, based on the vehicle's engine model year, which engines would be required to have the highest level verified DECS and which would be required to be replaced.

For fleets using this compliance option, starting January 1, 2011, any vehicle with a model year engine older than 1994 would have to meet the PM BACT requirements. This requirement would expand in subsequent years to ensure that, by January 1, 2014, all vehicles have a verified DECS or an engine originally equipped with a diesel particulate filter by the engine manufacturer. The proposed regulation would also require owners to reduce NOx emissions from the fleet by accelerating vehicle replacement

⁴ A retrofit device that has been verified under ARB's Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines, title 13, CCR, sections 2700 et seq. .

beginning in 2013; so that by 2023, all engines would be manufactured in 2010 or later, or be retrofitted to achieve equivalent emission reductions.

Table IV-1: Best Available Control Technology Compliance Schedule

Compliance Deadline, Jan 1	Engine Model-Years	BACT Requirements
2011	Pre-1994	PM BACT
2012	2003 -2004	PM BACT
2013	2005 - 2006	PM BACT
	1994 -1999	NOx and PM BACT
2014	2000 -2002	NOx and PM BACT
	All other model years	PM BACT
2015	Pre-1994	NOx and PM BACT
2016	2003 - 2004	NOx and PM BACT
2017	2005 - 2006	NOx and PM BACT
2018	All pre-2007	No new requirements
2019	All pre-2007	No new requirements
2020	All pre-2007	No new requirements
2021	2007 or equivalent	NOx and PM BACT
2022	2008	NOx and PM BACT
2023	2009	NOx and PM BACT

G. What is required by the BACT percent limit option?

This option specifies the minimum number engines each year that must have the highest level verified DECS to meet the PM performance requirements regardless of engine model year, and the minimum number of engines required to meet the 2010 engine requirements to satisfy the NOx performance requirements. Engines originally equipped with a diesel particulate filter by the manufacturer would count towards the number of verified DECS. The requirements of this option are shown in Table IV-2 below.

This option would allow a fleet to decide the order in which the vehicles will be retrofit and replaced, regardless of their age. This would provide additional flexibility to fleets such that they may be able to keep older, more expensive or specialized vehicles in their fleet longer than would be allowed under the BACT schedule, so long as they replace and/or retrofit a certain number of other vehicles first.

Table IV-2: Percent of Fleet That Must Comply with PM and NOx BACT Standard

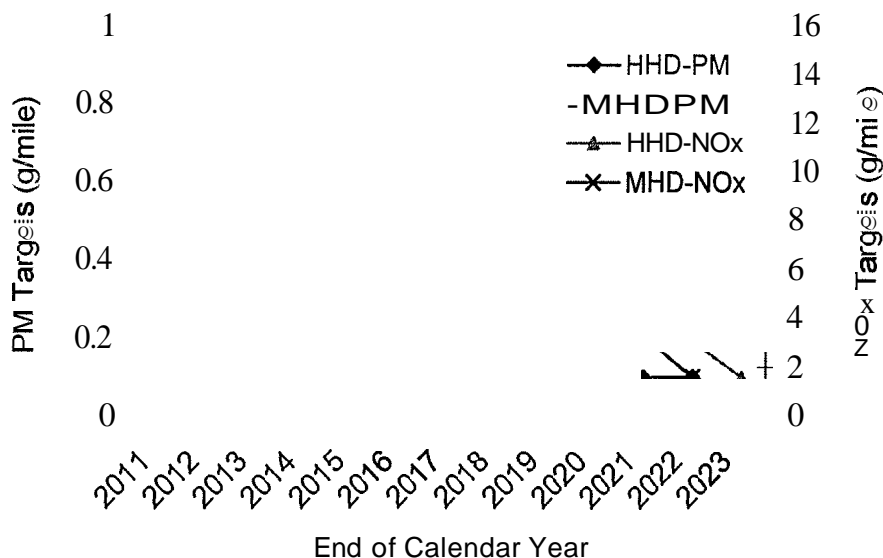
Compliance Deadline as of January 1	Percent of Total Fleet Complying with BACT	
	PM BACT-	NOxBACT
2011	25%	N/A
2012	50%	N/A
2013	75%	25%
2014	100%	50%
2015	100%	50%
2016	100%	60%
2017	100%	80%
2018	100%	80%
2019	100%	80%
2020	100%	90%
2021	100%	90%
2022	100%	90%
2023	100%	100%

H. What is required by the fleet averaging option?

The owner would use PM and NOx emission factors established by the regulation to calculate the average emissions of the fleet. By the applicable compliance date each year, the owner would have to demonstrate that the fleet average emissions for PM and NOx did not exceed the PM and NOx fleet average emission rate targets set by the regulation. The targets would decline over time, requiring fleets to reduce their emissions further as time goes on. The proposed fleet average targets for PM and NOx are shown below, in Figure IV-1, for medium-heavy duty and heavy-heavy duty vehicles.

This option would allow a fleet to select the order of vehicles that will be retrofit and replaced, considering their relative emissions. This would provide additional flexibility to fleets such that they may be able to keep older, more expensive or specialized vehicles in their fleet longer than would be allowed under the BACT schedule, so long as they also have cleaner vehicles in their fleet. Staff has developed a fleet calculator to assist fleet owners simplify the fleet averaging calculation.

Figure IV-1: Fleet Average Targets



I. Are there provisions for small fleets?

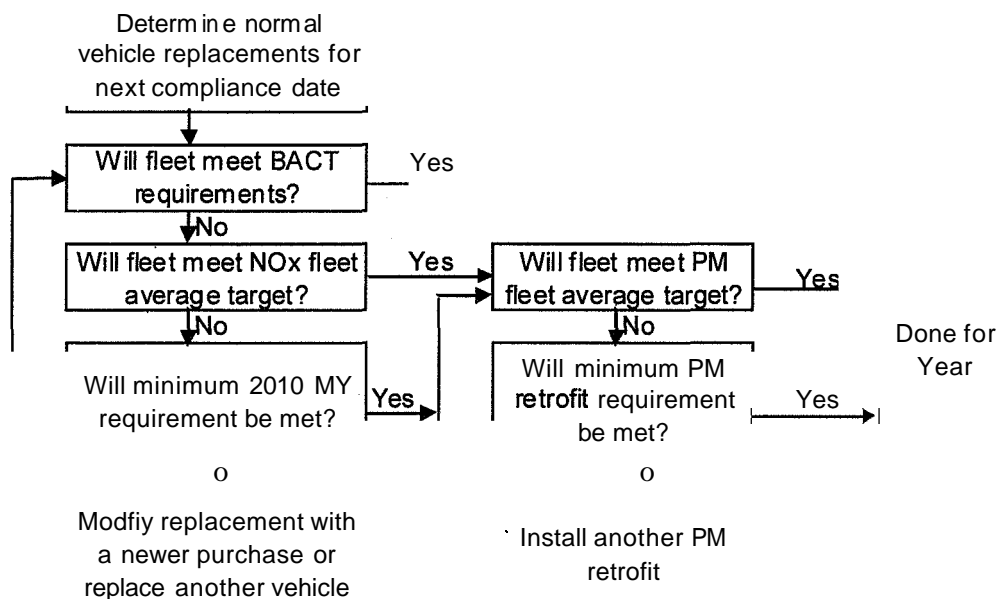
Yes. Fleets with three or fewer vehicles would be exempt from all clean-up requirements through 2012. Then, by January 1, 2013, a small fleet would need to show that it has at least one vehicle equipped with a 2004 model year or newer engine having a verified PM DECS. By January 1, 2018, that vehicle would need to meet the proposed PM and NOx performance requirements of the regulation. For fleets of just a single vehicle, these are the only performance requirements that must be met. For fleets with two vehicles, the second vehicle would be required to meet the PM and NOx performance requirements by January 1, 2014.

For fleets of three vehicles, two compliance paths are available. After having shown that it equipped its first vehicle with a 2004 model year or newer engine having a PM exhaust retrofit, a fleet of three vehicles could comply by having its two remaining vehicles meet the PM and NOx performance requirements by January 1, 2014, or electing to have the second vehicle meet the 2010 engine emissions requirements by January 1, 2014, and the third vehicle meet the PM and NOx performance requirements by January 1, 2016.

J. What would the regulation actually require fleets to do?

Because of the unique nature of each fleet, the proposed regulation would mean different things to different fleets. For newer fleets, the regulation may not require any actions, as their normal business model is to purchase new vehicles and keep them for only a few years until they are sold and replaced. However, for older fleets, the proposed regulation would require that they retrofit certain vehicles in 2010 and 2011, and begin to replace vehicles or engines beginning in 2012. For fleets that do not meet the NOx and PM performance requirements of the proposed regulation, Figure IV-2 provides a graphical depiction of the compliance process.

Figure IV-2: Annual Compliance Flowchart



Each year, the fleet owner would first determine whether the fleet will meet the BACT requirements. If the fleet meets the requirements, then there is no need to take any further action that year. However, if the fleet won't meet the BACT requirements, then, the owner would take several steps to meet the NOx and PM performance requirements.

First, the fleet owner would check whether the fleet will meet the NOx fleet average target. If the owner does not meet the NOx fleet average, the fleet owner would check to see if the NOx BACT percent limit is satisfied. If none of the NOx performance requirements are met, the fleet owner must begin replacing vehicles with newer vehicles until one the NOx requirements is satisfied.

Once an owner has met one of the NOx performance requirements, then the fleet owner would check as to whether the fleet would meet one of the PM compliance options - either the PM BACT percent limit or the PM fleet average target. Once one of these Requirements is satisfied, then the fleet is compliance for the year. Otherwise, the fleet owner would need to plan to install verified PM DECS as necessary for compliance for that year.

K. What are the requirements for school buses?

Unlike the **other** vehicle sectors subject to the NO_x and PM performance requirements, school buses would only be required to meet the proposed PM requirements, and would be subject to several special provisions and timetables specifically designed for school buses.

School buses manufactured prior to April 1, 1977, before minimum federal safety standards were established, will be required to be removed from service by January 1, 2012. All remaining diesel-fueled school buses may meet one of the three proposed compliance options. To address the unique nature of school buses and school districts, a different BACT Compliance Schedule has been proposed, as shown in Table IV-3

Table IV-3: Proposed PM BACT Schedule for School Buses

Compliance Deadline as of January 1	Engine Model Year
2011	2000 and newer
2012	1994 - 1999
2013	1987 - 1993
2014	Pre - 1997

School buses would be considered in compliance with the proposed regulation when they have installed the highest level verified DECS available for the school bus engine. If it is not technologically feasible for the school bus engine to be retrofitted with a highest level verified DECS, then compliance with the PM performance requirements of the regulation may be delayed until January 1, 2018. However, by this date, either the school bus engine needs to be replaced with an engine that is in compliance with the proposed regulation (that is, can be retrofit or already has highest level verified DECS installed) or the school bus needs to be replaced.

Engines equipped with a diesel particulate filter by the engine manufacturer as original equipment are considered in compliance with the requirement. School buses registered as historic vehicles or designated as low-use vehicles are exempted from the PM performance requirements.

L. What are the requirements for drayage trucks?

Drayage trucks are vehicles over 33,000 pounds GVWR that pick-up or deliver containers, bulk, and break-bulk goods to and from ports and intermodal rail yards. These trucks are currently regulated under the in-use on-road diesel-fueled heavy-duty drayage truck regulation. Staff is proposing that drayage trucks with 2004 model year engines would need to be equipped with the highest level verified DECS for PM by January 1, 2012, and drayage trucks with 2005 - 2006 model year engines would need to be equipped with the highest level verified DECS for PM January 1, 2013. This requirement would align the drayage truck rule with the proposed regulation. In addition, the proposed regulation would require that **all** drayage trucks comply with the PM and

NOx performance requirements of the proposed regulation starting January 1, 2021. Similar provisions would also be added to the drayage truck regulation.

M. **Does** the regulation provide any special credits?

The proposed regulation would provide credit for early compliance action. If an owner installs the highest level verified DECS for PM by January 1, 2010, compliance with the NOx requirement of the regulation may be delayed for 4 years (until January 1, 2014).

The proposed regulation also provides credit towards compliance with the proposed fleet average requirements for using hybrid vehicles where that the fuel economy of the hybrid vehicle is at least 20 percent better than an equivalent vehicle. The credit would expire January 1, 2018. The regulation also gives towards compliance with the fleet average to fleets using vehicles equipped with alternative fuel or heavy-duty pilot ignition engines.

N. Are there special provisions for low-use vehicles?

A vehicle would be exempt from both the PM and NOx cleanup requirements if the propulsion engine was operated in California for fewer than 1,000 miles and less than 100 hours during the preceding year. Such vehicles must have a properly functioning odometer and hour meter installed at all times.

O. Are there special provisions for vehicles used for emergency operation?

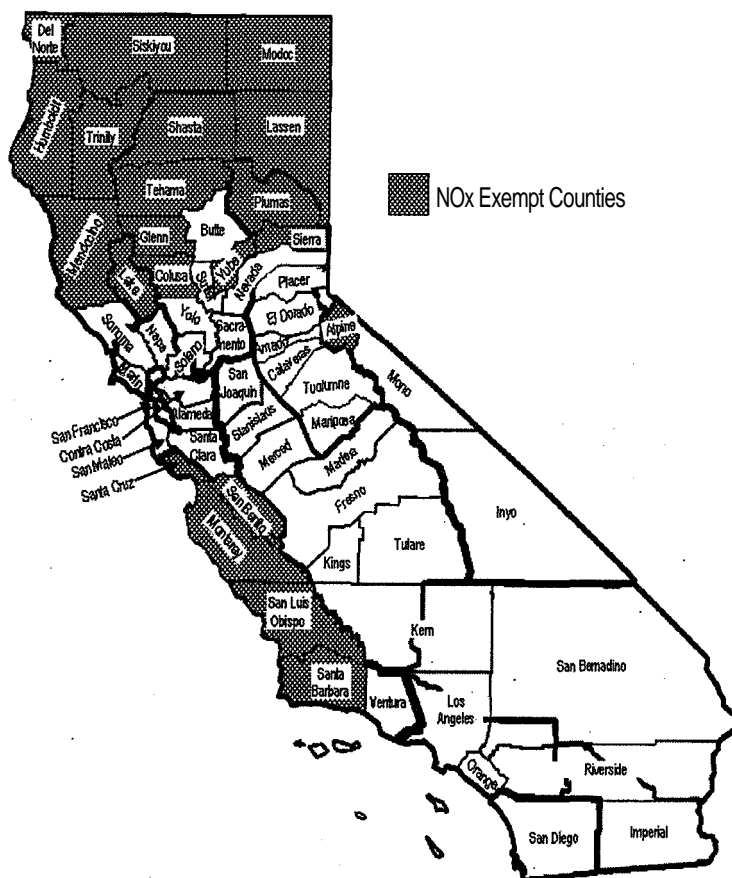
Vehicles used solely for emergency operations would be exempt from the NOx and PM performance requirements. For vehicles used both for emergency operations and for other purposes, hours of operation accrued when the vehicle is used for emergency operations would not need to be included when determining low-use status. However, the owner must keep records documenting dispatch by a governmental emergency management agency for travel to and from an emergency event.

P. Would an owner have **to** replace a vehicle that is operated in less polluted areas of the state?

Fleets that operate exclusively in counties that attain all the NAAQS and that do not contribute to downwind violations of the federal ozone **standard** would be exempt, until January 1, 2021, from the NOx requirements of the proposed regulation. The counties are Alpine, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Monterey, Plumas, San Benito, San Luis Obispo, Santa Cruz, Shasta, Sierra, Siskiyou, Trinity, Tehama, and Yuba. These NOx-exempt areas are shown in Figure IV-3.

Fleets that operate in these areas **would** still have to meet the PM performance requirements. They would also be subject to the reporting requirements, and would have to comply with the electronic tracking system requirements.

Figure IV-3: ARB Staff Proposed NOx Exempt Areas in California



Q. How does the regulation apply to rental and lease companies?

The proposed regulation would treat rental and lease companies just like any other fleet. In other words, the rental vehicles are the responsibility of the rental company rather than the user. However, for vehicles leased for a period of a year or more, if a rental or leasing company and the lessee agree in the lease agreement that the vehicle will be the responsibility of the lessee, it may be excluded from the rental or leasing company's fleet that year and **included** in the fleet of the lessee. If rental and leasing companies are selling vehicles which were formerly part of their rental fleet and the rental vehicle was operated less than 1,000 miles and 100 hours during the past year, such vehicles may be treated like other vehicles being held for sale, as described in more detail below.

Also, vehicles under a long-term lease of a period of a year or more that was in place before the regulation takes effect would be the responsibility of the lessee rather than the leasing company.

R. What are the special provisions for agricultural vehicles?

The proposed agricultural vehicle provisions provide additional time, up to specified dates, for certain vehicles used in agricultural operations to be cleaned up. However, by

January 1, 2023, all agricultural vehicles must meet the 2010 model year engine emissions requirements.

Agricultural vehicles that operate below specified mileage thresholds would be exempt from the proposed PM and NOx performance requirements until the dates shown in Table IV-4. Such vehicles are defined as either Low-Mileage or Limited-Mileage Agricultural vehicles, based on their annual mileage. The proposed regulation limits the number of these vehicles that may utilize this provision; this means that agricultural vehicles newly added to a fleet cannot take advantage of this provision, and would have to meet the same requirements as any other vehicle subject to the proposed regulation. Also, vehicles that operate above these thresholds would have to meet the same requirements as any other vehicle subject to the proposed regulation.

Table IV-4: Agricultural Vehicle Mileage Thresholds

Type of Exempt Vehicle	Model Year Engine	Mileage Threshold (Less Than)	Expiration Date of January 1
Low-Mileage Ag	Any	10,000	2023
	1995 and older	15,000	
Limited-Mileage Ag	1996 to 2005	20,000	2017
	2006 and newer	25,000	

In addition, a certain limited number of additional vehicles qualifying as specialty agricultural vehicles would be exempt from the PM and NOx performance requirements until January 1, 2023. Specialty agricultural vehicles include a specific subset of agricultural vehicles, including nurse rigs, cotton module trucks, feed trucks used by cattle and calf feed lots, and water trucks owned and operated by farmers for dust control and irrigation. However, under these provisions, the number of specialty agricultural vehicles operating in the San Joaquin Valley cannot exceed 1,100 trucks, and the total number operating statewide cannot exceed 2,200, as reported to the ARB. Once these thresholds are reached, vehicles that would otherwise meet the definition of specialty vehicle are not eligible to be considered as specialty agricultural vehicles, and would have to meet the other provisions of the proposed regulation.

S. Are there any other special provisions?

The proposed regulation would delay the vehicle NOx performance requirements for certain vehicles operated below certain mileage thresholds (that is, they would not need to be replaced); however, these vehicles would remain subject to the PM requirements. For truck tractors and vehicles with a GVWR greater than 33,000 lbs, the mileage threshold would be 7,500 miles per year. Such vehicles that use power take off to perform work while stationary and yard trucks must also demonstrate they operate less than 250 hours per year. All other vehicles would be eligible for the delay if operated less than 5,000 miles per year. Such vehicles that use power take off to perform work while stationary must also operate less than 175 hours per year. This delay would expire on January 1, 2021.

Unique vehicles, such as certain single engine, twin-steer, triple-frame cranes, would not be subject to the NOx performance requirements until January 1, 2021, provided all other vehicles in the fleet operator's fleet meet the BACT performance requirements. However, these unique vehicles would remain subject to the PM performance requirements. The proposed regulation provides specific requirements **that** must be demonstrated for a unique vehicle to be eligible for a delay in NOx performance requirements. These requirements are:

- demonstrating that a cleaner used vehicle (having a 2007 and later model year engine) is not available; and
- a suitable cab and chassis upon which the truck body could be mounted is not available, and
- demonstrating that the vehicle cannot be retrofit with a verified NOx DECS, and;
- **installing** the highest level verified PM DECS.

Cab-over engine truck tractors that exclusively pull 57 foot trailers would also be eligible to delay the NOx performance requirements until January 1, 2018, provided the engine is a 2004 model year engine and the highest level verified PM DECS is installed. All other vehicles in the fleet would need to meet the BACT performance requirements.

T. How does the regulation apply to sellers and dealers of vehicles

The requirement for sellers applies to sellers such as vehicle dealers and auction houses or financing companies who do not operate the vehicles. Their only obligation is to disclose to the buyer that the buyer may be subject to the proposed regulation.

Vehicles that are temporarily owned by dealerships or are incidentally owned by financing companies and are awaiting sale would not be subject to the recordkeeping, reporting, or performance requirements of the regulation provided the vehicles are not being operated (other than operation for sales demonstration or maintenance). Thus, dealers and financing companies that do not operate vehicles and that do not offer them for rent would not need to report their vehicles and need not comply with any performance requirements of the regulation. Dealers that hold vehicles for sale and also rent them out or lease them would be responsible for compliance as previously described for rental and lease companies.

U. What are the special provisions for two-engine sweepers?

The auxiliary engine of a private two-engine sweeper would be removed from the requirements of the portable engine ATCM and would be treated the same as the propulsion engine of any other vehicle subject to the proposed regulation. In doing so, the auxiliary engine in these vehicles would be required to meet the PM performance requirements on the same schedule as the propulsion engine.

However, to provide more time for certain sweepers that are used **infrequently** to be cleaned up, private two-engine sweepers that have an uncertified Tier 0 off-road auxiliary

engine would not be allowed to operate more than 250 hours per year until January 1, 2014, and up to 100 hours per year thereafter.

V. What if retrofits are not available? ;

If a vehicle (including school buses) cannot be equipped with the highest level verified PM DECS, the fleet owner may request a one-year extension of the compliance deadline for the PM BACT requirement. The fleet owner would have to apply to the Executive Officer for an extension each year that the retrofit is unavailable from January 1, 2011, through January 1, 2017, or until the vehicle must meet the NOx performance requirements. Provided all other vehicles in the fleet are in compliance with the PM BACT requirements of the compliance year, the Executive Officer may grant a one-year extension of the compliance deadline based on evaluation of information submitted by the fleet owner to support the application. There will be no extensions granted after January 1, 2018. By that date, any vehicle that is not equipped with the highest level verified PM DECS must be replaced or have its engine replaced with one that can be equipped with the highest level verified DECS for PM. During the period that these extensions are granted, the fleet must still comply with the appropriate NOx requirements of the regulation.

W. What if there are delays in the availability of verified OECS or new vehicles?

A fleet owner would not be penalized for manufacturer delays in the availability of retrofits, or replacement engines or vehicles, as long as the owner has purchased the required equipment or vehicle at least four months prior to the required compliance date or within 60 days of verified DECS failure. The fleet owner would have to identify the vehicles to be equipped with the verified DECS or repowered or replaced and immediately place them into operation upon receipt of the equipment or vehicles. The owner would also be required to keep records of purchase such as a purchase order or signed contract for the sale, including engine specifications for each applicable piece of equipment or vehicle,.

X. What if a verified OECS is not safe for a particular vehicle or vehicle application?

If a fleet owner believes that the highest level verified DECS for a vehicle impairs the safe operation of the vehicle, the owner would be able to request that the ARB find that the verified DECS should not be considered the highest level available. The requesting party would have to provide documentation to support its claims. ARB's Executive Officer may determine that there is no highest level verified DECS available.

Y. What are the reporting, labeling and recordkeeping requirements?

All fleets are required to maintain the records specified in the regulation. Fleet owners who chose the BACT compliance schedule option would not be required to report on their fleets. Fleets that chose to comply with the BACT percent limits option, fleet averaging option or any of the special provisions and compliance extensions would be required to report their affected vehicles and associated engine and retrofit data annually to ARB

starting in 2010. This is to ensure that the compliance status of an individual truck can be verified. These fleets would also be required to keep records of all data reported for 3 years after it is retired or January 1, 2025, whichever is earlier. The owner is required to provide these records to an agent or employee of the ARB within five business days upon request. The proposed regulation would also include requirements for the application of labels on certain agricultural vehicles and two-engine sweepers.

Z. How does the regulation apply to motor carriers, brokers, and dispatchers?

In an effort to ensure that all vehicle owners comply with the proposed regulation, in-state or out-of-state motor carriers, California-based brokers, or California residents that operate or direct the operation of any vehicle subject to the proposed regulation would be responsible for hiring fleets with compliant trucks. Both motor carriers and brokers direct the operation of their drivers, and as such, are in a unique position to verify compliance with the proposed regulation. Such a requirement is already in place for other aspects of motor vehicle compliance, such as requiring proof of vehicle insurance, proper drivers licensing, and proof of compliance with various drug testing, vehicle safety, and worker compensation requirements.

The proposed regulation would require these motor carriers and brokers to retain records documenting that the drivers they hire or dispatch are in compliance with the proposed regulation, but would have an affirmative defense for violations by a vehicle operator they dispatched if they can demonstrate that they verified the compliance status of the operator at the time they were hired or dispatched.

To assist these motor carriers and brokers, the proposed regulation includes the development of a system to allow them to easily determine the compliance status of any business or vehicle operator. Under such a system, vehicle owners would electronically report to ARB the information regarding their vehicles and their compliance mechanism. Upon completion, an Internet based system would generate a Certification of Reported Compliance that would be available for printing and would be available on-line. The system would allow motor carriers and brokers to determine which of their drivers have reported compliance with the proposed regulation to ARB.

V. DESCRIPTION OF PROPOSED CHANGES TO OTHER EXISTING REGULATIONS

This chapter outlines the proposed modifications to other existing ARB regulations. The language of the proposed amendments to these regulations is provided in Appendix B. A more detailed plain English summary of the proposed amendments are available in the TSD.

A. Why are **amendments** to other regulations being proposed?

A number of existing ARB diesel regulations are proposed to be amended to ensure that these existing regulations and the proposed regulation do not create overlapping requirements for the same vehicles, as well as to clarify a number of issues with the existing regulations, to provide additional compliance flexibility, and to generally improve enforceability of the existing regulations.

B. What other existing regulations are proposed to be amended?

The other existing regulations proposed to be **amended** are the:

- Public Agency or Utility On-road Heavy-Duty Diesel-fueled Vehicles Regulation;
- In-Use On-Road Diesel-Fueled Heavy-Duty Drayage Trucks Regulation;
- In-Use Off-Road Diesel-Fueled Fleets Regulation;
- Statewide Portable Equipment Registration Program (PERP) Regulation;
- Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards Regulation;
- ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling;
- Exhaust Emissions Standards and Test Procedures - 1985 and Subsequent Model Year Heavy-Duty Engines and Vehicles, and;
- ATCM for Diesel Particulate Matter from Portable Engines Rated at 50 Horsepower and Greater.

C. What are the proposed requirements for two-engine cranes?

To establish a better **regulatory** structure that would reduce emissions from two-engine cranes more effectively and at a lower cost, both engines of two-engine cranes would be added to the off-road vehicle regulation (the drive engine would be included regardless of whether it is certified as an on-road engine or as an off-road engine). Also, the upper engine of a two-engine crane would be removed from the scope of the Portable Equipment ATCM and excluded from most performance requirements in the PERP. However, the proposal would not remove the registration and inspection requirements of PERP. In addition, all cranes (excluding rubber tire gantry cranes) would be removed from the scope of the Cargo Handling Equipment regulation, thereby placing the control of two-engine and off-road cranes used at ports and intermodal rail yards in the in-use 'off-road regulation, and single engine cranes in the proposed regulation.

D. What changes to existing regulations will be made for two-engine sweepers?

As discussed in the last chapter, special provisions are included in the proposed regulation to address two-engine sweepers. The rationale for this is similar to that for providing special provisions for two-engine cranes.

To accommodate these provisions, a number of changes to existing regulations are also being proposed. This includes removing the upper engine of a privately owned two-engine sweeper from the scope of the Portable Equipment ATCM, and excluding the same engine from most performance requirements in the PERP. However, the proposal would not remove the registration and inspection requirements of PERP. The Public Agency and Utility Fleet regulation would be amended to allow public agencies to receive retirement credit for the sale of used two-engine sweepers having 2004-2006 model year propulsion engine to businesses in California. However, two engine sweepers owned by public agencies are not proposed to be included in the proposed regulation, and would need to continue to meet all other current regulatory requirements. This will allow for cleaner, used public fleet sweepers to be used by private sweeping companies instead of these cleaner vehicles being shipped out-of-state. Also, all sweepers would be removed from the scope of the Cargo Handling Equipment regulation, making them subject to the proposed regulation.

E. What changes are proposed for the Public Agency and Utility Regulation?

The proposed changes would expand the scope and applicability of the regulation to include light heavy-duty engines that were inadvertently omitted from the original scope of the regulation, as well as include PM BACT requirements for vehicles newer vehicles that were not equipped with a diesel particulate filter from the engine manufacturer. In conjunction with the expanded scope, a new provision would allow public agencies and utilities to apply for a one-year extension of the intermediate 2009 compliance deadline for light heavy-duty engines. The proposed changes would also clarify that federal fleets, and tribal (Indian) reservations and rancherias will be excluded in the definition of "municipality".

The proposed amendments would clarify how affected fleets receive credit toward their BACT requirement by retiring a vehicle according to the provisions of the rule, and would establish a process for qualifying a vehicle for retirement through out-of-state sales.

For privately-owned utilities, staff is proposing an optional two-year delay of the intermediate and final BACT PM requirement deadlines, accompanied with a requirement that by December 31, 2013, 30 percent of their total fleet vehicles meet a 2010 engine emission performance standard, and that an additional 20 percent of their total fleet vehicles meet a 2007 or newer engine emission standard.

F. What other changes are being proposed to the PERP?

In addition to the changes described above pertaining to two-engine sweepers and cranes, the PERP would be modified to allow unregulated Tier 0 secondary off-road engines on cranes and sweepers to be newly registered under PERP. These engines

would then only be subject to the inspection requirements and fees listed in the PERP regulation. Currently, non-registered Tier 0 secondary engines on cranes and sweepers are not allowed to be registered through PERP.

G. What changes to the idling regulations are proposed?

Changes to the commercial vehicle idling and new engine standards are proposed to exempt armored cars and workover rigs from the vehicle idling limits. These changes are being proposed because when an armored car is at a pick-up location, at least one guard must stay inside the vehicle. Since the environment inside of an enclosed armored car can become extremely uncomfortable, idling of the engine for climate control is essential to the health and safety of the onboard guard. The idling requirements for workover rigs are also proposed to be amended to exempt workover rigs from the motor vehicle idling limit while they are performing the work for which the vehicle was specially designed. This proposal would allow a workover rig to carry out its specialized function when the vehicle is stationary and the engine is working.

H. What changes to the in-use off-road diesel vehicle regulation are proposed?

Just as other on-road vehicles are required to have on-road engines when sold new and operated on the road, on-road vehicles subject to the in-use off-road diesel-fueled regulation (such as workover rigs and on-road two-engine cranes) must have on-road engines in them when sold new. New language is proposed in the regulation that would clarify the repower requirements for workover rigs and other on-road vehicles subject to the regulation. The proposed amendments would require that any replacement engine must be an on-road engine if the workover rig or other on-road vehicle is to be registered and driven on public roadways.

Staff is also proposing to clarify the exemption provision for low-use vehicles. The current regulatory language in the section exempts low-use vehicles from all of the performance requirements in the regulation. The proposed modifications would require that **low-use** vehicles comply with the requirements for adding vehicles to the fleet and with the idling requirement, which is consistent with staff's original intent in proposing the regulation.

VI. REGULATORY AUTHORITY

ARB has been granted both general and specific authority under the Health and Safety Code (HSC) to adopt the proposed regulation. HSC sections 39600 (General Powers) and 39601 (Standards, Definitions, Rules and Measures) confer on ARB, the general authority and obligation to adopt rules and measures necessary to execute the Board's powers and duties imposed by State law. HSC sections 43013 and 43018(a) provide broad authority to achieve the maximum feasible and cost-effective emission reductions from all mobile source categories, including both on-road and off-road diesel engines. Regarding in-use motor vehicles, HSC sections 43600 and 43701(b) respectively grant ARB authority to adopt emission standards and emission control equipment requirements.

Additionally, California's Air Toxics Program, established under California law by AB 1807 (stats. 1983, ch. 1047, the Tanner Act) and set forth in the Health and Safety Code (HSC) sections 39650 through 39675, mandates that ARB identify and control air toxics emissions in California. The identification phase of the Air Toxics Program requires the ARB, with participation of other state agencies, such as the Office of Environmental Health Hazard Assessment, to evaluate the health impacts of, and exposure to, substances and to identify those substances that pose the greatest health threat as TACs. ARB's evaluation is then made available to the public and is formally reviewed by the Scientific Review Panel (SRP) established under HSC section 39670. Following the ARB's evaluation and the SRP's review, the Board may formally identify a TAC at a public hearing. Following the identification of a substance as a TAC, HSC section 39665 requires ARB, with the participation of the air pollution control and air quality management districts (**districts**), and in consultation with affected sources and interested parties, to prepare a report on the need and appropriate degree of regulation for that substance. Based upon the findings of the report, ARB is vested with authority under sections 39666 and 39667 to adopt and enforce ATCMs that will respectively achieve emission reductions using best available control technology for nonvehicular and vehicular sources, the latter of which includes in-use heavy-duty vehicles.

ARB is proposing amendments to the PERP pursuant to authority granted in HSC sections 41750-41755.

1. Preemption under the Clean Air Act

The proposed regulatory actions would not be preempted by the federal Clean Air Act (CA) section 209. Section 209(a) preempts states from adopting emission standards relating to the control of emissions from new motor vehicles or new motor vehicle engines. Section 209(b) provides that the Administrator of U.S. EPA shall grant California a waiver of preemption, unless those challenging the waiver can show that certain specified criteria for denying the waiver have been met. Section 209(e)(1) preempts all states from adopting emission standards for new nonroad engines under 175 horsepower used in farm and construction equipment and vehicles and new

locomotives and locomotive engines.⁵ Section 209(e)(2) impliedly preempts all states other than California from adopting new and in-use emission standards and other requirements relating to the control of emissions of all nonroad not otherwise expressly preempted under section 209(e)(1). California can adopt and enforce regulations for these other nonroad engines upon receiving authorization from the Administrator of U.S. EPA. As with a section 209(b) waiver, the Administrator must grant authorization unless those challenging the authorization can demonstrate that certain specified criteria for denying the authorization have been satisfied.

The proposed in-use on-road diesel vehicle regulation would not be preempted under CAA section 209(a). The proposed regulation would not establish **emission** standards for new motor vehicles or engines; rather the proposed regulation would establish in-use performance requirements that must be met by in-use vehicles. To the extent that fleets elect to meet those performance standards by replacing in-use vehicles and engines with new vehicles and engines, those emission standards have previously been adopted and granted waivers under section 209(b).

The proposed amendments to ARB's previously adopted heavy-duty vehicle idling requirements are also not preempted by section 209. The idling requirements are in-use operational control measures that are specifically permitted under section 209(d), which provides that states have the right "to control, regulate, or restrict the use, operation, or movement of registered or licensed motor vehicles." The right to adopt in-use operational controls has been extended to nonroad engines. See *Engine Manufacturers Association v. EPA*, (D.C. Cir. 1996) 88 F.3d 1075.

The proposed amendments to California's off-road regulations are not preempted under section 209(e)(1) in that they do not apply to new off-road engines under 175 hp used in farm and construction vehicles or to new locomotives and locomotive engines. To the extent that ARB is proposing amendments to its in-use off-road programs, ARB has pending authorization requests before U.S. EPA for its previously adopted off-road regulations. Upon adoption of the proposed amendments, ARB intends to file a request with U.S. EPA that it confirm that the amendments fall within the scope of the previously submitted authorization requests.

2. Interstate Commerce Clause

The Commerce Clause of the United States Constitution (U.S. Const., Art. I, §8, cl. 3) grants Congress the power "[t]o regulate **Commerce** with foreign Nations, and among the several States. . . ." In addition to granting Congress an affirmative grant of authority, courts have found that the clause creates an implied restraint on state authority to enact legislation that imposes significant burdens on interstate commerce. (See *United Haulers Ass'n, Inc. v. Oneida-Herkimer Solid Waste Management Authority* (2007) 127 S.Ct. 1786; *Healy v. The Beer Institute* (1989) 491 U.S. 324, 326, fn.1.) The proposed regulation of in-use on-road diesel vehicles would not be in violation of this so-called

⁵ The federal term "nonroad" and California term "off-road" refer to the same types of engines and are used interchangeably.

Dormant Commerce Clause. The proposed regulation would not be *per se* unlawful in that it would not expressly discriminate against out-of-state heavy-duty vehicle fleets, have the practical effect or purpose of protecting California economic interests at the expense of out-of-state interests, or have an impermissible extraterritorial effect on other states.

When a state statute or regulation is neutral on its face, has only indirect or incidental effects on interstate commerce, and regulates evenhandedly, the courts have applied a balancing test that weighs the state's legitimate interests in adopting the regulation against the burden that the regulation may have on interstate commerce. (*Pike v. Bruce Church, Inc.* (1970) 397 U.S. 137.). Here, the proposed regulation, which achieves significant reductions in diesel PM, an identified TAC, and NOx, with concomitant reductions in health risks to the public (Le., resulting in fewer fatalities, hospitalization, lost school and work days) would provide great health and welfare benefits to the public. The benefits of the regulation, which would be adopted under the police powers granted to the State, clearly outweigh any burdens that the regulation would impose on interstate commerce.

3. *Regulatory Takings*

Some stakeholders have commented during the course of this regulation's development that the proposed regulation would result in a regulatory taking. Specifically, they argue that the proposed regulation forces the replacement of older, dirtier vehicles, and would significantly devalue the resale market for these vehicles. ARB staff does not agree that the regulation would result in an unconstitutional taking. The "Takings Clause" of the Fifth Amendment to the United States Constitution provides that the federal government shall not take private property for public use, without just compensation.⁶ The prohibition was extended to the states by the Fourteenth **Amendment**.⁷

Generally, in real property regulatory takings claims, courts have found a compensable taking if a regulation does not substantially advance legitimate state interests or has permanently deprived an owner of "all economically beneficial or productive use" of the land. (*Lucas v. South Carolina Coastal Council* (1992) 505 U.S. 1003, 1015; *Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency* (2002) 535 U.S. 302) In determining whether a state may avoid compensation when it has used its police powers for public health and welfare purposes, and the action has resulted in depriving

⁶ The Fifth Amendment provides in full:

No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a Grand Jury, except in cases arising in the land or naval forces, or in the Militia, when in actual service in time of War or public danger; nor shall any person be Subject for the same offence to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.

⁷ The Fourteenth Amendment provides in relevant part that "[no State shall] deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws."

an owner of all beneficial or productive use of his land, the courts have looked to see if the proscriptions of the regulation were, in fact, covered by preexisting implied limitations on the property owner's title. (*Lucas v. South Carolina Coastal Council, supra*, 505 U.S. at 1027.) In *Lucas*, the Court acknowledged that where such implied limitations exist, "the property owner necessarily expects the uses of his property to be restricted, from time to time, by various measures newly enacted by the State in legitimate exercise of its police powers." (*Id.*)

Of significance to the instant proposed regulation, the Court went on to clarify that implied limitations on ownership rights almost always exist with regard to the commercial value of personal property. The Court stated:

[I]n the case of personal property, by reason of the State's traditionally high degree of control over commercial dealings, [the personal property owner] ought to be aware of the possibility that new regulation might even render his property economically worthless. (*Id.*, at 1027-1028.)

In line with the Supreme Court's decisions with regulatory takings, the proposed regulation cannot be considered as unconstitutional. First, the regulation will not deprive the stakeholder of all beneficial value of the regulated engines and vehicles. Even those engines and vehicles that must be retired under the proposed regulation will continue to retain fair market value in domestic and international markets outside of California. Second, consistent with *Lucas*, even in the unlikely event the regulated engines and vehicles lost all of their beneficial value, ARB is exercising its vested police power authority to regulate in-use on-road fleets. Over the past 40 years, ARB has adopted a panoply of air quality regulations affecting nearly every vehicular source category. Given the extreme air quality problems confronting most areas of the state, owners of in-use on-road vehicles should be well aware that regulation of their fleets was likely to occur, especially given the high level of emissions associated with the operation of such vehicles.

VII. EMISSION IMPACTS

The proposed regulation is projected to provide significant diesel PM and NOx emissions reductions. This chapter will discuss the projected benefits of those reductions to public health and the environment.

A. What are the emission benefits of the regulation?

The proposed regulation would provide substantial diesel PM and NOx emissions reductions that would have a substantial positive air quality impact throughout California. By reducing emissions of pollutants that contribute to elevated ambient levels of PM2.5 and ozone, the proposed regulation would help achieve attainment of the NAAQS for these pollutants, and would meet previous emission reduction commitments in the South Coast and San Joaquin Valley SIPs. In addition, significant additional health benefits would also be obtained with the reductions of ambient levels of diesel PM.

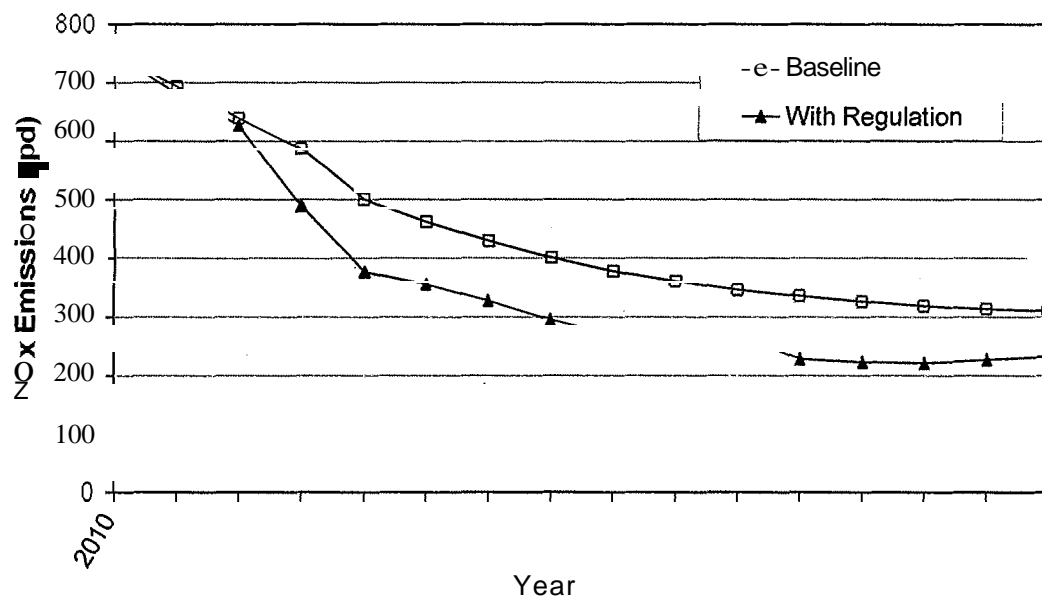
The proposed regulation is projected to reduce diesel PM emissions from the 2000 baseline by 80 percent in 2020. While this falls somewhat short of the 2020 goal set forth in the Diesel RRP for reducing diesel PM by 85 percent from 2000 baseline levels, the proposed regulation does achieve the maximum achievable reductions of diesel PM emissions from in-use on-road diesel vehicles.

The proposed regulation will provide significant near-term and long-term NOx benefits. The projected NOx emissions reductions from the proposed regulation are 124 tons per day (tpd) and 98 tpd, for 2014 and 2023, respectively. As shown in Table VII-1 and Figure VII-1, NOx emissions would be 25 percent lower in 2014, and 31 percent lower in 2023 than they would be in the absence of the proposed regulation.

Table VII-1: Statewide NOx Emissions Reductions from the Proposed Regulation

Emission Reductions	2010	2014	2017	2020	2023
NOx without Regulation (tons per day)	749	500	401	346	319
NOx with Regulation (tons per day)	749	377	296	266	221
Benefits (tons per day)	--	124	105	79	98
Percent Reduction	--	25%	26%	23%	31%

Figure VII-1: Projected NOx Emissions With and Without the Regulation

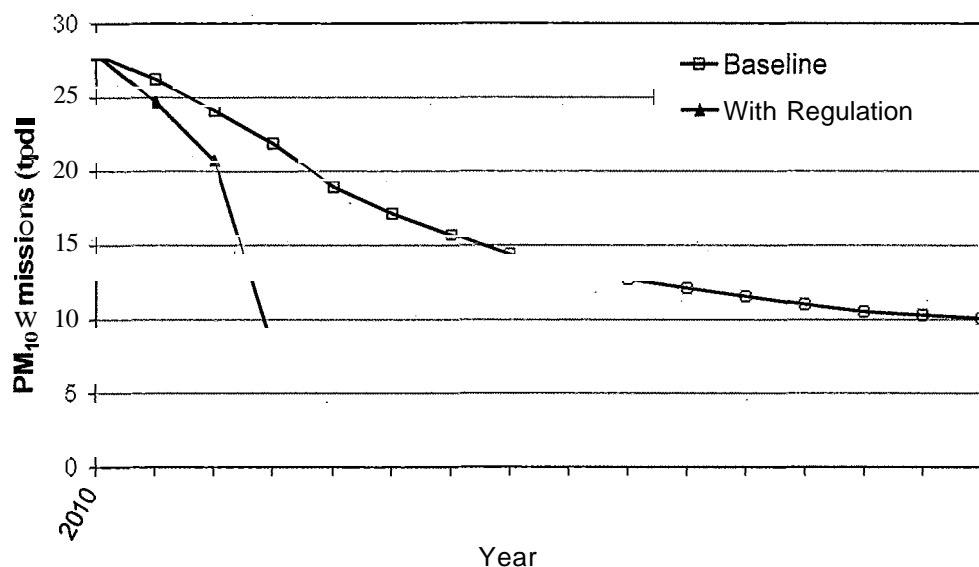


Similar to NOx; the proposed regulation will provide significant PM emission reductions. With the proposed regulation, PM emissions are projected to be reduced by about 13 tpd in 2014 and 3.5 tpd in 2023 relative to baseline levels. As can be seen in Table VII-2 and is shown in Figure VII-2, these reductions represent a 68 percent decrease in PM emissions in 2014 and a 33 percent decrease in 2023.

Table VII-2: Statewide PM Emissions Reductions from the Proposed Regulation

Emission Reductions	2010	2014	2017"	2020	2023
PM without Regulation (tons per day)	27.9	19.0	14.4	12.1	10.5
PM with Regulation (tons per day)	27.9	6.1	6.6	6.9	7.1
Benefits (tons per day)	--	12.8	7.8	5.2	3.5
Percent Reduction	--	68%	54%	43%	33%

Figure VII-2: Projected PM Emissions With and Without the Regulation



B. Does the proposed regulation meet California's SIP commitments?

The 2007 SIP (ARB, 2007a) was based on the applicable version of ARB's on-road motor vehicle emissions model, EMFAC2007. Staff, in support of this rulemaking, has undertaken comprehensive efforts to update and improve the truck inventory since the SIP was adopted. New data not available at the time of SIP development was used in assessing the costs and benefits of this statewide rulemaking. However, assessing the rule benefits in terms of meeting the regional SIP targets must be done with the SIP inventory, since the SIP inventory is the official inventory for judging SIP compliance.

The 2007 SIP truck measure envisioned modernizing truck fleets operating in California to the equivalent of the cleanest adopted new engine (2010) standards. The proposed regulation meets that goal on the pace necessary to meet all the SIP target dates. While the quantification of benefits with the new inventory is different than with the SIP inventory, the difference is in accounting not rule effectiveness. A primary reason for the difference is that new data shows there is more travel by newer, cleaner out of state trucks than previously estimated in EMFAC2007. As a result, fewer benefits can be attributed to the proposed regulation for out of state trucks because they will already employ 2010 compliant engines. The rule benefits are primarily attributed to the modernization of in state fleets that are older and dirtier. In short, the proposed regulation accomplishes the modernization of truck fleets as envisioned in the SIP.

Table VII-3 and Table VII-4 show, using the regional SIP inventories, the benefits of the proposed regulation compared to the expected reductions. The SIP targets in these tables refer to the fleet modernization portion of the truck SIP measure. The second part of the SIP measure for trucks, a program to address excess emissions, will be developed separately. The proposed regulation meets or exceeds the combined NO_x and PM_{2.5} SIP fleet rule targets in both the South Coast and San Joaquin Valley for all years. In 2014, in the South Coast, the SIP target is met with slightly more PM_{2.5} reductions and

slightly less NOx than expected. The PM2.5 modeling used in the South Coast Air District SIP shows that direct PM2.5 emission reductions are relatively more effective in reducing ambient particulate levels than are NOx reductions. As shown in Table VII-3, the rule achieves 60 tons per day of NOx in 2014 and the equivalent of six tons per day of NOx with the extra PM2.5 reductions. The SIP also included reductions in 2020 to support attainment in regions downwind of South Coast and the San Joaquin Valley. These 2020 goals are met for both regions.

Table VII-3: South Coast SIP Emission Reduction Targets for Trucks

Year	NOx (tpd in SIP inventory)		PM2.5 (tpd in SIP inventory)	
	SIP Target for Rule ¹	Rule	SIP Target for Rule ¹	Rule
2014	66 ²	60 ³ plus 6 equivalent tons	2.3	3.5 ³
2020	23	27	--	--
2023	15	22	--	--

¹ The truck measure reductions estimated in the SIP include the benefits of programs to reduce excess emissions. The numbers presented here are the SIP goals for the modernization rule only.

² This target represents expected benefits from the enhanced truck measure designed to provide additional reductions in 2014 for South Coast PM_{2.5} attainment and to accelerate ozone attainment in the San Joaquin Valley.

³ SIP compliance assessment includes agricultural truck compliance option.

Table VII-4: San Joaquin SIP Emission Reduction Targets for Trucks

Year	NOx (tpd in SIP inventory)		PM2.5 (tpd in SIP inventory)	
	SIP Target for Rule ¹	Rule	SIP Target for Rule ¹	Rule
2014	48	66	2.5	4.3
2017	49 ²	49 ³	--	--
2020	17	29	--	--
2023	8	23	--	--

The truck measure reductions estimated in the SIP include the benefits of programs to reduce excess emissions. The numbers presented here are the SIP goals for the modernization rule only.

² This target represents expected benefits from the enhanced truck measure designed to provide additional reductions in 2014 for South Coast PM_{2.5} attainment and to accelerate ozone attainment in the San Joaquin Valley.

³ SIP compliance assessment includes agricultural truck compliance option.

C. What effect would the regulation have on the health of Californians?

Between 2010 and 2025, staff estimates that the proposed regulation will provide emission reductions of approximately 34,600 tons of PM2.5 and 480,000 tons of NOx. These emission reductions would result in lower ambient PM2.5 levels and reduced exposure to diesel PM. Staff estimates that statewide, approximately 9,400 premature deaths (2,800 - 17,000, 95 percent confidence interval (95% CI) statewide would be

avoided by the year 2025 from the implementation of the proposed regulation. Estimates of other health effects avoided statewide include:

- 1,100 hospital admissions due to respiratory causes (600 to 1,600, 95% CI)
- 1,200 hospital admissions due to cardiovascular causes (730 to 1,800, 95%CI)
- 150,000 cases of asthma-related and other lower respiratory symptoms (59,000 to 230,000, 95% CI)
- 12,000 cases of acute bronchitis (0 to 25,000, 95% CI)
- 950,000 work loss days (800,000 to 1,100,000, 95% CI)
- 5,500,000 minor restricted activity days (4,500,000 to 6,500,000, 95% CI)

Benefits from the proposed regulation are substantial. Staff estimates the benefits to be \$69 billion using a 3 percent discount rate or \$48 billion using a 7 percent discount rate. (ARB follows U.S. EPA practice in reporting results using both 3 percent and 7 percent discount rates.) A large portion of the monetized benefits result from avoiding premature death. The estimated benefits from avoided morbidity are approximately \$510 million with a 3 percent discount rate and less than \$350 million with a 7 percent discount rate. Approximately 68 percent of the benefits are associated with reduced PM from NOx emissions, and the remaining 32 percent from direct PM emissions.

On a local level, as part of the Commerce Study, staff also estimated these same health benefits between 2010 through 2020. Such benefits would be a subset of the statewide numbers reported above. The anticipated benefits in and around the City of Commerce are:

- 78 avoided premature deaths (20 to 130, 95% CI)
- 60 avoided hospital admissions - respiratory and cardiovascular (24 to 90, 95% CI)
- 2,600 avoided asthma attacks (1,000 to 4,000, 95% CI)
- 220 avoided acute bronchitis (0 to 48, 95% CI)
- 14,700 avoided work loss days (11,500 to 16,500, 95% CI)
- 80,000 avoided minor restricted activity days (70,000 to 93,000, 95% CI)

D. What is the impact of the proposed regulation on potential cancer risk reduction

Overall, diesel PM emissions from on-road diesel vehicles are forecast to decrease in future years due both to the implementation of several regulations already adopted by the ARB, as well as from the proposed regulation. As noted previously, the proposed regulation will provide an 80 percent reduction in diesel PM emissions relative to the 2000 baseline. As diesel PM emissions decrease, so will the potential cancer risks associated with exposure to diesel PM.

On a local level, using the results from the Commerce study, staffs analysis estimates that risk levels in and around the city of Commerce will be reduced by over 80 percent, to

less than 70 in a million, by 2015. However, localized cancer risks will begin to increase as growth begins to surpass the reductions realized by the regulations, with the predicted remaining cancer risk in the 2020 timeframe rising to about 75 in a million in and around the city of Commerce. As vehicle miles traveled in the future continues, this increase in cancer risk will continue, albeit at a significantly lower rate of increase than would occur in the absence of the proposed regulation.

E. Are there potential risks associated with low-use and limited use agricultural vehicles?

To evaluate the potential impacts on risk from staff's proposed agricultural vehicle provisions, staff performed a screening health risk assessment of two "generic" agricultural processing facilities that might receive vehicles that do not meet the PM performance standards of the proposed regulation.

For its analysis, staff modeled two generic facilities, one in the Bakersfield area, and one in the city of Commerce. In its analysis, staff assumed that only vehicles that do not meet the PM performance standards (i.e., do not have diesel particulate filters) visited the facility. As such, to the extent that vehicles meeting the PM performance standards visit these facilities, the estimated risk impacts are a worst case. In other words, the potential risk impact of the proposed agricultural vehicle provisions depends not on the total number of trucks that visit a facility, but rather on the number of trucks that visit a facility and do not have PM controls installed. In addition, because this effort was designed as a screening evaluation, actual risk levels for a specific facility will vary due to site specific parameters, including the number of uncontrolled trucks and associated emission rates, operating schedules, routes traveled to the location, site configuration, site meteorology, and distance to receptors.

To investigate the potential risks associated with low-use and limited use agricultural vehicles used to transport agricultural commodities from the field to a processing facility, staff developed general assumptions bracketing a range of possible operating scenarios and estimated potential cancer risks. Using this approach, cancer risk was estimated as a function of the number of "uncontrolled" truck trips and the distance from the roadway or processing facility. Since the activity at any given processing facility can vary based on its throughput, staff's analysis provides an initial assessment of potential impacts of staff's proposal. However, unless an actual facility is modeled, using data specific to that facility, the actual risk from staff's proposal cannot be determined.

Table VII-5 below provides the results of staff's analysis for Bakersfield, and shows the distances from the facility or roadway boundary wherein the risk is above 10 in a million for different uncontrolled agricultural vehicle volumes. For example, a facility that has 28,800 roundtrip truck trips per year, the risk level of 10 in a million could extend to a downwind distance of about 1100 feet from the facility or roadway boundary.

Table VII-5: Distances from a Facility Boundary in Bakersfield wherein the Risk is 10 in a Million for Different Agricultural Truck Volumes

Truck Trips Near	Distance to Risk Level of 10 per Million (feet)
11,520	164
17,280	394
23,040	820
28,800	1,148
43,200	1,968
57,600	2,789

Because of the uncertainty with staff's analysis, it is unclear as to the actual impact of staff's proposal on sensitive receptors near agricultural processing facilities and along the roadways leading to them. While many of these facilities are located in rural areas, away from population centers, not all of them are. In addition, even for those that are located in rural areas, it is necessary in some instances for these vehicles to travel through more urban areas. Finally, while staff's analysis looked at individual facilities, it was not able to understand the cumulative impact of several facilities located in close proximity to one another. While staff does not believe that these findings are sufficient to delay staff's proposal for low-use and limited use agricultural vehicles, staff believes it is necessary to better understand this potential impact by evaluating several actual facilities throughout the state. Staff intends to continue their evaluation of the potential risk impacts of this proposal over the next 12 to 18 months, and, if appropriate, develop recommendations to ensure that the proposal does not result in an unacceptable impact on risk to communities.

F. What effect would the regulation have on global warming and greenhouse gas emissions?

Staff believes the net climate change effect of the proposed regulation would be positive. Staff's analysis of the climate change impact of the proposed regulation assessed only the direct emissions from the affected vehicles. Some actions to comply with the proposed regulation could increase carbon dioxide (CO₂) emissions by increasing fuel consumption, whereas other actions would reduce fuel consumption. For example, a vehicle owner who complies with the regulation by retrofitting the vehicle with a diesel particulate filter could potentially experience a decrease in the vehicle's fuel economy of about 2 percent, thus increasing CO₂ emissions. However, as the fleet is modernized to comply with the proposed regulation, improvements in fuel economy from newer vehicles are expected to offset the potential climate change impacts of the widespread installation of diesel particulate filters on the overall fuel economy of the fleet. In addition, the proposed regulation would also reduce emissions of black carbon - a component of diesel PM and a likely contributor to global warming - which would further reduce climate change impacts attributed to the overall impact on fuel economy.

VIII. COSTS AND ECONOMIC IMPACTS

This chapter discusses the estimated cost of the proposed regulation and the associated economic impacts across various business sectors and industries, on consumers, and on the State's \$3.1 trillion dollar economy. The economic impact on school districts and government agencies is also discussed.

A. How much would the proposed regulation cost?

The total regulatory cost of the proposed regulation is estimated to be \$5.5 billion, in 2008 equivalent dollars (\$2008), and represents the estimated cost of what fleets would have to spend to comply with the proposed regulation above what they normally spend for vehicle replacements. Of these costs, approximately \$4.5 billion is attributable to California based vehicles and California fleets, and approximately \$1.0 billion is attributable to vehicles registered out-of-state. This cost would be spread over the years 2010 to 2025, with the highest costs occurring in the years 2012 and 2013 and the lowest costs occurring in 2014. These costs represent the cost of early vehicle replacement with newer, cleaner vehicles, costs for PM retrofit devices, and other annual operating and maintenance costs.

Because of the challenges in estimating expected costs savings due to lower vehicle maintenance costs as a result of operating newer engines or vehicles, and because the cost estimate is not optimized for the least cost compliance options for fleets, these costs should be considered conservative. Also, expenditures for new vehicles that would be incurred in the absence of the regulation due to normal vehicle replacement (Le., money that fleets are already spending on new vehicles) was not attributed to the proposed regulation nor included in these estimates.

To put these regulatory costs in perspective, on an annual basis, the cost to the transportation and warehousing industry, which is the sector that will be most impacted by the proposed regulation, is estimated to be about 0.18 percent of their total gross domestic product; and in 2013, which is the highest capital cost year, the estimated cost is estimated to be about 0.3 percent of their total gross domestic product. It is important to note that while this cost is significant, it is only a small fraction of the overall cost benefits of the proposed regulation (estimated to be between \$48 and \$69 billion).

B. How much would the proposed regulation cost fleets?

Costs to individual fleet owners would vary depending on the size of the fleet, the vehicle types, vehicle age, and normal vehicle replacement practices. Costs would also vary depending on the compliance strategy chosen by each fleet. Additionally, depending on the compliance strategy selected, there could be ongoing costs for annual reporting and annual maintenance costs for verified PM DECS.

To understand the variability that exists in estimating costs for various fleets, it is important to understand the percentage of vehicles that will have to take actions under the proposed regulation. For interstate carriers, both in-state and out-of-state, the costs

are not expected to be significant, as approximately 65 percent of these fleets normally purchase new or newer vehicles that would meet the requirements of the proposed regulation, resulting in no costs for compliance. For instate operators, only 40 percent of fleets **regularly** purchase vehicles new enough to meet the requirements of the proposed regulation. In both these example, fleets that regularly purchase older used vehicles and keep them for longer periods would experience the highest increased costs. In general, the costs of the proposed regulation will fall predominantly on California based fleets, as these vehicles tend to be significantly older than those operated by out-of-state operators.

C. What would be the impact on an owner/operator?

The cost of the proposed regulation to a small business owner/operator would vary depending on a number of factors, including their normal vehicle purchasing practices, the number of miles traveled per year, and their vocation. For interstate owner/operators, staff estimates that over 60 percent purchase, **through** normal business practices, vehicles that would meet the requirements of the proposed regulation, resulting in no costs for compliance. For instate operators, this number falls to just over 20 percent.

To minimize costs to owner/operators, the proposed regulation provides that these fleets would be exempt from all the performance requirements of the proposed regulation until January 1, 2013, and then would only have to upgrade to a 2004 model year truck with a diesel particulate filter.

For the estimated 80 percent of the instate owner/operators who would not meet these requirements through normal purchases (because they typically buy older used vehicles and drives fewer annual miles), they would incur costs. As a worst case scenario, in 2012, an owner of a 1993 vehicle **would** need to replace the engine or the vehicle to comply with the proposed regulation. If the owner chose to buy a 6 year old tractor (which would be a 2007 model year truck having a diesel particulate filter), it would cost about \$35,000, where the older vehicle could be traded in for \$5,000. To handle these capital costs, the vehicle owner would likely need to obtain a loan of about \$30,000 with a payment of about \$700 per month (at a 12 percent interest rate). After accounting for higher truck reliability, lower maintenance costs, higher insurance costs, and depreciation, the owner's net cash flow could decrease about \$100 to \$200 per month for five years until the loan is paid off. Under this scenario, this operator could keep this vehicle until the end of 2020.

In addition, to the extent a small business would qualify for incentive funding (as discussed later), the anticipated compliance costs could be even lower, further reducing the economic impact.

D. What would be the impact of the proposed regulation on school districts?

Staff does not expect the proposed provisions for school buses to have a significant impact on school districts or school transportation providers. Taking into consideration \$200 million that are available through the Lower Emission School Bus program for bus

replacement and retrofit, the remaining regulatory costs only total about \$27 million over 8 years (2010-2017). Staff believes affected school districts should be able to absorb these costs into their existing transportation budgets.

E. What would be the impact on government agencies?

Because public fleets are already subject to the regulation for public agencies or utility on-road heavy-duty diesel-fueled vehicles, there will be no costs for these vehicles associated with the proposed regulation. However, costs to state government would be incurred primarily for additional staff resources needed by the ARB for outreach, implementation and enforcement. Other state agencies would not be affected. Implementation activities include statewide training workshops and seminars, one-on-one meetings, presentations at trade shows, and providing information at conferences and expositions. The proposed regulation would not affect federal funding to the state.

Because the applicability of the regulation for a public agency or utility on-road heavy-duty diesel-fueled vehicles is proposed to be changed to remove federal government fleets from that regulation to the proposed regulation, federal government fleets will incur costs associated with the proposed regulation. However, the representatives of the federal General Services Administration (GSA) indicated they would likely allocate 2007 and newer vehicles in the federal fleet to California to meet the PM requirements from 2011 to 2014 rather than installing verified PM DECS. They also indicated that after 2014 they would resume their normal vehicle replacement cycles and would meet the 2021 PM and NOx requirements without any accelerated replacements. As such, the anticipated costs to the federal government are expected to be negligible.

F. How would the proposed regulation affect different California industries?

The cost impact of the proposed regulation would vary across different California business sectors. As was previously discussed, the anticipated cost of the proposed regulation on California companies is about \$4.5 billion, in 2008 dollars. As can be seen in Table VIII-1, the transportation industry has the highest total costs of all the impacted business sectors, with the total increased costs expected to be about \$1.4 billion, in 2008 dollars. The construction industry is the second most impacted industry, with estimated costs of about \$1 billion.

Table VIII-1: Estimated Regulatory Costs by Business Sector

Business Sector	Increased Capital Costs (millions of \$2008)	Annual Costs (millions of \$2008)	Total Increased Costs (millions of \$2008)
Accommodation or Food Services	\$84	\$15	\$98
Agriculture, Forestry, Fishing, or Hunting	\$198	\$68	\$266
Arts, Entertainment or Recreation Services	\$14	\$1	\$15
Construction	\$960	\$100	\$1,061
For-Hire Transportation or Warehousing	\$1,359	\$486	\$1,845
Manufacturing	\$125	\$43	\$168
Mining	\$117	\$20	\$137
Other Services	\$85	\$49	\$133
Retail & Wholesale Trade	\$401	\$106	\$507
Utilities	\$4	\$10	\$14
Vehicle Leasing or Rental	\$208	\$71	\$279
TOTAL	\$3,554	\$969	\$4,523

To put these costs into context, it is useful to consider these costs relative to the gross domestic product of these industries. The gross domestic product is a relative measure of the revenue each industry generates, and was used by ARB when evaluating the economic impacts, in terms of changes in revenue and employment, of the proposed regulation. Table VII 1-2 below provides a summary of the estimated regulatory costs of the proposed regulation as a percentage of each business sector's overall gross domestic product.

Table VIII-2: Estimated Regulatory Costs a Percentage of Estimated Revenue (Gross Domestic Product) .

Business Sector	Annual Average (2010-2025)	Highest Year Capital Costs (2013)
Accommodation or Food Services	0.007%	0.022%
Agriculture, Forestry, Fishing, or Hunting	0.035%	0.082%
Arts, Entertainment or Recreation Services	0.003%	0.007%
Construction	0.056%	0.116%
Transportation or Warehousing (For-Hire)	0.181%	0.325%
Manufacturing	0.002%	0.005%
Mining	0.053%	0.148%
Other Services	0.054%	0.021%
Retail & Wholesale Trade	0.006%	0.013%
Utilities	0.002%	0.000%
TOTALS	0.018%	0.044%

As can be seen, as an average over the life of the proposed regulation, the estimated impact on gross domestic product for all business sectors is less than 0.02 percent; and in many cases considerably less. Even in the highest capital cost year (2013), the greatest impact is on the transportation and warehousing sector, with an estimated impact of about 0.3 percent of gross domestic product.

However, during this same time, the proposed regulation will likely create new business opportunities in the new and used vehicle sales industry, in the supply and distribution of urea for use in selective catalytic reduction systems, and for the sales, installation, and maintenance of verified PM DECS.

G. How significant would the proposed regulation's costs be to fleets, and how would fleets handle the costs?

Staff expects many, if not most, affected businesses to pass through the regulation's costs to their customers. This could be achieved, for example, through higher shipping rates, or higher costs for manufactured goods, resulting in higher revenue (but not necessarily higher profits) for affected fleets. For example, for many transportation companies, staff has estimated that revenue (on a per mile basis) would need to increase by less than one percent, or less than \$0.01 per mile, to offset the costs of the proposed regulation. For many operators, typical per mile revenues can range from \$1.00 to \$1.50.

Because staff had limited data from fleets to be able to perform a cash flow analysis to evaluate the ability of fleets to absorb the costs of the proposed regulation, staff was unable to perform a detailed assessment. However, based on the estimated gross domestic product impacts of the proposed regulation, staff believes many fleets would be able to absorb the costs of the proposed regulation if they were unable to pass through the costs. In addition, to the extent fleets, and in particular small fleets, pursue available incentive funding, this impact may be mitigated or eliminated.

H. What are the cumulative impacts of the proposed regulation on businesses?

As part of their assessment, staff attempted to evaluate the cumulative impacts of multiple ARB regulations on various business sectors impacted by the proposed regulation. Staff assessment primarily focused on two sectors: transportation and warehousing, and construction, as these two business sectors represent a significant portion of the overall costs of the proposed regulation. Despite a number of public and private requests for financial information to perform a thorough analysis, staff did not receive the information necessary to fully evaluate and assess the cumulative impacts of these regulations on these business sectors. However, staff utilized alternative methods to evaluate the extent to which fleets were impacted to provide a qualitative assessment. "The results of staff's evaluation are discussed below.

For transportation and warehousing, staff evaluated the interaction of a number of different existing regulations with the proposed regulation. These included the in-use off-road diesel vehicle regulation and the portable engine ATCM. First, using data obtained from a survey of the transportation sector developed and administered by staff, staff found that only about 14 percent of the fleets were impacted by multiple regulations. In addition, of those that also had to comply with the in-use off-road diesel vehicle regulation, 12 of the 14 percent met the definition of a small fleet under that regulation, meaning they did not have to replace any of their off-road vehicles, and did not have to install verified DECS until 2015. Since the regulatory compliance timelines between these regulations for these fleets typically do not overlap, since few fleets are impacted by multiple regulations, and since most of those that are impacted only have to meet lesser requirements in the in-use off-road diesel vehicle regulation, staff does not believe that, overall, many fleets in the transportation sector will have to address the issue of cumulative costs with these regulations; and for those that do, staff does not believe that the costs should be significant.

For the construction sector, staff evaluated the interaction of the proposed regulation with the in-use off-road diesel vehicle regulation. Staff estimates that of the estimated 76,000 on-road construction trucks, only about a third of them are in large, off-road construction fleets, and many of these on-road vehicles are medium heavy-duty vehicles, which are significantly less expensive to replace. Based on data collected as part of the rulemaking for the in-use off-road diesel vehicle regulation, staff estimated that these fleets would incur an additional 6 percent in compliance costs for the proposed regulation above what would be expected from complying with the in-use off-road diesel vehicle regulation. As such, staff does not believe the cumulative costs for these construction fleets will be significant.

I. How would the proposed regulation affect consumers?

In the context of the State's \$3.1 trillion economy, the economic impact of the proposed regulation is minor and is not expected to impose a noticeable impact on consumers. However, if all of the regulatory costs were passed through to consumers, staff estimates this could result in a modest increase in the price of consumer goods of about 0.04

percent in the highest cost year (2013), and about 0.014 percent on average over the life of the proposed regulation. To put this into context, this equates to about a 1 to 2 cent increase for a pair of shoes, less than one one-hundredth of a cent increase per pound of produce, or an increase of from \$3 to \$10 for a new car.

J. How would the proposed regulation impact the value of the existing vehicles?

To meet the requirements, many fleets would need to replace older vehicles with newer ones having cleaner engines. This would tend to decrease the value of older, dirtier vehicles and increase the value of newer, cleaner vehicles. However, even with these requirements, and the inability to operate older vehicles in California, the demand in the United States and around the world for quality used vehicles will remain. Staff expects that the worldwide demand for trucks such that these older vehicles will continue, meaning these vehicles should retain much of their residual value, less increased transportation costs to destinations outside California.

However, staff cannot predict with certainty the decrease in value of older vehicles as a result of the regulation; but for modeling purposes, staff assumed a decrease in value ranging from no cost for out-of-state vehicles, to up to \$5,000 per vehicle for in-state, single unit trucks, which represents the estimated shipping costs for transporting a vehicle for sale out-of-state or to make needed modifications for sale out of state.

K. What would be the statewide economic impact of the proposed regulation?

Increased costs of the proposed regulation would affect the California economy through many complex interactions. In addition to an assessment of the regulation's impact on individual fleets, staff in consultation with University of California, Berkeley researchers also conducted an assessment of the economic impacts of the proposed regulation on the California economy. Staff used a computable general equilibrium model of the California economy called E-DRAM to model the many complex interactions of the California economy. The results of the analysis confirmed that in the context of the State's economy, the economic impact of the proposed regulation is minor and is not expected to impose a noticeable impact.

The impact of the proposed regulation on the California economy was evaluated in the year 2013, when the annual costs to the affected industries were the highest. Staff projects the costs of the proposed regulation would reduce California economic output by roughly \$1.3 billion (0.04 percent). Personal income projections would also decline by roughly \$500 to \$600 million (0.03 percent) in 2013. Changes in the overall economy on the order of 0.04 percent are not expected to be noticeable.

The E-DRAM analysis did not include the economic benefit expected from decreased health costs resulting from the proposed regulation. The economic valuation of the health impacts are estimated to range from \$48 to \$68 billion from 2010 through 2025 and would more than offset the anticipated costs of the proposed regulation.

L. What would be the impact of the proposed regulation on employment?

Because the proposed regulation would impose a cost on the overall economy; staff expects it could reduce overall employment in California by a small amount. In 2013, the highest cost year, employment would be expected to decrease by about 4,600 to 13,600 jobs (less than 0.08 percent) in 2013, out of an estimated 14.3 million jobs statewide. This decrease would be spread throughout the economy, and not just felt by anyone business sector directly impacted by the proposed regulation. However, as the California economy continues to grow and add new jobs over the foreseeable future, the proposed regulation would not eliminate the creation of new jobs in California, but it may slow the rate at which new jobs are created.

M. How cost effective would the proposed regulation be and how does this compare to previous measures adopted by ARB?

The cost-effectiveness for the proposed regulation is determined by dividing the total capital costs of the proposed regulation by the total pounds of diesel PM and NOx reduced during the years 2010 to 2025. The expected cost effectiveness of this regulation is \$1.76/lb for NOx and \$46/lb for PM. All costs are in 2008 equivalent expenditure dollars.

In considering the cost effectiveness of the regulation relative to premature mortality avoided, a PM cost effectiveness of \$46/lb of PM is about 5.5 times lower than the U.S. EPA's benchmark for value of avoided death (which equates to about \$248/lb). Therefore, this regulation is a cost-effective mechanism to reduce premature deaths that would otherwise be caused by diesel PM emissions without this regulation relative to that benchmark.

Table VIII-3 compares the estimated cost-effectiveness of the proposed regulation to the estimated cost-effectiveness of other recently adopted diesel regulations. For comparison purposes, all cost-effectiveness estimates shown attribute part of the total rule cost to PM reductions and part to NOx reductions. Rules are ranked from lowest \$/lb PM cost to highest.

Table VIII-3: Comparison of the Average Cost-Effectiveness of the Proposed Regulation to Average Cost Effectiveness of Recently Adopted Air Toxic Control Measures

Rule	2008 \$/lb NOx Cost-effectiveness	2008 \$/lb PM Cost-effectiveness	Source of Estimate
Stationary Compression Ignition Engine ATCM	0.92/lb HC+NOx	\$7.70/lb PM	(ARB,2003b)
Portable Engine ATCM	<\$2/lb NOx	\$8-10/lb PM	(ARB,2004)
Cargo Handling ATCM	\$1/lb NOx	\$21/lb diesel PM	(ARB,2005c)
Solid Waste Collection Vehicle ATCM	1.79/lb HC+NOx	\$32/lb PM	(ARB, 2003a)
In-Use Off-Road Diesel Vehicle Rule	\$2.1 - 2.5/lb NOx	\$37 - 43/lb PM	(ARB,2007b)
Proposed Regulation	\$1.4 - 1.9/lb NOx	\$42 - 48/lb PM	See Ch. XIII
Public Fleets Rule	\$10.9/lb HC+NOx	\$160/lb PM	(ARB, 2005d)

IX. AVAILABILITY OF INCENTIVE FUNDING TO COMPLY WITH THE REGULATION

This chapter discusses the current and future availability of incentive funding programs, and how they may help eligible affected fleets.

A. Are there state incentive funds available to help fleets comply with the regulation?

Yes, but not enough to cover the majority of the costs of the proposed regulation. State incentive funding programs have historically played a complementary role to the state's regulatory emission reduction programs towards meeting the state's SIP requirements and achieving California's air quality goals. California's funding programs typically require participation prior to established regulatory deadlines; thus to qualify, fleets affected by the proposed regulation will need to act quickly if they are interested in pursuing the limited amount of available state incentive funding.

In 2006, California voters approved the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 (Proposition 1B). This measure authorized the California Legislature to appropriate \$1 billion for emission reductions in the State's good movement corridors. In approving the Proposition 1B Program, the Board has targeted \$360 million to provide incentives to clean-up heavy duty trucks (those not routinely serving seaports or intermodal rail yards). Eligible upgrades include retrofits, repowers, and replacements with funding in the form of grants for purchase or lease-to-own programs. The Proposition 1B ballot language directs ARB to fund emission reductions not otherwise required by law or regulation. Therefore, once the Board adopts a regulation, upgrades eligible for funding must result in early reductions in advance of the BACT compliance date or achieve extra reductions beyond what is required in the BACT requirements.

In addition, created in 1998, the Carl Moyer Program provides incentive grants to encourage the voluntary purchase of cleaner-than-required engines and equipment that provide early or extra emission reductions. Eligible projects include cleaner on-road, off-road, marine, locomotive and stationary agricultural pump engines. The program achieves near-term reductions in emissions of NOx, PM, and HC. Over its first seven years, the Carl Moyer Program provided \$170 million to clean up approximately 7,500 engines throughout California. Legislation in 2004 provided the Carl Moyer Program with up to \$140 million per year through 2015. Similar to the Proposition 1B funding, State law requires that Carl Moyer Program projects provide emission reductions early or beyond what is required by regulation.

Finally, Assembly Bill (AS) 118 created, among other things the Air Quality Improvement Program (AQIP) to be administered by ARB. The AQIP has about \$50 million annually beginning in FY 2008-09 to improve California's air quality by funding vehicle and equipment projects, air quality research, and advanced energy technology workforce training. In the State's fiscal year 2008-09 budget, about \$48 million was made available for loans to aid heavy-duty vehicle owners that would be impacted by the proposed

regulation. It is expected that this money, if used to provide government backed loans, can leverage more than \$300 million in private sector lending.

Many Federal and State programs are administered by **local** agencies so vehicle owners should check with their local air quality management district for funding opportunities. In addition, certain vehicles may have their own specially funded programs based on type and use. For example, the Ports of Long Beach and Los Angeles fund the Gateway Cities Clean Air Action Program via a combination of use fees and other matching sources and anticipates upgrading over 16,000 trucks in the next five years (fact sheets). Other agencies and jurisdictions may also have funding available for air quality improvement programs.

B. How will these funding programs change because of the proposed regulation?

Because these programs are intended to achieve early, surplus emission reductions that would not otherwise be realized through regulation, these programs will necessarily need to change in response to the proposed regulation. However, this offers an opportunity to structure these programs to more efficiently utilize these limited amounts of money, and target their use towards those most in need.

Under the Proposition 1B funding, staff is currently evaluating changes to better integrate funding options with the proposed regulation. These potential changes include expanding of the schedule flexibility currently provided for independent owner/operators to also include small fleets of 3 or less trucks and to provide a mechanism to provide an advantage to trucks owned by small fleets of one to three trucks in the competitive process for funding. Staff is also considering an option to allow some medium heavy-duty trucks engaged in goods movement to compete for funding, and providing an alternative calculation of emission reductions based on hours of operation (rather than miles traveled) to allow construction industry trucks to compete for funding. Finally, staff is considering updating the funding amounts to encourage truck replacements with models meeting 2010 emission standards and to recognize the potential availability of more effective combined PM/NOx retrofit devices, as well as the addition of a combined grant/loan guarantee program.

As part of this proposal, a number of changes to the Carl Moyer Program Guidelines are being presented to assist small fleets. Small fleets of up to three vehicles would be eligible for incentive funding through the end of 2010 to comply with the December 31, 2012, compliance deadline. In addition, the first truck in a small fleet would be eligible for incentive funding for a 2010 truck through the end of 2012. Also, limited use agricultural vehicles would be eligible through 2013, and low use or specialty agricultural vehicles would be eligible through 2019. Staff is also proposing a number of other changes, as shown in Table IX-1 below.

Table IX-1: Proposed Carl Moyer Program Guidelines Changes

Guideline Provision	Existing Criteria	Proposed Criteria
<i>On-Road Fleet Modernization</i>		
Eligible engine and chassis model year for old truck	1990 and older	1993 and older
Maximum eligible funding	80 percent of vehicle cost for fleets of 5 or less; 50 percent for fleets of 6 or more	80 percent up to \$50,000 per vehicle with engine certified to 1.2 g/bhp-hr standard; 80 percent up to \$75,000 per vehicle with engine certified to 0.2 g/bhp-hr standard.
Two vehicles to one option	not available	Replacement of two similar older vehicles with one newer vehicle
Minimum Project life	3 years	2 years for small fleets compliance with 2012 deadline
<i>On-Road Retrofit</i>		
Eligible engine model years"	no restriction	2004 or later for small fleets; 2005 or later for large fleets (requires highest level retrofit verified for specific engine)
<i>Agricultural Vehicles</i>		
Reporting to ARB	None	Must obtain the agricultural vehicle designation" from ARB before application
<i>All On-Road Carl Moyer Program Funded Projects</i>		
Funding contract restriction on proposed regulation compliance options	None	Applicant must use BACT Compliance Schedule, not BACT Percentage Limits or Fleet Averaging, for compliance during the contract term

Staff believes these changes will expand eligibility for fleet modernization projects, better clarify the funding opportunities under the Carl Moyer Program, and improve the overall effectiveness of the program, especially as it relates to small fleets. However, large fleets with more than three vehicles will have few remaining funding opportunities that are surplus to the proposed regulation.

C. How will these various program be integrated with the proposed regulation?

Absent any State funding through a grant program to provide down payment assistance, a vehicle owner may see interest rates on qualifying bank loans in the range of 12 percent to 15 percent, on average, with terms that may run between 5 and 7 years. This assumes a new dual axle tractor without a sleeper berth costs about \$115,000. Monthly payments would average about \$2,300 per month, ranging from \$2,000 to over \$2,700 per month. Under the current economic climate, many qualifying owner/operators

may not have the same access to financing as they did in a more favorable economy. Similar lending trends are occurring in other financing establishments (e.g., dealership financing, .etc.) as well.

Grants from either Proposition 1B Program or the Carl Moyer Program as the sole financial assistance source can provide significant financial assistance to the vehicle owner. As an example, an award of \$50,000 from the Proposition 1B program for a new 2010 model year truck would provide a down payment that may qualify the vehicle owner for a bank loan with interest rates and terms similar to those referenced above. However, the loan balance would be less due to the grant as down payment assistance. The resulting schedule of payments may equate to approximately \$1,300 per month, ranging from about \$1,150 to \$1,550 per month.

Qualifying owners may also receive grants through the Carl Moyer Program's fleet modernization program. Depending on local requirements, grant awards may be as high as \$75,000 for a new 2010 model year truck, with resulting loan payments (for the balance of the vehicle purchase price) of less than \$800 per month.

Additional financial assistance through a State loan guarantee program could provide added "bankability" for the profiled owner/operator. By reducing the risk of default by covering a percentage of the principle of the loan and other fees, banks may provide more competitive loans at rates that may range from 8 percent to 10 percent. Terms of the loan may also be extended from the **traditional 5-7 year** schedule to a 10 year schedule. Such terms are directly tied to the vehicle owner's economic profile. Combining a grant from one of the State's existing programs, combined with the ARB's loan program, could not only enhance the profiled vehicle owner's "bankability," but may also significantly provide a more favorable financing schedule.

D. What special funding is available for upgrading and replacing school buses?

California's Lower-Emission School Bus Program (LESB Program) is administered by ARB and is implemented by the local air districts. The LESB Program supports the retrofit and replacement of public school buses, and the retrofit of school buses operated by private companies contracted by public schools to provide home-to-school transportation.

The LESB Program was appropriated \$200 million by the Legislature in 2007, and the LESB Program guidelines were updated in early 2008. Qualifying projects are allowed up to \$20,000 for a verified PM DECS, including 10 years of maintenance costs for 1987 and newer buses. Up to \$140,000 is also available for replacement of pre-1987 buses. Up to 10 percent of the award amount is also available for infrastructure improvements for alternative-fueled buses. It is anticipated that over 1,100 replacements and 3,500 retrofits could be funded through the LESB Program.

X. TECHNOLOGY AVAILABLE TO MEET REGULATORY REQUIREMENTS

This chapter discusses the availability of technology to meet the requirements of the proposed regulation, with a particular focus on retrofit strategies and their feasibility.

A. What **are** verified diesel emission control systems and how do we know they really work?

The regulation would only require and **give** credit for diesel emission control systems that have been verified by ARB. ARB adopted a procedure to verify retrofit diesel emission control systems in 2003. Verification is an approval from ARB, which tells end users that the verified device achieves the advertised emission reductions and is durable. To be verified, retrofit devices must demonstrate the efficacy and durability of their products and provide a warranty. The warranty guarantees the retrofit's efficacy for 5 years or up to 150,000 miles or more, depending on engine size and age, and warrants that the retrofit will not cause engine damage.

ARB's verification procedure is a multi-level verification system consisting of three PM reduction levels and optional NOx reduction levels (see Table X-1) Reductions in NOx are not required for verification, but ARB's procedure recognizes and verifies NOx reductions that are greater than or equal to 15 percent in 5 percent increments. This system has broadened both the spectrum of control technologies available to participate in California's diesel emission control effort and the number and types of vehicles and engines that can be controlled. This multi-level approach to verification is consistent with the goal of achieving the maximum reductions in diesel PM emissions that are economically and technologically feasible. At this time, nearly all the verified emissions control strategies are retrofit exhaust aftertreatment devices.

Table X-1: Diesel Emission Control Strategy Verification Levels (as adopted by the Board in January 2008)

Pollutant	Reduction	Classification
PM	<25%	Not verified
	>25%	Level 1
	>50%	Level 2
	>85%, or < 0.01g/bhp-hr	Level 3
NOx	<25%	Not verified
	>25%	Mark 1
	>40%	Mark 2
	>55%	Mark 3
	>70%	Mark 4
	≥ 85%	Mark 5

B. What exhaust retrofits would the regulation require?

Meeting the PM performance requirements of the proposed regulation would, in most cases, require the use of a diesel particulate filter. A diesel particulate filter is a Level 3 DECS that typically consists of a ceramic wall-flow monolith or a silicon carbide substrate that captures PM before it can be released to the atmosphere. The accumulated soot is then burned off (regenerated) either through an active or passive process. In passively regenerated diesel particulate filters, the substrate is coated with a catalyst that burns off the collected PM during "regeneration." In actively regenerated diesel particulate filters, an external source of heat such as an electrical heater or fuel burner is used to oxidize the collected PM. Currently, the only technology that achieves the required NOx performance standard is a 2010 model year engine.

C. What devices have been verified for On-Road vehicles?

Table X-2 shows the Level 3 diesel emission control systems that have been verified by ARB for use in on-road diesel vehicles. There are currently 8 Level 3 PM retrofit devices for on-road use that have been verified by ARB. There are only two Level 3 PM devices that also provide verified NOx reductions. The most current list of verified DECS, applicable engine families, as well as the EO letters may be found on the ARB website, <http://www.arb.ca.gov/diesel/verdev/vtlcv.htm>.

Table X-2: **Verified** level 3 DECS (as of October 2008)

Product Name	Technology Type	PM Reduction	NOx Reduction	Applicability
Cleaire Horizon	DPF	85%	N/A	Most on-road engines
Cleaire Longview	Catalyst and DPF	85%	25%	1993-2003 model year on-road
Donaldson DPM	DPF	85%	N/A	1993-2004 on-road
HUSS FS_MK	DPF	85%	N/A	Most on-road engines
International Truck	DPF	85%	N/A	1994-2003 on-road Navistar engines
Johnson Matthey CRT	DPF	85%	N/A	1994-2006 on-road engines
Johnson Matthey EGRT	EGR/DPF	85%	40%	International, Cummins & DDC on-road
ECSYSTEM Purifilter	DPF	85%	N/A	1994-2003 on-road engines

D. Have diesel particulate filters been used in on-road applications?

Yes. Throughout the world, hundreds of thousands of diesel particulate filters (DPF) are in use, both in new vehicles and in numerous on-road retrofit applications including transit buses, heavy-duty trucks, medium-duty trucks, school buses, and solid waste collection vehicles. These devices have been installed on both private and public vehicles worldwide.

In California alone, thousands of diesel particulate filters have been funded through the Carl Moyer program, and have been installed in response to existing regulations targeting urban buses, transit fleet vehicles, solid waste collection vehicles, vehicles owned by public agencies, drayage trucks, and others.

E. Are engine repowers really possible?

Repowering a vehicle is defined as replacing an existing engine with a newer cleaner engine. It is an attractive strategy for owners of vehicles whose engines have reached their useful life before the other vehicle components are ready for retirement. It is most cost-effective when newer or new machine replacement costs are much higher than the costs of repowering. Good candidates for repowering include very expensive and specialized equipment or vehicles.

However, repowering projects may not be a viable option due to physical and technological constraints with installing a newer engine in an older chassis. For instance, the engine compartment may be too small to physically fit the new engine or may not allow for proper air circulation. Repowers may require modifications to the cooling system, wiring harness, engine control module, exhaust system, and/or transmission. While some vehicles have been repowered to 2004 to 2006 model year engines through the Carl Moyer program, the feasibility of repowering vehicles to 2007 to 2010 model year engines is unclear, and may be limited due to costs and limited space.

F. Are NOx exhaust retrofits feasible?

Today, for widespread use, only one NOx retrofit is verified for use with a significant number of on-road diesel engines. The Cleaire Longview integrates a NOx reduction catalyst and catalyzed wall-flow silicon carbide diesel particulate filter to provide simultaneous reduction of NOx, PM, hydrocarbons (HC), and carbon monoxide (CO). The Longview system injects diesel fuel (as the reductant) over the NOx reduction catalyst to achieve NOx reductions. For engines that operate within the temperature parameters of this system (the engine must spend more than 40 percent of its time with an exhaust temperature over 260 degrees Celsius (OC), this system has been verified to provide a 25 percent reduction of NOx emissions.

While higher level NOx emission control strategies that combine Level 3 PM control are not yet verified, one technology, selective catalytic reduction (SCR), is quickly approaching widespread commercial readiness for retrofit applications. SCR technology is already mature in stationary applications, and is beginning to emerge as a NOx control solution for new on-road diesel vehicles, both in Europe and North America. SCR systems use a reductant, typically urea, to convert NOx to nitrogen and oxygen over a catalyst. A precise amount of reductant is injected into the exhaust upstream of the catalyst. If the reductant is well mixed with the exhaust and the exhaust temperature is adequate, (typically between 250 and 450°C) an SCR system can achieve NOx reductions on the order of 50 to 90 percent. Urea-SCR systems are expected to be widely used to meet the U.S. EPA 2010 NOx standard of 0.2g/bhp-hr for new engines.

SCR systems are also now emerging as a retrofit option for reducing NO_x emissions from existing heavy-duty engines. Many SCR retrofit projects are currently underway in the U.S, with several demonstration programs occurring in California. In 2008, the Sacramento Metropolitan Air Quality Management District and the Sacramento Emergency Clean Air and Transportation program provided a \$500,000 grant to retrofit a fleet of 16 class 8 trucks owned by northern California grocery store chain Raley's with Johnson Matthey's SCR retrofit system, the SCRT®. Johnson Matthey is conducting a similar demonstration in southern California in partnership with the South Coast Air Quality Management District and Ralph's Supermarkets.

Johnson Matthey's SCRT is a 4-way emission control technology system which reduces NO_x by 70 to 90 percent and PM by over 90 percent. It also reduces CO and HC. The urea-based SCR technology is combined With Johnson Matthey's 2-stage CRT® particulate filter system. A controlled amount of urea is then injected into the exhaust before it enters the SCR catalyst bed providing the necessary chemical conditions for the SCR catalyst to reduce NO_x. Preliminary findings in the above studies suggest that the SCRT® system reduced engine-out NO_x in the Raley's trucks by an average of 84 percent (compared to pre-retrofit levels) (Johnson Matthey, 2008).

Despite the potentially substantial NO_x reductions SCR can provide, exhaust temperatures (or duty cycle limitations) will likely dictate the actual suitability of certain vehicles to use SCR or other NO_x-control technologies in exhaust retrofit applications. In general, SCR systems need to operate in temperature regimes similar to those required for passive DPF systems.

XI. AVAILABILITY OF DEVICES AND VEHICLES

This chapter provides staffs assessment of the estimated current and future supply of retrofit devices, as well as cleaner new and used vehicles, which will be needed to meet the anticipated demand created by the proposed regulation.

A. Would enough exhaust retrofits be available to satisfy the requirements of the proposed regulation?

During the first few years of the proposed regulation, the projected increase in demand for verified PM DECS (typically diesel particulate filters) in California is less than 38,000 units per year, which is about 15 percent of the total number of diesel particulate filters sold nationally each year (including those sold with new engines). Staff has contacted several diesel particulate filter manufacturers inquiring about their manufacturing capacities, and they have indicated that their manufacturing facilities are capable of producing over a million diesel particulate filters on an annual basis. However, in the unlikely event that there is an unanticipated disruption in the manufacturing, distribution and supply for diesel particulate filters, the proposed regulation contains a provision to allow for manufacturing delays such that fleets are not penalized for such circumstances.

B. Would enough new and used **vehicles** be available to help satisfy the regulation's requirements?

Of the approximately 940,000 diesel vehicles subject to the proposed regulation, only a portion of them are going to be replaced because of the proposed regulation. This is because in many cases, fleets naturally replace their vehicles on a regular basis that is faster than what the regulation would require. Staff estimates that between 2010 and 2014, demand for new or near-new vehicles as a result of the proposed regulation will increase to about 20,000 each year. Of this, staff expects that about 7,000 of these vehicles each year will be purchased new, with 2010 and later model year engines. The remaining 13,000 vehicles are expected to be near-new used vehicles, having engines that are 5 years old or newer.

To evaluate whether there are sufficient vehicles available to meet this demand, staff evaluated the availability of both new and used vehicles. In evaluating the availability of new vehicles, staff relied on data that shows that while new class 8 truck production has, as recently as a few years ago, been as high as over 250,000 per year, recent demand has reduced this to about 150,000 annually. Medium heavy-duty truck sales for 2006 were over 200,000 (Wards, 2007). Since the proposed regulation will result in an incremental increase of only about 7,000 new vehicles a year, staff believes there is sufficient engine and vehicle production capacity to meet this increased demand.

Staff also considered the currently available availability of near-new used vehicles. In its evaluation, staff found over 100,000 used trucks for sale on just two popular used vehicle websites (Truckpaper.com, 2008, Commercialtrucktrader.com, 2008), with about 60 percent of the listings being vehicles that were 8 years old or newer. Based on the rate of new vehicle listings that are posted each month, staff estimates that over the

course of year, over 150,000 used truck listings for near-new used vehicles would be made on just these two websites alone. Since staff estimates that the proposed regulation will necessitate the purchase of an additional 13,000 near-new used vehicles each year, and considering that California represents about 10 percent of the vehicle market, staff believes that there will be **sufficient** used vehicles to meet the demands of fleets to comply with the regulation. When one considers that this assessment didn't include vehicles that are available for sale each day at thousands of dealerships across the country, this assessment is highly conServative.

Beyond 2014, staff expects the incremental demand for replacement vehicles to decrease, reducing pressure on the used and new vehicle market to supply additional vehicles to California.

XII. PUBLIC OUTREACH

This chapter summarizes staff's efforts to ensure participation by all stakeholders in the development of the proposed regulation.

A. What outreach did staff do to inform the public about the regulation and solicit input on its development?

Since April 2006, as part of the public outreach process during the development of the proposed regulation, staff has continually notified affected industry and other interested parties regarding the proposed regulation, and solicited input regarding its development. The discussion below provides further details and Table XII-1 below summarizes the outreach efforts. As part of this process, staff has made significant changes to the proposed regulation at the request of stakeholders to improve clarity, provide flexibility and improve the effectiveness of the proposed regulation.

Table XII-1:. Summary of Outreach Efforts for the Proposed Regulation

Outreach Effort	Number,	Number and Description
Public Workshops	54	Workshops were held in 12 cities across the state between April 2006 and August 2007. Nine of the workshops were broadcast via the internet so stakeholders could participate remotely. Over 1,000 people attended at least one of the workshops.
Meetings and presentations	Over 100	Staff held over 100 individual meetings With companies and organizations to discuss the proposed regulation.
Individual Meetings	Over 50	Staff met with over 50 individual companies to discuss how the regulation would specifically impact their business operations.
Mailings and Letters	Over 300,000 mailings	Mailing sent to'all 300,000 registered diesel vehicle owners in December, 2007.

The first public workshops concerning development of the proposed regulation were held in April 2006. In total, staff hosted 54 public workshops in 12 different cities across the state including: Arvin, Berkeley, El Centro, El Monte, Fresno, Los Angeles, Oakland, Redding, Riverside Sacramento, San Diego, and San Jose. In many locations, both day and evening workshops were held to allow stakeholders to attend at their convenience and several workshops were broadcast via the internet to maximize participation.

Staff also held over 100 meetings with individual companies and organizations to discuss the proposed regulation. The meeting attendees ranged from just one company representative to over 100 attendees. This included over 50 meetings with individual companies to discuss specifically how the proposed regulation would impact their businesses and to gather additional information about their business operations. In

addition staff traveled to out-of-state locations to discuss and present the proposed regulation to fleet owners that travel through California.

In December, 2007, a mailing was sent to nearly 300,000 owners of registered diesel vehicles in California notifying them of the proposed regulation, how to participate in an online survey, and how to obtain additional information about staffs proposal. Staff also sent similar information via letters to diesel vehicle business owners in California, truck stops and repair facilities throughout the Western United States. This information also included a laminated fact sheet so that they could notify their customers of the proposed regulation. Staff also called and sent emails and letters to as many industry associations as could be identified who might have members affected by the proposed regulation. These included contractors associations, chambers of commerce, and organizations that represent engine manufacturers, equipment manufacturers, and drilling contractors.

To facilitate communication with stakeholders, an electronic listserve was created and regular notices were sent to it concerning regulation development. The email listserve for the regulation grew to over 3,400 members. An existing toll free phone number, 866-6DIESEL, was expanded to allow affected stakeholders to directly contact staff to obtain information about the proposed regulation and to receive assistance in completing the vehicle survey.

B. How Does the Proposed Regulation Address Environmental Justice Concerns?

As a matter of policy, ARB is committed to integrating environmental justice in all of its activities. The proposed regulation would require cleaner fleets of in-use on-road diesel vehicles to be used throughout the state, which would reduce emissions in all communities in California, including those with environmental justice concerns. Staff is currently working to inform those in environmental justice communities of the proposed regulation and how final implementation would reduce exposure to diesel PM and protect public health in their communities.

C. What outreach efforts are planned for implementation of the regulation?

If the proposed regulation is adopted, staff, in cooperation with affected industries, would develop and conduct an extensive outreach campaign to be sure affected parties are aware of their responsibilities under the regulation. Staff will outreach to fleets through current compliance activities for existing regulations, including through inspections at border crossings, California Highway Patrol (CHP) weigh stations, and fleet facilities. This campaign would also build on the outreach staff has already done throughout development of the proposed regulation including mailings to affected stakeholders and continued operation of the toll free 866-6DIESEL information line.

Staff will also continue to work with industry groups to inform their members about the regulation. Also, staff plans to track the implementation of the in-use off-road diesel vehicle regulation and use that effort as a model for outreach efforts for this regulation. This includes development of an electronic reporting system for early reporting and

planning of compliance scenarios. It also includes staff conducting training sessions throughout the state and developing guidance material and fact sheets for affected fleets. Staff also plans to form an advisory group representing fleets of all sizes and types, retrofit manufacturers and installers, consultants, engine manufacturers, and other affected industry groups. The overall mission of the advisory group would be to enhance outreach efforts, training and implementation materials for the regulation, and assist staff in being aware of needs of affected stakeholders and address specific issues.

XIII. IMPLEMENTATION AND ENFORCEMENT

It is ARB's policy to ensure uniform compliance with all its regulations so that no one entity obtains an unfair economic advantage by not complying with appropriate regulatory requirements. This chapter describes staff's planned effort to assist fleets in implementing the proposed regulation, and to uniformly enforce its requirements.

A. How would the regulation be implemented?

For the regulation to be fair to fleets that would spend considerable funds and effort to comply, fleets must be assured that their competitors would also be complying. For this to happen, there must be an effective outreach campaign and the regulation must be vigorously enforced. Staff recognizes that creating a level playing field for all affected fleets is important, and is committed to obtaining the resources necessary to do so.

If the proposed regulation is adopted, staff, in cooperation with affected industries would develop and conduct an extensive outreach campaign to be sure affected parties are aware of their responsibilities under the regulation. As stated above, staff will outreach to fleets through current enforcement activities for existing regulations including through inspections at border crossings, CHP weigh stations, and fleet facilities. This campaign would also build on the outreach staff has already done throughout development of the proposed regulation. First, staff would continue to work with industry groups to inform their members about the regulation. Second, as we have for our existing fleet rules for transit buses, public fleets, and off-road diesel vehicles, staff plans to hold training workshops **across** the state and invite engine manufacturers and manufacturers of verified diesel emission control systems to share information about their products with affected fleets. Third, staff would provide training and educational materials at the workshops and on our website to help fleets understand the choices they would face with respect to finding the most cost-effective path to compliance. Staff will also operate a toll-free number set-up to answer questions about the regulation (866-6DIESEL). Finally, staff would send electronic and hard-copy mailings to affected parties prior to the initial reporting dates in 2010 to inform fleet owners about their responsibility to report vehicles.

Staff also plans to develop and provide electronic tools for compliance planning that would allow fleets to determine what retrofits are available for their vehicles, and to experiment with various possible compliance paths. In addition, staff plans to develop and provide electronic reporting forms that would allow fleets to report their vehicles on-line and demonstrate how they would meet the requirements of the regulation. For fleets that prefer, staff would also be prepared to receive reports in non-electronic format.

B. How would the regulation be enforced?

Staff has the responsibility for enforcing the regulation. Enforcement of the rule will be conducted similarly to enforcement of ARB's commercial vehicle and school bus idling rules. ARB's enforcement staff will use the inspection and audit methods they have developed during their many years of experience **enforcing** the Heavy-Duty Vehicle Inspection Program (adopted into law in 1988) and the Periodic Smoke Inspection

Program (adopted into law in 1990). Enforcement activities will include inspections at border crossings, GHP weigh stations, fleet facilities, and randomly selected roadside locations, and audits of records. These activities could result in corrective actions and substantial civil penalties for non-compliance with the regulation.

The critical elements to the successful enforcement of the proposed regulation would be the annual reporting, if using the BACT percentage limits or the fleet averaging option, or vehicle inspections if the BACT option is used. Reporting will allow staff to initially determine whether fleets have either met the fleet average targets or complied with the BACT percentage limits requirements. Fleets would report each vehicle, its vehicle identification number (VIN), its engine data, its model year, as well as any actions taken to comply. For vehicles claiming one of the exemptions from the NO_x or PM requirements, owners will report the appropriate information such as miles driven, location where miles occurred, hours of use, and date of installation of technology.

ARB inspectors may use a variety of opportunities to find and inspect vehicles that are subject to the regulation. For example, they may conduct audits of fleets at facilities including but not limited to truck stops, weight stations, and temporary roadside inspection facilities. They may also inspect truck terminals at business facilities or at ports and rail stations. A search of California Highway Patrol's Biennial Inspection of Terminals' database may provide a way to target inspectors toward larger trucking terminals. They may also inspect vehicles at the border crossings where vehicles are routinely inspected for produce. Finally, inspections may be triggered if ARB receives reports from the public that indicate that certain vehicles has been observed with smoking exhaust or that a fleet is not in compliance with the rule. Complaints from the public via calls to the 1-800-END-SMOG toll-free line or on-line reporting trigger inspections or further enforcement action.

C. .What additional resources are needed for implementation and enforcement?

Additional staffing would be required to conduct implementation and outreach activities such as statewide training workshops, seminars, trade show presentations, and to table at conferences and expositions. Staff also anticipates an increase in requests for information and assistance, the development of compliance guidance documents and other tools to assist potential stakeholders with implementation. A web based regulatory tracking system for fleet reporting, enforcement verification purposes, and status reports on the rule's implementation would be required.

To ensure uniform compliance across the industry, guarantee no one entity obtains an unfair economic advantage by not complying with the requirements, and to achieve the emission reductions projected for the proposed regulations, enforcement activity will need to increase significantly. Subsequently, existing staffing levels will need to be increased to meet the increased demand for inspections and other enforcement activities, and ARB will need to augment its existing use of the CHP in its on-road enforcement efforts.

XIV. ALTERNATIVES CONSIDERED

Throughout the regulation development process, staff evaluated a number of suggested alternatives to the proposed regulation. This chapter provides a summary of the alternatives considered and the reasons they were not selected.

A. What alternatives to the regulation were considered, and why were they rejected in favor of the proposed regulation?

The alternatives considered by staff incorporated many recommendations from stakeholders such as special provisions for small fleets (3 or fewer vehicles), low use thresholds, agricultural vehicles, specialty or unique vehicles, vehicles that are operated exclusively in certain areas of the State, school buses, utility fleets, and credit for hybrid and alternative fuel vehicles:

However, staff did not accept all suggestions from stakeholders because in developing the regulation, staff was striving to achieve the following goals:

- Achieve the maximum, fastest possible, reductions in toxic PM emissions;
- Maximize NOx reductions to aid in attainment of federal air quality standards in the South Coast and San Joaquin Valley;
- Meet the State Implementation Plan emission reduction commitments;
- Minimize the costs for fleets and, in particular, minimize the frequency of fleets replacing existing vehicles with new vehicles;
- Achieve cost-effective emission reductions on a dollar per ton basis.

Staff sought to achieve these goals while keeping in mind the technology available today and likely to become available over the next decade. The alternatives considered and reasons they were rejected in favor of the proposed regulation are summarized in Table XIV-1 below

Table XIV-1: Alternatives Considered and Why They Were Rejected

Alternative Proposals	Why Rejected
PM Retrofit Only - Like previous diesel regulations, require fleets to phase-in a certain percent of PM retrofits per year until all vehicles are retrofit.	Would not achieve critically needed NOx reductions, including emission reductions needed to meet the State's SIP commitments in the San Joaquin and South Coast Air Basins.

Alternative Proposals

August 2007 ARB Staff Proposal- Require BACT on fleets in two phases. Phase 1 required engine to be 2004 model year and later with highest level verified PM DECS by end of 2012. Phase 2 required beginning in 2017, engines had to meet or exceed the emissions standards of a 2007 and later model year engine by the end of 2020. Fleet averaging option applied only to fleets that are registered to only operate in California.

January 2008 ARB Staff Proposal - Revised NOx and PM BACT requirements, more stringent fleet averaging provisions, and new special provisions for small fleets and specialty vehicles.

Street Sweeper Industry Proposal- Schedule for phasing out older sweeper vehicles through 2022. Provisions to exempt certain types of sweepers from existing diesel emission regulations that apply to the auxiliary engine on two-engine sweepers. Exempt sweeper fleet owners with two or fewer sweepers that do not sweep for hire or in a commercial capacity.

"Driving Toward A Cleaner California" Proposal - More generous mileage exemptions, early incentives, specialty vehicles provisions, a less aggressive compliance schedule for businesses subject to two or more ARB regulations, consideration of safety and compatibility issues, and, more flexible provisions if diesel emission control technology is not available. Would retain **the** same three compliance options in proposed regulation, but modify the compliance schedule and requirements.

Why Rejected

Would not provide the NOx emission reductions needed to meet the State's SIP commitments in the San Joaquin and South Coast Air Basins. Would not minimize costs to fleets, especially owner-operator type fleets or small fleets with three or fewer vehicles. It also did not minimize the need for engine or vehicle replacement.

While this would have maximized PM and NOx emission reductions in the San Joaquin and South Coast Air Basins, **and** would have achieved greater NOx emission reductions in 2014 than proposed regulation, it did optimize the rate of vehicle replacement, nor did it minimize the costs.

Would forgo a substantial percentage of PM and NOx emission reductions from these vehicles. Could also result in substantial loss in the anticipated risk reduction since sweepers frequently operate in urban areas, especially residential neighborhoods. Would also reduce the overall **emission** reductions needed from the proposed regulation to meet the state's SIP commitments in the San Joaquin Valley and South Coast air basins.

Would result in the loss of significant emission benefits resulting in a failure to meet SIP commitments to reduce NOx and PM in both the South Coast and San Joaquin Valley Air Basins.

The proposed regulation was chosen as the best structure to provide maximum flexibility for fleets to find their own, most cost-effective combination of retrofits, engine repowers, retirements, and accelerated vehicle replacements to comply with requirements of the proposed regulation. It also allows fleets to make decisions concerning which vehicles they plan to keep for a long time versus those that are not worth retrofitting or repowering and should be replaced. It also rewards fleets that comply early or use hybrid or alternative fuel technology. The proposed regulation also has special, less restrictive provisions for small fleets, low mileage and low use vehicles, vehicles operating in certain areas of the State, and agricultural and other specialty vehicles.

XV. REFERENCES.

ARB, 2000. California Air Resources Board. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October 2000.
<http://www.arb.ca.gov/diesel/documents/rrpapp.htm>

ARB, 2003a. California Air Resources Board. *Staff Report: Proposed Diesel Particulate Matter Control Measure For On-Road Heavy-Duty Residential and Commercial Solid Waste Collection Vehicles*. June 6, 2003.

ARB, 2003b. California Air Resources Board. *Staff Report: Airborne Toxic Control Measure for Stationary Compression-Ignition Engines*. September 2003.

ARB, 2004. California Air Resources Board. *Staff Report: Airborne Toxic Control Measure for Diesel-Fueled Portable Engines*. January 2004.

ARB, 2005a. California Air Resources Board. Review of the California Ambient Air Quality Standard for Ozone. Staff Report, Initial Statement of Reasons for Proposed Rulemaking. October, 2005 <http://www.arb.ca.gov/research/aags/ozone-rs/rev-staff/rev-staff.htm#Summary>

ARB, 2005b. California Air Resources Board. *"Hot Spots" Public Notification, District Prioritization Scores and Risk Threshold Values, Last Updated on August 25, 2005*.
<http://www.arb.ca.gov/ab2588/districtlevels.htm>

ARB, 2005c. California Air Resources Board: Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Adoption of the Proposed Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards. October 2005.
<http://www.arb.ca.gov/regact/cargo2005/isor.pdf>

ARB, 2005d. California Air Resources Board. *Staff Report: Proposed Diesel Particulate Matter Control Measure For On-Road Heavy-Duty Diesel-Fueled Vehicles Owned Or Operated By Public Agencies and Utilities*. October 25, 2005.
<http://www.arb.ca.gov/regact/dpmcm05/isor.pdf>

ARB, 2006. California Air Resources Board. *Environmental Tobacco Smoke: A Toxic Air Contaminant*. October 18, 2006. <ftp://ftp.arb.ca.gov/carbis/regact/ets2006/isor.pdf>

ARB, 2007a. California Air Resources Board. *Revised Draft Air Resources Board's Proposed State Strategy for California's 2007 State Implementation Plan*. Release Date: April 26, 2007. <http://www.arb.ca.gov/planning/sip/2007sip/2007sip.html>

ARB, 2007b. California Air Resources Board. *Staff Report: Proposed Regulation for In-Use Off-Road Diesel Vehicles*. April 2007.
<http://www.arb.ca.gov/regact/2007/ordiesl07/ordiesl07.htm>

· Commercialtrucktrader.com, 2008

Johnson Matthey, 2008. Press Release: Johnson Matthey Technology Enables World's Cleanest Class 8 Diesel Trucks to Hit the Road in Sacramento. March 26, 2008.
<http://ect.jmcatalysts.com/applications-trucksandbuses-news.php>

NCSA, 2007.· National Center for Statistics and Analysis. 2006 Traffic Safety Annual Assessment - A Preview. July 2007. <http://www-nrd.nhtsa.dot.gov/pubs/810791.pdf>

SCAQMD 2000, Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES-II), Final Report, Chapter 5. March, 2000)

Truckpaper.com, 2008

Ward's, 2007. Ward's Automotive Group. U.S. Truck Sales by GVW Class and Source, 2007, Copyright 2008. Subscription only service. <http://www.wardsauto.com>

XVI. LIST OF ACRONYMS

AQIP	Air Quality Improvement Program
AQMD	Air Quality Management District
ARB	Air Resources Board
ATCM	Airborne Toxic Control Measure
BACT	Best Available Control Technology
CAA	Clean Air Act
CCR	California Code of Regulations
CHP	California Highway Patrol
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CRT	Continuously Regenerating Trap
DECS	Diesel Emission Control Strategies
DPF	Diesel Particulate Filter
E-DRAM	Environmental-Dynamic Revenue Analysis Model
EMFAC2007	Emission Factors Model 2007
GSA	General Services Administration
GVWR	Gross Vehicle Weight Rating
HC	Hydrocarbon
HHD	Heavy heavy-duty vehicle
HSC	Health and Safety Code
IRP	International Registration Program
ISOR	Initial Statement of Reason (Staff Report)
LESB	Lower Emissions School Bus Program
MHO	Medium heavy-duty vehicle
NAAQS	National Ambient Air Quality Standard
NMHC	Non-Methane Hydrocarbons
NOx	Oxides of Nitrogen
OEHHA	Office of Environmental Health Hazard Assessment
PERP	Portable Equipment Registration Program
PM	Particulate Matter
PM10	Particles with diameter less than or equal to 10 microns
PM2.5	Particles up to 2.5 microns in diameter
RRP	(Diesel) Risk ,Reduction Program
SB 25	Senate Bill 25
SCR	Selective Catalytic Reduction
SCRT	Selective Catalytic Reduction & Trap
SIP	State Implementation Plans
SRP	Scientific Review Panel
TAC	Toxic Air Contaminants
TPD	Tons Per Day
U.S. EPA	United States Environmental Protection Agency
VIN	Vehicle Identification Number
VIUS	Vehicle Inventory and Use Survey

Appendix A

Proposed Regulation to Reduce Emissions from In-Use Diesel Vehicles

PROPOSED REGULATION ORDER

Adopt the following section of title 13, California Code of Regulations, to read as set forth in the following pages.

Section 2025. Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants, and Greenhouse Gases from In-Use Heavy Duty Diesel-Fueled Vehicles

Amend the following sections of title 13, California Code of Regulations, described in Appendix B.

Section 1956.8 Exhaust Emissions Standards and Test Procedures - 1985 and Subsequent Model Heavy-Duty Engines and Vehicles.

Section 2020. Purpose and Definitions of Diesel Particulate Matter Control Measures.

Section 2022 Diesel Particulate Matter Control Measure for Municipality or Utility On-road Heavy-duty Diesel-fueled Vehicles

Section 2022.1 Determining Compliance for a Municipality or Utility

Section 2027 In-Use On-Road Diesel-Fueled Heavy-Duty Drayage Trucks

Section 2449 General Requirements for In-Use Off-Road Diesel-Fueled Fleets

Section 2456 Portable Engine and Equipment Registration

Section 2479 Regulation for Mobile Cargo Handling Equipment at Port and Intermodal Rail Yards

Section 2485 Airborne Toxic Control Measure to Limit Diesel Fueled Commercial Motor Vehicle Idling

Amend the following sections of title 17, California Code of Regulations, to read as set forth in Appendix B.

Section 93116 Airborne Toxic Control Measure for Diesel Particulate Matter from Portable Engines Rated at 50 Horsepower and Greater

**DRAFT PROPOSED REGULATION TO REDUCE EMISSIONS OF
DIESEL PARTICULATE MATTER, AND OTHER POLLUTANTS
FROM IN-USE HEAVY-DUTY DIESEL-FUELED VEHICLES**

Adopt new section 2025, in title 13, article 4.5, chapter 1, California Code of Regulations (CCR) to read as follows: (Note that the entire text of section 2025 set forth below is new language proposed to be added to the California Code of Regulations.)

Section 2025. Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants, and Greenhouse Gases from In-Use Heavy-Duty Diesel-Fueled Vehicles

(a) *Purpose.*

The purpose of this regulation is to reduce emissions of diesel particulate matter (PM), oxides of nitrogen and other criteria pollutants, and greenhouse gases from in-use diesel-fueled vehicles.

(b) *Scope and Applicability.*

- (1) Except as provided in subsection (c), this regulation applies to any **person**, business, federal government agency, school district or school transportation provider that owns or operates, leases, or rents, affected vehicles that operate in California. The regulation also applies to persons that sell affected vehicles in California. Affected vehicles are those that operate on diesel-fuel, dual-fuel, or alternative diesel-fuel that are registered to be driven on public highways, were originally designed to be driven on public highways whether or not they are registered, yard trucks with off-road engines, both engines of two engine sweepers, schoolbuses, and have a manufacturer's gross vehicle weight rating (GVWR) greater than 14,000 pounds. Affected vehicles also include shuttle vehicles defined in section 2025(d)(63).

(c) *Exemptions*

This regulation does not apply to:

- (1) Vehicles subject to the solid waste collection vehicle rule commencing with title 13, CCR, section 2021;
- (2) On-road diesel-fueled heavy-duty vehicles over 14,000 pounds owned or operated by a municipality, that comply with the Best Available Control Technology (BACT) requirements of title 13, section 2022.1(a)(1);
- (3) Vehicles subject to the fleet rule for transit agencies commencing with title 13, CCR, section 2023;
- (4) Vehicles subject to the rule for mobile cargo handling equipment at ports and intermodal rail yards commencing with title 13, CCR, section 2479;
- (5) Military tactical support vehicles, as described in title 13, CCR, section 1905;

- (6) Authorized emergency vehicles as described in California Vehicle Code (Veh. Code), section 165;
- (7) **Off-road** vehicles subject to title 13, CCR, sections 2401, 2411, 2421, 2432, and 2449;
- (8) Dedicated snow-removal vehicles as defined in section 2025(d)(14)
- (9) Two-engine cranes as defined in title 13, CCR, section 2449(c)(56).
- (10) Historic vehicles as defined in section 2025(d)(35); and
- (11) Motor homes for non-commercial private use.

(d) *Definitions*

For purposes of this regulation, the following definitions apply:

- (1) *"2010 Model Year NOx Emissions Equivalent"* means:
 - (A) Emissions from an engine certified to the 2004 model year heavy-duty diesel engine emissions standard that is equipped with a verified diesel emission control strategy (VDECS) that reduces NOx exhaust emissions by more than 85 percent; or
 - (8) Emissions from an engine certified to the 2007 model year heavy-duty diesel engine emissions standard that is equipped with a VDECS that reduces' NOx exhaust emissions by more than 70 percent.
- (2) *"20Q7 Model Year NOx Emissions Equivalent"* means:
 - (A) Emissions from an engine certified to the 2003 or prior model year heavy-duty diesel engine emissions standard that is equipped with a VDECS that reduces NOx exhaust emissions by at least 70 percent; or
 - (8) Emissions from an engine certified to the 2004 through 2006 model year heavy-duty diesel engine emissions standard that is equipped with a VDECS that reduces NOx exhaust emissions by at least 40 percent; or
 - (C) Emissions from a 2004 model year NOx emissions equivalent heavy duty diesel engine, as defined in section 2025(d)(3)(A), that is equipped with a VDECS that reduces NOx exhaust emissions by at least 40 percent.
- (3) *"2004 Model Year NOx Emissions Equivalent"*
 - (A) Emissions from an engine certified to the 2003 or prior model year heavy duty diesel engine that was built to 2004 engine emission standards and was not used in any manufacturer's averaging, banking and trading program.
 - (8) Emissions from a pre-2004 model year heavy duty diesel engine that is equipped with a VDECS that reduces NOx exhaust emissions by at least 55 percent.
- (4) *"Agricultural Operations"* means:

- (A) The activity of growing or harvesting crops for the primary purpose of making a profit or providing a livelihood including any horticultural, viticultural, aquacultural, forestry, dairy, livestock, poultry, bee or farm product. Raising plants at nurseries that sell exclusively retail are not included, or
- (8) The cutting or removing of both of timber, other solid wood products, including Christmas trees, and biomass from forestlands for commercial purposes. The services also include all the work incidental thereto, including but not limited to, construction and maintenance of roads, fuel breaks, firebreaks, stream crossings, landings, skid trails, beds for falling trees, fire hazard abatement, and site preparation that involves disturbance of soil or burning of vegetation following forest removal activities. Forest operations include the cutting or removal of trees, tops, limbs and or brush which is processed into lumber and other wood products, and or for landscaping materials, or biomass for electrical power generation. Forest operations do not include conversion of forestlands to other land uses such as residential or commercial developments.
- (5) "Agricultural Vehicle" means;
- (A) An on-road vehicle that is required to display a hazardous material placard and exclusively delivers fertilizer or crop protection chemicals for use in agricultural operations from a distribution center to a farm, and is owned by a business holding a valid fertilizer or pest control license.
1. Owners of such vehicles must hold;
 - a. a valid pest control dealer license issued by the California Department of Pesticide Regulation as required under Food & Agricultural Code, Division 6, Chapter 7, Article 6, Section 12101 or,
 - b. a valid fertilizing materials license issued by the California Department of Food and Agriculture as required under Food & Agricultural Code, Division 7, Chapter 5, Article 4, Section 14591(a) and,
 2. Such vehicles must exclusively carry products defined under one of the following, and be required to display an appropriate **placard**, as required by the United States Department of Transportation:
 - a. 49 CFR, CHAPTER 1, PART 173.127 (Division 5.1), or
 - b. 49 CFR, CHAPTER 1, PART 173.132 (Division 6.1), or
 - c. 49 CFR, CHAPTER 1, PART 173.115 Class 2, (Division 2.1, 2.2, and 2.3),
 - d. 49 CFR, CHAPTER 1, PART 173.136 Class 8,
 - e. 49 CFR, CHAPTER 1, PART 173.140 Class 9.

- (8) A vehicle owned **by** a farming business, not operated for compensation, and used exclusively in agricultural operations. This includes supply trucks, cattle trucks, and other vehicles, but excludes vehicles that do not directly support farming operations such as personal use vehicles, vehicles rented or leased out, or vehicles used in a transportation business, or
 - (C) A vehicle not owned by a farming business that is exclusively **engaged** in agricultural operations. This includes manure spreaders, hay dispensing trucks, water trucks, bedding trucks and others, but excludes vehicles that supply any products, materials, personnel, or equipment to the farm except as allowed in (A) above, or
 - (D) A vehicle that exclusively transports any horticultural, viticultural, aquacultural, forestry, dairy, livestock, poultry, bee or farm products such as raw, unprocessed crops, livestock, fish, or fowl from the farm to the first point of processing after harvest.
- (6) *"Alternative Diesel Fuel"* means any fuel used in diesel engines that is not a reformulated diesel fuel as defined in sections 2281 and 2282 of title 13, CCR, and does not require engine or fuel system modifications for the engine to operate, other than minor modifications (e.g., recalibration of the engine fuel control) that may enhance performance. Examples of alternative diesel fuels include, but are not limited to, biodiesel, Fischer-Tropsch fuels, and emulsions of water in diesel fuel. Natural gas is not an alternative diesel fuel. An emission control strategy using a fuel additive will be treated as an alternative diesel fuel based strategy unless:
- (A) the additive is supplied to the engine fuel by an on-board dosing mechanism, or
 - (8) the additive is directly mixed into the base fuel inside the fuel tank of the engine, or
 - (C) the additive and base fuel are not mixed until engine fueling commences, and no more additive plus base fuel combination is mixed than required for a single fueling of a single engine or vehicle.
- (7) *"Alternative Fuel"* means natural gas, propane, ethanol, methanol, gasoline (when used in hybrid electric vehicles only), hydrogen, electricity, fuel cells, or advanced technologies that do not rely on diesel fuel. "Alternative fuel" also means any of these fuels used in combination with each other or in combination with other non-diesel fuels.
- (8) *"Alternative-Fueled Engine"* means an engine that is exclusively fueled with a fuel *meeting* the definition of alternative fuel.
- (9) *"Best Available Control Technology BACT Standard"* (BACT) means the exhaust PM and NOx standards that must be met according to the requirements of section 2025(f).

- (10) "*Commercial Vehicle*" means a motor vehicle or combination of motor vehicles as defined in California Veh. Code, section 260.
- (11) "*Common Ownership or Control*" means being owned or managed day to day by the same person, corporation, partnership, or association. Vehicles managed by the same directors, officers, or managers, or by corporations controlled by the same majority stockholders are considered to be under common ownership or control even if their title is held by different business entities. Common ownership or control of a federal government vehicle shall be the primary responsibility of the unit that is directly responsible for its day to day operational control.
- (12) "*Compliance Year*" means January 1 through December 31 of a calendar year.
- (13) "*Compression Ignition Engine*" means an internal combustion engine with operating characteristics significantly similar to the theoretical diesel combustion cycle. The regulation of power by controlling fuel supply in lieu of a throttle is indicative of a compression ignition engine'.
- (14) "*Dedicated Snow Removal Vehicle*" means a vehicle that has permanently affixed snow removal equipment such as a snow blower or auger and is operated exclusively to remove snow from public roads, private roads, or other paths to allow on-road vehicle access.
- (15) "*Diesel Fuel*" has the same meaning as defined in title 13, CCR, sections 2281 and 2282.
- (16) "*Diesel Particulate Filter*" means an emission control technology that reduces diesel particulate matter emissions by directing the exhaust through a filter that physically captures particles but permits gases to flow through. Periodically, the collected particles are either physically removed or oxidized (burned off) in a process called regeneration.
- (17) "*Diesel Particulate Matter (PM)*" means the particles found in the exhaust of diesel-fueled compression ignition engines. Diesel PM may agglomerate and adsorb other species to form structures of complex physical and chemical properties.
- (18) "*Diesel PM Index*" for the purposes of section 2025(h)(3)(B) means an indicator of the overall PM emission rate.
- (19) "*Diesel PM Target Rate*" means the diesel PM fleet average that a specific fleet must meet in a compliance year in order to show compliance with the fleet average requirements.
- (20) "*Drayage Truck*" is the same as defined in title 13, CCR. Section 2027.
- (21) "*Dual-Fuel Engine*" means any compression ignition engine that is engineered and designed to operate on a combination of alternative fuels, such as compressed natural gas (CNG) or liquefied petroleum gas (LPG) and diesel fuel or an alternative diesel fuel. These engines have two separate fuel systems, which inject both fuels simultaneously into the engine combustion chamber. A dual-fuel engine is not an alternative-fuel engine.
- (22) "*Electronic Tracking System*"

- (A) The tracking device must acquire date, time, and engine-on data at a minimum of 15 minute intervals, with no more than 30 minute data gaps. The tracking device must also acquire location data for vehicles claiming to operate exclusively in NOx-exempt areas and for vehicles that must document low use in California when their total miles of operation exceed 1,000 miles and total hours of operation exceed 100 hours.
- (B) The tracking records must be collected by an independent entity with no business relationship to the owners of the vehicles being tracked, other than to provide the tracking service.
- (23) *"Emergency Vehicle"* is as defined in California Veh. Code, section 27156.2.
- (24) *"Emergency Operation"* means operation of a vehicle to help alleviate an immediate threat to public health or safety. Examples of emergency operation include repairing or preventing damage to roads, buildings, terrain, and infrastructure as a result of an earthquake, flood, storm, fire, terrorism, or other infrequent act of nature. Emergency operation includes emergency support vehicle travel to and from an emergency event when dispatched by a governmental emergency management agency. Routine operation to prevent public health risks does not constitute emergency operation.
- (25) *"Emergency Support Vehicle"* means a vehicle that has been dispatched by a governmental emergency agency that is used to transport services or supplies in connection with an emergency operation.
- (26) *"Emission Factor"* means diesel PM or oxides of nitrogen (NOx) emission rate in grams per mile (*g/mile*) as shown in Appendix A. For engines that have been retrofit with VDECS, the PM Emission Factor is reduced by 50 percent for a level 2 VDECS, and 85 percent for a level 3 VDECS; the NOx Emission Factor is reduced by the percentage NOx emission reductions that are verified, if any. The PM Emission Factor is not reduced for a level 1 VDECS.
- (27) *"Executive Officer"* means the Executive Officer of the ARB or his or her authorized representative.
- (28) *"Farm"* means a physical location the primary purpose of which is making a profit or providing a livelihood from;
- (A) horticultural, viticultural, aquacultural, forestry or crops or plants that are grown and harvested at the location, (Nurseries that sell exclusively retail are not farms), or
- (B) raising, breeding, grazing, feeding, or milking animals, fish, fowl, or bees.
- (29) *"Farming Business"* means the cultivating, operating, or managing a farm for profit, either as owner or tenant. A farming business does not include businesses that derive their principal source of income from providing agricultural services such as soil preparation, veterinary, farm labor, or management for a fee or on a contract basis, or are engaged in the business of breeding, raising, and caring for dogs, cats, or other pet animals.

- (30) *"First Point of Processing"* means the location where harvested crops, bees, fowl, fish, livestock, animals, or their products are altered from their original state, packaged, or prepared for transportation. Such locations include, but are not limited to, packinghouses, slaughterhouses, cotton gins, nut hullers/shellers and processors, dehydrators, lumber mills, feed and grain mills, and biomass facilities located at a first processing facility, such as a saw mills, or biomass facilities that receive more than half of its waste in the form of unprocessed agricultural materials. First point of processing does not include locations where subsequent processing, canning, or similar activities occur.
- (31) *"Fleet"* means vehicles traveling in California that are subject to this regulation owned by a person, business, or government agency. A fleet consists of one or more vehicles.
- (A) *"Agricultural Fleet"* means a fleet utilizing the agricultural fleet provision in section 2025(1). A fleet owner utilizing the agricultural fleet provisions must include all vehicles under common ownership or control in the agricultural fleet including those vehicles that are not agricultural vehicles. Fleets not utilizing the agricultural fleet provision must comply with section 2025(e).
- (8) *"Federal Fleets"* means vehicles, in fleets owned by a department, agency, or instrumentality of the federal government of the United States of America and its departments, divisions, public corporations, or public agencies. With respect to the Department of Defense and its service branches, federal fleets may be managed regionally, locally, or a combination of regional and local management. There may be multiple federal fleets within a military service or an installation.
- (C) *"Rental or Leased Fleets"* means vehicles that are owned by a person (rental or leasing entity) for the purpose of renting or leasing, as defined in California Uniform Commercial Code, section 101 03(a)(1 0) such vehicles to other persons (renters or lessees) for use or operation.
1. Prior to the effective date of this regulation, vehicles subject to this regulation that are owned by a rental or leasing entity and rented or leased to the same renter or lessee for a duration of at least one year, are considered part of the fleet of the renter or lessee rather than the rental or leasing entity, unless the parties to the lease modify the terms of the rental or lease agreement in writing.
 2. After the effective date of this regulation, vehicles that are subsequently rented or leased by the rental or leasing entity to the same renter or lessee for a period of one year or more may be excluded from the rental or leasing entity's fleet and included in the fleet of the renter or lessee only if the written rental or lease agreement or amendment thereto specifically delineates such an arrangement.

3. Irrespective of the regulation's effective date, vehicles that are rented or leased for a period of less than one year must be included in the fleet of the rental or leasing entity.
 4. Unless the parties to a lease or rental agreement otherwise agree in writing, a vehicle leased or rented is considered part of the fleet of the rental or leasing entity if the written agreement prohibits the lessee or renter from modifying the leased or rented vehicle to comply with this regulation.
- (D) "*Fleet Size*" means the total number of vehicles under common ownership or control even if they are part of different subsidiaries, divisions, or other organizational structures of a company or agency.
- (E) "*Schoolbus Fleet*" means a fleet comprised only of vehicles that meet the definition of schoolbus given in section 2025(d)(62).
- (F) "*Schoolbus Sub-Fleet*" means the schoolbuses in a fleet comprised of schoolbuses and vehicles other than schoolbuses.
- (G) "*Small Fleet*" means a fleet with three or fewer vehicles. When determining fleet size, all of the vehicles under common ownership and control must be counted.
- (32) "*Heavy-Duty Pilot Ignition Engine*" means an engine designed to operate using an alternative fuel, except that diesel fuel is used for pilot ignition at an average ratio of no more than one part diesel fuel to ten parts total fuel on an energy equivalent basis. An engine that can operate or idle solely on diesel fuel at any time does not meet this definition.
- (33) "*Heavy Heavy-Duty Diesel Vehicle (HHD)*" for the purposes of this regulation, means a diesel motor vehicle having a manufacturer's gross vehicle weight rating greater than 33,000 pounds or a truck-tractor regardless of GVWR.
- (34) "*Highest Level VDECS*" means the highest level VDECS verified by ARB under its Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines (Verification Procedure), title 13, CCR, sections 2700-2710, for a specific engine as of 10 months prior to the compliance date, which the diesel emission-control strategy manufacturer and authorized diesel emission-control strategy dealer agree can be used on a specific engine and vehicle combination without jeopardizing the original engine warranty in effect at the time of application.
- (A) The highest level VDECS is determined solely on verified diesel PM reductions. Plus designations do not affect the diesel PM level assigned to a VDECS; that is, a level 3 Plus is the same diesel PM level as level 3.
 - (B) A level 2 VDECS shall not be considered the highest level VDECS as long as a level 3 VDECS can be retrofit on a vehicle in the fleet.
 - (C) Level 1 devices are never considered highest level VDECS for the purpose of this regulation.

- (35) *"Historic Vehicle"* means a vehicle that qualifies for a historical vehicle license plate pursuant to the California Veh. Code, section 5004, and is operated or moved over the highway primarily for the purpose of historical exhibition or other historic vehicle club activities.
- (36) *"Hybrid Vehicle"* means a vehicle that has a combination of an engine and onboard energy storage systems that provide for one or more of the following processes: motive power for starting the vehicle from a stop, motive power for accelerating the vehicle, recapture of energy when the vehicle decelerates. The energy storage systems can be electric, hydraulic, pneumatic or of any other type that recovers its energy directly or indirectly from the engine. In addition, the onboard energy storage systems of the hybrid vehicle can have the capability to supplement its energy from an external power source.
- (37) *"International Registration Plan (IRP)"* is a registration reciprocity agreement among states of the United States and provinces of Canada providing for payment of license fees on the basis of total distance operated in all jurisdictions.
- (38) *"Limited-Mileage Agricultural Vehicle"* means until January 1, 2017, an agricultural vehicle with a properly functioning odometer installed at all times, that operates less than the miles per calendar year specified below, based on the model year of the installed engine starting January 1, 2010:
- (A) A pre-1996 model year engine that is operated fewer than 15,000 miles; or
 - (B) A 1996 through 2005 model year engine that is operated fewer than 20,000 miles; or
 - (C) A 2006 or newer model year engine that is operated fewer than 25,000 miles.
- (39) *"Low-Mileage Agricultural Vehicle"* means until January 1, 2023, an agricultural vehicle that continuously operates less than 10,000 miles per calendar year starting January 1, 2010. From January 1, 2010, such vehicles must have a properly functioning odometer installed at all times.
- (40) *"Low-use Schoolbus"* means a schoolbus whose propulsion engine was operated in California for fewer than 1,000 miles during the preceding 12-month period from January 1 to the end of December. Such vehicles must have a properly functioning odometer installed at all times but are not required to have an hour-meter.
- (41) *"Low-use Vehicle"* means a vehicle whose propulsion engine was operated in California for fewer than 1,000 miles and less than 100 hours during the preceding 12-month period from January 1 to the end of December. Such vehicles must have a properly functioning odometer installed at all times.
- (42) *"Medium Heavy-Duty Diesel Vehicle (MHO)"* for the purposes of this regulation, means a diesel motor vehicle having a manufacturer's gross vehicle weight rating less than or equal to 33,000 pounds excluding truck-tractors regardless of GVWR.
- (43) *"Military Tactical Vehicle"* means a vehicle that meets military specifications, is owned by the U.S. Department of Defense and/or the U.S. military services or its

allies, and is used in combat, combat support, combat service support, tactical or relief operations or training for such operations.

- (44) *"Motor Carrier"* is the same as defined in California Veh. Code section 408 for fleets other than those that are comprised entirely of schoolbuses, which for the purposes of this regulation, means the registered owner, lessee, licensee, school district superintendent, or bailee of any schoolbus, who operates or directs the operation of any such bus on either a for-hire or not-for-hire basis.
- (45) *"Motor Home"* means a single vehicular unit designed for human habitation for recreational or emergency occupancy and built on, or permanently attached to, a self-propelled motor vehicle chassis, chassis cab, or van, which becomes an integral part of the completed vehicle.
- (46) *"New Fleet"* means a fleet that is acquired or that enters California after January 1, 2011. Such fleets may include new businesses or out-of-state businesses that bring vehicles into California for the first time after January 1, 2011.
- (47) *"Non-Commercial Use"* means any use or activity where a fee is not charged and the purpose is not the sale of a good or service, and the use or activity is not intended to produce a profit.
- (48) *"NOx BACT"* means an on-road engine newly manufactured in 2Q10 or later or a 2010 emissions-equivalent engine as defined in section 2025(d)(1) or a Tier 4 Final Engine.
- (49) *"NOx Exempt Areas"* are the following counties - Alpine, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Monterey, Plumas, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz, Shasta, Sierra, Siskiyou, Trinity, Tehama, and Yuba.
- (50) *"NOx Exempt Vehicle"* is any vehicle identified in this section in paragraphs (A) through (D) below that is exempt from the NOx performance requirements for the compliance years specified in section 2025(0).
- A NOx exempt vehicle is:
- (A) A schoolbus as defined in section 2025(d)(62); or
 - (B) A vehicle subject to this regulation that operates exclusively in the NOx exempt areas defined in section 2025(d)(49); or
 - (C) A vehicle subject to this regulation that is granted a compliance extension under the early action provision of section 2025(0)(7); or
 - (D) A NOx mileage exempt vehicle, as defined in section 2025(d)(52).
- (51) *"NOx Index"* for the purposes of section 2025(h)(2)(B) means an indicator of a fleet's overall NOx emission rate.
- (52) *"NOx Mileage Exempt Vehicle"* is exempt from the NOx performance requirements during the compliance years specified in section 2025(0),(1), and (h) regardless of where the vehicle is operated and is limited to:

- (A) A heavy heavy-duty diesel yard truck or other heavy heavy-duty diesel vehicle that has a power take off system to perform work in a stationary mode, that is operated fewer than 7,500 miles and less than 250 hours per year;
 - (8) A medium heavy-duty diesel yard truck or other medium heavy-duty diesel vehicle that has a power take off system to perform work in a stationary mode that is operated fewer than 5,000 miles and less than 175 hours per year;
 - (C) A heavy heavy-duty diesel vehicle that does not have a power take off system and does not perform work in a stationary mode and is operated fewer than 7,500 miles per year, with no hours limitation; or
 - (D) A medium heavy-duty diesel vehicle that does not have a power take off system and does not perform work in a stationary mode and is operated fewer than 5,000 miles per year, with no hours limitation.
- (53) "*NO_x Target Rate*" means the NO_x fleet average that a specific fleet must meet in a compliance year in order to show compliance with the fleet average requirements.
- (54) "*Oxides of Nitrogen (NO_x)*" means compounds of nitric oxide, nitrogen dioxide, and other oxides of nitrogen. Nitrogen oxides are typically created during combustion processes and are major contributors to smog formation and acid deposition, and to the formation of particulate matter.
- (55) "*Owner*" means either (A) the person registered as the owner or lessee of a vehicle by the California Department of Motor Vehicles (DMV), or its equivalent in another state, province, or country; or (8) a person shown by the registered owner to be legally responsible for the vehicle's maintenance. The person identified as the owner on the registration document or title carried on the vehicle at the time a citation is issued shall be deemed the owner unless that person demonstrates that another person is the owner of or legally responsible for the vehicle. Owners include persons listed on the registration document as the lessee of the vehicle. Owner also includes organizations within the federal government for vehicles not registered in any state or local jurisdiction and operated by a branch, agency or other department of the federal government. For the federal government, the owner shall be the entity required to maintain accountability for the vehicle or the organization that is shown by the accountable entity to be responsible for the vehicle's maintenance.
- (56) "*Person*" means an individual, corporation, business trust, estate, trust, partnership, limited liability company, association, joint venture, government, governmental subdivision, agency, or instrumentality, public corporation, or any other legal or commercial entity.
- (57) "*PM BACT*" means:
- (A) An engine equipped with the highest level VDECS for PM or an engine originally equipped with a diesel particulate filter.

- (B) From January 1, 2011 through January 1, 2017, the Executive Officer may annually grant a one-year extension of the compliance deadline based on the evaluation of information submitted pursuant to section 2025(q)(7) that a vehicle's engine cannot be equipped with the highest level VDECS for PM provided all other vehicles are in compliance with the PM BACT requirements of the compliance year.
- (C) By January 1, 2018, any vehicle that is not equipped with the highest level VDECS for PM must be replaced or have its engine replaced with one than can be equipped with the highest level VDECS for PM.
- (58) *"Governmental Agency"* means any federal, state, or local governmental agency, including, public schools, water districts, or any other entity with taxing authority.
- (59) *"Registered and Driven Safely On-Road"* means a vehicle that meets the requirements to be registered for on-road operation in California Veh. Code division 3, chap. 1, article 1, section 4000 et seq. (i.e., required to be registered or could be registered), and the requirements to be driven safely on-road in "Equipment of Vehicles" requirements in Veh. Code division 12, chap. 1, sections 24000 et seq. and "Size, Weight, and Load" requirements in Veh. Code division 15, sections 35000 et seq. or a vehicle defined as an implement of husbandry as defined in California Veh. Code division 16, chap. 1, section 36000 et seq.
- (60) *"Repower"* means to replace the engine in a vehicle with a newer engine certified to lower emission standards for PM or NOx or both as applicable.
- (61) *"Responsible Official"* means one of the following:
- (A) For a corporation: A president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, their delegate, designee, or any other person who performs similar policy or decision-making functions for the corporation;
 - (B) For a partnership or sole proprietorship: a general partner or the proprietor, respectively;
 - (C) For a municipality, state, federal, or other governmental agency: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of the U.S. EPA). For the purposes of the Department of Defense Military Services, a commanding officer of an installation, base or tenant organization.
- (62) *"Schoolbus"* is a motor vehicle as defined in California Veh. Code, section 545.
- (63) *"Shuttle vehicle"* means a diesel-powered motor vehicle of any gross vehicle weight rating with a capacity of 10 or more passengers, routinely driving an average of 10 trips per day to or from airport terminals, marine terminals, and rail based stations.

- (64) *"Specialty Agricultural Vehicle"* means, until January 1, 2023, certain types of agricultural vehicles having the following body types that have received confirmation by the Executive Officer that it will be treated as a specialty agricultural vehicle:
- (A) A nurse rig is a motor truck designed or modified to be used exclusively for the fueling, repairing, or loading of an airplane or helicopter used for the dusting, spraying, fertilizing, or seeding of crops;
 - (B) A cotton module mover which is a motortruck, or a truck tractor, in combination with a semitrailer, that is equipped with a self-loading bed and is designed and used exclusively to transport field manufactured cotton modules to a cotton gin;
 - (C) A vehicle equipped with a water tank owned by a farmer, not operated for compensation, and used exclusively in agricultural operations to provide dust suppression on dirt roads providing access to agricultural fields and for the transportation of water for crop or tree irrigation;
 - (D) A feed truck or mixer-feed truck, designed for dispensing food to livestock that is owned by a cattle or calf feedlot and exclusively used at such feedlot. Does not include a feed truck or mixer-feed truck used at other locations where cattle and calves exist such as dairies.
- (65) *"Three Day Pass"* means a fleet may operate a vehicle for single three day period each year in California without meeting the requirements of section 2025(e) provided that prior to entering California the vehicle owner has reported the information in section 2025(q)(3) and (q)(4) and the date the vehicle will be entering California.
- (66) *"Tier 0 Engine"* means an engine not subject to the requirements in title 13, CCR, section 2423; Title 40, Code of Federal Regulations (CFR), Part 89; or Title 40, CFR, Part 1039.
- (67) *"Tier 4 Final Engine"* means an engine subject to the final after-treatment-based Tier 4 emission standards in title 13, CCR, section 2423(b)(1)(B) and/or Title 40, CFR, Part 1039.101. This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 4 FEL listed in title 13, CCR, section 2423(b)(2)(B) and/or Title 40, CFR, Part 1039.101
- (68) *"Truck-Tractor"* means a motor vehicle with a driver's cab and an engine, fitted with a coupling at the rear known as a fifth-wheel, and designed to pull a large trailer or semi-trailer on the open highway. Is also known as a bobtail.
- (69) *"Unique Vehicle"* means a vehicle for which:
- (A) a used vehicle that performs a similar function with a 2007 NOx equivalent emissions engine or cleaner is not available, and
 - (B) a suitable cab and chassis upon which the truck bed could be mount is not available, and

(C) a verified NOx emissions control device that could reduce the vehicle's exhaust NOx emissions is either installed or not available, and

(D) the vehicle's engine is equipped with the highest level VDECS.

(70) "*Utility*" is the same as defined in title 13, CCR, section 2022(b).

(71) "*Verified Diesel Emission Control Strategy*" (VDECS) means an emissions control strategy, designed primarily for the reduction of diesel PM emissions, which has been verified pursuant to the Verification Procedures. VDECS can be verified to achieve level 1 diesel PM reductions (25 percent), level 2 diesel PM reductions (50 percent), or level 3 diesel PM reductions (85 percent). VDECS may also be verified to achieve NOx reductions. See also definition of Highest Level VDECS.

(72) "*VDECS Failure*" means the condition of not achieving the emissions reductions to which the VDECS is verified. Such condition could be due to inappropriate installation, damage, or deterioration during use. If a level 3 VDECS is emitting visible smoke, it is assumed to have failed.

(73) "*Yard Truck*" means a vehicle, with an on-road or off-road engine that is specifically designed to move trailers around freight yards. Yard trucks are also known as yard goats, yard dogs, trailer spotters or jockeys.

(e) *Performance Requirements*

Beginning with the applicable effective dates, a **fleet** owner must comply with the following requirements of this regulation:

- (1) The fleet owner must comply with the best available control technology (BACT) requirements of section 2025(f) or the BACT percentage limits of section 2025(g) or the fleet average requirements of section 2025(h). The compliance option need not be the same for each pollutant. The fleet owner may also opt to comply with the early compliance provision of section 2025(0)(7)
- (2) Schoolbus fleets, as defined in section 2025(d)(31)(E), must comply with the performance requirements of section 2025(j) and are exempt from NOx performance requirements as provided therein.
- (3) Each fleet that includes schoolbuses and other vehicles must meet the following requirements:
 - (A) The schoolbus sub-fleet as defined in section 2025(d)(31)(F) must meet the requirements of section 2025(j).
 - (B) The remaining vehicles, excluding the schoolbus sub-fleet, must comply with the performance requirements of section 2025(e)(1) above; or the *owner* may include the schoolbus sub-fleet in the determination of compliance with the performance requirements of section 2025(e)(1). Schoolbuses used in this determination are still exempt from the NOx performance requirements. However, the owner may not use non-schoolbus vehicles to satisfy the schoolbus sub-fleet requirements of section 2025(j).

(f) *Best Available Control Technology (BACT) Requirements*

Starting January 1, 2011, a fleet owner who elects to utilize the provisions of section 2025(f) to comply with either the PM BACT, NOx BACT, or both requirements must

meet the applicable requirements set forth in sections (d) (57) or (48) for each vehicle within its fleet in accordance with the compliance schedule shown in Table 1. Each year the fleet must meet the requirements of all prior years on the schedule.

Table 1: Best Available Control Technology Compliance Schedule

<i>Compliance Deadline, as of January 1</i>	<i>Engine Model Years</i>	<i>BACT Requirements</i>
2011	Pre-1994	PM BACT
2012	2003 -2004	PM BACT
2013	2005 - 2006	PM BACT
	1994 -1999	NOx and PM BACT
2014	2000 -2002	NOx and PM BACT
	All other model years	PM BACT
2015	Pre-1994	NOx and PM BACT
2016	2003 - 2004	NOx and PM BACT
2017	2005 -2006	NOx and PM BACT
2018	All pre-2007	NOx and PM BACT
2019	All pre-2007	NOx and PM BACT
2020	All pre-2007	NOx and PM BACT
2021	2007 or equivalent	NOx and PM BACT
2022	2008	NOx and PM BACT
2023	2009-	NOx and PM BACT

(g) *BACT Percentage Limits.*

- (1) A fleet owner who elects to utilize the provisions of section 2025(g) for PM, NOx, or both must comply with the applicable performance requirements in sections (g)(2), (3), and (4) below and the reporting requirements of section 2025(q).
- (2) By January 1 of each compliance year, the fleet must meet PM BACT for the **percentage** of propulsion engines in the fleet as set forth in Table 2.
- (3) By January 1 of each compliance year, the fleet must meet NOx BACT for the percentage of engines in the fleet as set forth in Table 2.
- (4) If the calculated number of engines in each model year group required to be brought into compliance with the BACT percentage limits is not equal to a whole number, the owner shall round up to a whole number when the fractional part of the required number of engines is equal to or greater than 0.5, and round down if less than 0.5.

Table 2: Percent of Total Fleet That Must Comply with PM and NOx BACT

Compliance Deadline as of January 1	Percent of Total Fleet Complying with BACT	
	PM BACT	NOx BACT
2011	25%	NA
2012	50%	NA
2013	75%	25%
2014	100%	50%
2015	100%	50%
2016	100%	60%
2017	100%	80%
2018	100%	80%
2019	100%	80%
2020	100%	90%
2021	100%	90%
2022	100%	90%
2023	100%	100%

(h) *Fleet Averaging Option*

(1) A fleet owner **who** elects to be subject to provisions of section 2025(h) for compliance with the fleet average requirement for PM, NOx, or both must comply with the applicable fleet averaging requirements of sections (h)(2) and (3) below and the reporting requirements of section 2025(q).

(2) *NOx Fleet Average.*

(A) A fleet owner must demonstrate that on January 1 of each compliance year, starting in 2013 and ending on January 1, 2023, the calculated NOx Index of the applicable portion of the fleet was less than or equal to the calculated NOx Target Rate.

NOx exempt vehicles, as defined in section 2025(d)(50), need not be included in the calculation of the NOx Index or the NOx fleet average for those years that the vehicle is exempt.

(B) *NOx Index:* The following equation is to be used to calculate the NOx Index.

$$\text{NOx Index} = \frac{\text{Sum of EF(HHD)} + \text{Sum of EF(MHD)}}{\text{Total number of vehicles subject to the NOx requirements}}$$

Where:

EF(HHD) = The NOx emission factor as specified in Appendix A for each heavy heavy duty (HHD) vehicle subject to the NOx requirements, or adjusted as applicable according to paragraphs 1. and 2. below.

EF(MHD) = The NOx emission factor as defined in Appendix A for each medium heavy duty (MHO) vehicle subject to the NOx requirements, or adjusted as applicable, according to paragraphs 1. and 2. below.

1. For engines that have been retrofit with VOECS, the NOx emission factor is reduced by the percentage NOx emission reductions that are verified.
2. The fleet owner may exclude 2010 model year engines equipped with a diesel particulate filter (OPF) from the fleet average calculation for any compliance year, and may exclude 2007 model year engines equipped with a OPF from the fleet average calculation through January 1, 2013.

(C) *NOx Target Rate*: The following equation is to be used to calculate the NOx Target Rate.

$$\text{NOx Target Rate} = \frac{\text{Sum of Target(HHD)} + \text{Sum of Target(MHD)}}{\text{Total number of vehicles subject to the NOx requirements}}$$

Where:

Target(HHD) = The NOx target from Table 3 for each HHO vehicle subject to the NOx requirements.

Target(MHD) = The NOx target from Table 3 for each MHO vehicle subject to the NOx requirements.

*Table 3: Fleet NOx Targets
to be Used to Calculate NOx Target Rates (g/mile)*

<i>Compliance Deadline, as of January 1</i>	<i>Fleet NOx Targets for each compliance deadline</i>	
	MHO	HHO
2013	8.5	14.4
2014	5.8	9.8
2015	5.8	9.8
2016	4.6	7.8
2017	4.0	6.0
2018	4.0	6.0
2019	4.0	6.0
2020	3.2	4.4
2021	3.2	4.4
2022	1.6	3.0
2023	0.8	1.6

(3) *PM Fleet Average.*

(A) A fleet owner must demonstrate that on January 1 of each year, starting in 2011 and ending on January 1, 2023, the PM Index of the applicable portion of the fleet was less than or equal to the calculated PM Target Rate.

(8) *PM Index.* The following equation is to be used to calculate the PM Index:

$$PM\ Index = \frac{Sum\ of\ PMEF\{HHD\} + Sum\ of\ PMEF\{MHD\}}{Total\ number\ of\ vehicles\ subject\ to\ the\ PM\ fleet\ averaging\ requirement}$$

Where:

PMEF{HHD} = The PM emission factor (g/mile) as specified in Appendix A for each heavy heavy duty (HHO) vehicle or adjusted according to paragraph 1. below, as applicable.

PMEF{MHD} = The PM emission factor (g/mile) as specified in Appendix A for each medium heavy duty (MHO) vehicle or adjusted as applicable according to paragraph 1. below.

1. For an engine that has been retrofit with a VOECS, the PM Emission Factor is reduced 50 percent for a level 2 VOECS, and 85 percent for a level 3 VOECS; the PM Emission Factor is not reduced for a level 1 VOECS

(C) *PM Target Rate:* The following equation is to be used to calculate the PM Target Rate

$$PM\ Target\ Rate = \frac{Sum\ of\ PMTarget\{HHD\} + Sum\ of\ PM\ Target\{MHD\}}{Total\ number\ of\ vehicles\ subject\ to\ the\ PM\ fleet\ averaging\ requirement}$$

Where:

PMTarget{HHD} = The PM target (*g/mile*) from Table 4 for each HHO vehicle subject to the PM fleet averaging requirements.

PMTarget{MHD} = The PM target (*g/mile*) from Table 4 for each MHO vehicle subject to the PM fleet averaging requirements.

*Table 4: Fleet PM Targets
to be Used to Calculate PM Target Rates (g/mile)*

<i>Compliance Deadline, as of January 1</i>	<i>Fleet PM Targets for each compliance deadline</i>	
	MHO	HHO
2011	0.38	0.710
2012	0.29	0.530
2013	0.17	0.320
2014	0.06	0.110
2015	0.06	0.110
2016	0.06	0.110
2017	0.06	0.110
2018	0.06	0.110
2019	0.06	0.110
2020	0.06	0.110
2021	0.06	0.110
2022	0.06	0.110
2023	0.06	0.110

(i) *Optional Requirements for Small Fleets*

Small fleet owners that elect to comply with either section 2025«i)(1) or section 2025(i)(2) below will be subject to the reporting requirements of section 2025(q).

In lieu of the performance requirements of sections 2025(e) through (h), the owner *ota* small fleet may comply by having the following:

(1) *Fleets with One Vehicle*

A vehicle with a 2004 model year NOx emissions equivalent or newer engine equipped with the highest level VDECS for reducing PM emissions by January 1, 2013. This vehicle would not be subject to being replaced- until January 1,2018. -

(2) *Fleets with Two Vehicles*

(A) One vehicle with a 2004 model year **NOx** emissions equivalent or newer engine equipped with the highest level VDECS by January 1, 2013. This vehicle would not be subject to being replaced until January 1, 2018.

(8) The other vehicle must meet the requirements of section 2025(f) by January 1, 2014.

(3) *Fleets with Three Vehicles*

(A) One vehicle with a 2004 model year NOx emissions equivalent or newer engine equipped with the highest level VDECS by January 1, 2013. This vehicle would not be subject to being replaced until January 1, 2018.

- (B) The other vehicles must meet the requirements of section 2025(f) by January 1, 2014 or
- (C) If by January 1, 2014, the second vehicle is equipped with a 2010 model year emissions equivalent or newer engine, the third vehicle is exempt from the PM and NOx performance requirements of section 2025(e) until January 1, 2016 when it must meet the requirements of 2025(e).

(j) *Requirements for School/buses*

Beginning with the applicable effective dates set forth below, a schoolbus fleet, as defined in section 2025(d)(31)(E), and a schoolbus sub-fleet as defined in section 2025(d)(31)(F) must comply with the following requirements of this regulation.

- (1) Any schoolbus manufactured before April 1, 1977, must be retired from service no later than January 1, 2012.
- (2) Each schoolbus fleet or **schoolbus** sub-fleet must comply with the best available control technology (BACT) requirements of section 2025(j)(4) or the PM BACT percentage limit requirements of 2025(g) or the PM fleet averaging option of 2025(h)(3).
- (3) By January 1, 2014, all diesel-fueled schoolbuses shall be retrofit with the highest level VDECS available to be used on any engine used in schoolbuses regardless of the compliance option chosen. Engines equipped with a diesel particulate filter by the engine manufacturer as original equipment are considered in compliance with this requirement.
- (4) Each schoolbus fleet or schoolbus sub-fleet owner who chooses the BACT option must meet the PM BACT as defined in section 2025(d)(57) according to the compliance schedule shown in Table 5.
- (5) If a schoolbus engine cannot be retrofit with highest level VDECS for PM then the engine shall be replaced with an engine that can be retrofit with the highest level VDECS by January 1, 2018. The schoolbus must be included in the compliance method calculation described in section 2025(j)(2) and the reporting and record requirements in section 2025(j)(9).
- (6) After a **schoolbus** has been retrofit with a VDECS, it must receive a safety inspection from an authorized employee of the department of the California Highway Patrol, as required by title 13, California Code of Regulations (CCR) section 1272(c), prior to its return to service.

Table 5: Best Available Control Technology Compliance Schedule for Schoolbus Fleets

<i>Compliance Deadline, as of January 1</i>	<i>Engine Model Years</i>
2011	2000 and newer
2012	1994 - 1999
2013	1987 - 1993
2014	Pre-1987

(7) *Special Provisions for Schoolbuses*

(A) An owner of a schoolbus fleet or schoolbus sub-fleet may be granted credit for hybrid schoolbuses or alternative fuel schoolbuses according to the provisions of sections 2025(0)(8) and (9), respectively.

(B) *Low-use Schoolbuses*

1. Schoolbuses that meet the definition of a low-use schoolbus are, exempt from the performance requirements of section 2025(j)(2) but the owner must keep records and meet the reporting requirements in accordance with sections 2025(j)(9) and (10).
2. Low-use schoolbuses need not be included when determining compliance with the BACT percent limits of section 2025(g) or when calculating PM fleet average indices or target rates for the fleet averaging option of section 2025(h)(3).
3. Schoolbuses that formerly met the low-use schoolbus definition, but for which mileage subsequently increases to 1,000 miles or greater, must immediately meet the performance requirements of section 2025(f), or (g) or (h) as required for the immediately preceding compliance deadline.

(C) Schoolbuses that were retrofit on or before December 31, 2005 with a level 2 VDECS, which was highest level VDECS at the time of installation, are considered in compliance with this requirement.

(8) Schoolbuses registered as historic vehicles, as defined in section 2025(d)(35) are not subject to the regulation.

(9) *Reporting Requirements for Schoolbus Fleets and Schoolbus Sub-Fleets*

(A) The owner of a schoolbus fleet or a schoolbus sub-fleet is subject to the reporting requirements in subsection (B) below if complying with the PM BACT percentage limit requirements of 2025(g) or the PM fleet averaging option of 2025(h)(3) or any of the special provision's in section 2025(0).

(B) From January 1, 2011 through January 1, 2014, the schoolbus fleet owner must report the information required in section 2025(q), except for the information required under subsections 2025(q)(8)(C), 2025(q)(8)(E) or (q)(11)(C).

(10) *Record Keeping Requirements for Schoolbus Fleets and Schoolbus Sub-Fleets*

The owner of a schoolbus fleet or a schoolbus sub-fleet shall maintain copies of the information reported under section 2025(j)(9) and the records specified in section 2025(r) as applicable.

- (11) Schoolbus fleets and schoolbus sub-fleets are subject to the applicable requirements of sections 2025(s) through (y).

(k) *Requirements for Drayage Trucks and Utility Vehicles*

- (1) A drayage truck as defined in section 2025(d)(20), with a 2004 model year engine must be equipped with the highest level VDECS for PM by January 1, 2012 and a 2005-2006 model year engine must be equipped with the highest level VDECS for PM by January 1, 2013.
- (2) Starting in January 1, 2021, all drayage truck and utility vehicle owners must comply with the BACT requirements of section 2025(f).

(l) *Requirements for Agricultural Fleets*

- (1) Beginning January 1, 2011, vehicles meeting the definitions of limited-mileage agricultural vehicles, or low-mileage agricultural vehicles, shall be exempt from the performance requirements of sections 2025(f), (g), and (h) for the periods specified in the definitions, provided that such vehicles meet the conditions set forth below. Provisions for specialty agricultural vehicles, as defined in section 2025(d)(64), are provided below. To qualify for any of these provisions, such vehicles must be operational and functional, including being able to start without *assistance* and able to move under its own power. Vehicles that are being used for parts are not included in these provisions.
- (2) For all other vehicles in the agricultural fleet, beginning January 1, 2011, the fleet owner must comply with the best available control technology (BACT) requirements of section 2025(f) or the fleet average requirements of section 2025(h).
- (3) Agricultural fleet **owners** must report and comply with the **requirements** of section 2025(q) and 2025(r) for all of their vehicles, regardless of whether the vehicle is an agricultural vehicle or not.
- (4) Within 30 days of replacing a low-mileage, limited-mileage, or specialty agricultural vehicle, the agricultural fleet owner must report the required information in section 2025(q)(9)(E).
- (5) All vehicles must comply with the requirements of section 2025(e) for the next compliance date upon it being discovered that any vehicle in the agricultural fleet does not comply with any of the requirements of this agricultural fleet provision.
- (6) Requirements for limited-mileage agricultural vehicles
- (A) The maximum number of limited-mileage agricultural vehicles in any agricultural fleet shall be established by the number of **limited-mileage**

vehicles in the agricultural fleet as of January 1, 2009, as reported in section 2025(q)(9). This number shall not increase.

- (B) A limited-mileage agricultural vehicle may be replaced by another vehicle so long as the replacement vehicle is equipped with an engine that is at least one model year newer than the engine in the vehicle it replaced, and provided the original vehicle is scrapped, rendered inoperable, or sold out of the agricultural fleet. This requirement does not apply to engine replacements.
 - (C) When a limited-mileage agricultural vehicle is replaced, the sum of the miles accrued on the original vehicle in that calendar year, up to the time of replacement, plus the mileage accrued on the replacement vehicle for the remainder of the calendar year (beginning with the date of replacement) must remain below the mileage thresholds established in section 2025(d)(38) based on the model year of the engine in the replacement vehicle.
 - (D) Beginning January 1, 2017, all limited-mileage agricultural vehicles must comply with the best available control technology (BACT) requirements of section 2025(f) or the fleet average requirements of section 2025(h).
 - (E) A vehicle that formerly met the limited-mileage agricultural vehicle definition, but whose use increases above the mileage thresholds established in section 2025(d)(38) based on the model year of the engine, must immediately meet the performance requirements of section 2025(f) or (h) for the immediately preceding compliance deadline.
 - 1. In addition, the vehicle may not be replaced and the number of limited-mileage agricultural vehicles in the agricultural fleet, as established in section 2025(1)(6)(A) above, shall be reduced by one.
 - (F) A merger of two or more agricultural fleets having designated limited mileage vehicles may not result in more designated limited mileage vehicles after the merger occurs than the sum of the total limited mileage vehicles from **each** individual agricultural fleet included in the merger.
- (7) Requirements for low-mileage agricultural vehicles
- (A) The maximum number of low-mileage agricultural vehicles in each agricultural fleet shall be established by the number of low-mileage vehicles in the agricultural fleet as of January 1, 2009, as reported in section 2025(q)(9). This number shall not increase.
 - (B) A low-mileage agricultural vehicle may be replaced with another vehicle if the replacement vehicle is equipped with an engine that is at least one model year newer than the engine in the vehicle being replaced, and provided the original vehicle is scrapped, rendered inoperable, or sold out of the agricultural fleet. This requirement does apply to engine replacements.

- (C) When a low-mileage agricultural vehicle is replaced, the sum of the miles accrued on the original vehicle in that calendar year, up to the time of replacement, plus the mileage accrued on the replacement vehicle for the remainder of the calendar year (beginning with the date of replacement) must remain below the mileage threshold established in section 2025(d)(39).
 - (D) Beginning January 1, 2023, all low-mileage agricultural vehicles must comply with the best available control technology (BACT) requirements of section 2025(f).
 - (E) Irrespective of section 2025(1)(5)(a), until January 1, 2017, a vehicle that formerly met the low-mileage agricultural vehicle definition, but whose use increases above the mileage thresholds established in section 2025(d)(38) based on the model year of the engine, must immediately meet the performance requirements of section 2025(f) or (h) for the immediately preceding compliance deadline. The vehicle may not be replaced in the future with a substitute low-mileage agricultural vehicle, and the number of low-mileage agricultural vehicles in the agricultural fleet, as established in section 2025(1)(1) above, shall be reduced by one.
 - (F) A merger of two or more agricultural fleets having designated low-mileage vehicles may not result in more designated low-mileage vehicles after the merger occurs than the sum of the total low-mileage vehicles from each individual agricultural fleet included in the merger.
 - (G) Until January 1, 2017, an agricultural fleet owner may change the status of a low-mileage vehicle to a limited-mileage vehicle provided the vehicle continues to meet the definition of a limited-mileage vehicle. The low-mileage vehicle may not be replaced and the number of low-mileage agricultural vehicles in the agricultural fleet, as established in section 2025(1)(7)(A) above, shall be **reduced** by one
- (8) Requirements for specialty agricultural vehicles
- (A) Specialty agricultural vehicles, as defined in section 2025(d)(64), are exempt from the performance requirements of sections 2025(f), (g), and (h) until January 1, 2023.
 - (B) The Executive Officer will approve a vehicle as qualifying as a specialty agricultural vehicle under the following conditions:
 1. The total number of specialty agricultural vehicles in the San Joaquin Valley Air Basin does not exceed 1,100, and
 2. The total number of specialty agricultural vehicles in the state does not exceed 2,200.
 - (C) All vehicles with the body types described in section 2025(d)(64) that have not been approved must meet the requirements of section 2025(f).

1. In such an instance, the agricultural fleet operator shall be notified in writing by the Executive Officer that the reported vehicle is not eligible as a specialty agricultural vehicle.

(9) Labeling Requirements for Agricultural Vehicles

(A) Within thirty days of the reporting date, fleet owners must permanently affix or paint an AG identification label on each low-mileage, limited-mileage, and specialty agricultural in the fleet according to the following specification:

1. The letters AG shall be black on a **white** background. Both letters shall be at least three inches high on a five by eight inch background,
2. The label shall be located in clear view on the left and right door of the vehicle.

(m) *Requirements for Two-Engine Sweepers*

- (1) Two-engine sweepers must comply with section 2025(e) and install the highest level VDEC on the auxiliary engine of the sweeper when the propulsion engine is required to meet the PM BACT as defined in section 2025(d) (57) or when the vehicle is used to meet the requirements of section 2025(g) or 2025(h).
- (2) Two-engine sweepers may not operate any Tier 0 auxiliary engine more than 250 hours per year starting January 1, 2010 until January 1, 2014 and 100 hours per year thereafter.
- (3) Labeling Requirements for Two-Engine Sweepers with Tier 0 Auxiliary Engines

(A) Within 30 days of the reporting date, fleet owners must permanently affix or paint an SW identification label on each two engine sweeper in the fleet if using BACT percentage limits or fleet averaging upon reporting. An SW identification label must be in clear view on left and right door according to the following specification:

(B) The letters SW shall be black on a white background. Both letters shall be at least three inches high on a five by eight inch background.

(n) *Requirements for a New Fleet and Adding Vehicles to a Fleet.*

- (1) *New Fleet Requirements.* Owners of new fleets must meet the requirements of section 2025(e) and sections 2025(1), (g), or (h) as applicable, immediately upon purchasing vehicles subject to the regulation or bringing such vehicles into the State of California for the first time after January 1, 2011. New fleets meeting the requirements of sections 2025(g) or (h) must report vehicles subject to the regulation to ARB within 30 days of purchasing or bringing such vehicles into the State, in accordance with the requirements in section 2025(q).
- (2) *Adding Vehicles to a Fleet.* If a fleet does not meet the BACT requirements of section 2025(1), before the fleet may operate a newly added vehicle in California, it must within 30 days of adding the vehicle file a report with the Executive Officer

that it has added a new vehicle, and demonstrate that the fleet, as newly constituted, complies with the requirements of sections 2025(n)(2)(A) and (B) below.

- (A) A fleet owner who elects to utilize the BACT percentage limits option of section 2025(g) may not add vehicles that cause the percentage calculated for the fleet to fall below the percentage required for the previous compliance date.
- (B) A fleet owner who elects to utilize the fleet averaging requirements of section 2025(h) may not add vehicles that cause the fleet to exceed the **fleet** average target rates for the immediately preceding compliance deadline.

(0) *Exemptions, Compliance Extensions, and Credits.*

A fleet owner may be granted an extension to a compliance deadline if:

- (1) *Exemption from NOx Performance Requirements.* Upon providing documentation demonstrating compliance with the conditions listed below in paragraphs (A) through (C), the Executive Officer will exempt the vehicles identified in those paragraphs from the NOx performance requirements of sections 2025(f), (g), or (h). If an exemption is **granted**, all such vehicles affected will continue to be subject to the PM performance requirements of section 2025(f), (g), or (h) and the record keeping and reporting requirements of this regulation.

- (A) A vehicle that meets the definition of NOx mileage exempt vehicle, as defined in section (d)(52), prior to January 1, 2021.

If a vehicle is used both for emergency operations, as defined in section 2025(d)(24), and for other purposes, the owner does not need to consider the hours of operation or the mileage the vehicle accrues when used for emergency operations in a compliance year, in determining whether the vehicle meets the definition of a NOx mileage exempt vehicle for that compliance year.

- (B) A vehicle that operates solely in the NOx exempt areas defined in section (d)(49) prior to January 1, 2021. A NOx-exempt vehicle is allowed to travel outside of the NOx-exempt area only for repairs or other service to the vehicle. The **vehicle** owner must obtain a work order from the facility that describes the service and shows the date of the service and location of the facility.

- (C) Schoolbuses as defined in section 2025(d)(62).

- (2) *Exemption for Cab-Over-Engine Truck Tractors.* Upon providing documentation demonstrating compliance with the conditions listed below in paragraphs (A) through (E), the Executive Officer will not require the type of vehicle listed in paragraph (A) to be replaced in order to meet the fleet's NOx performance requirements prior to January 1, 2018:

- (A) The vehicle **is** a truck-tractor where the cab **sits** over the engine on the **chassis** and it **is** used exclusively to pull 57-foot **trailers**
 - (B) The PM performance requirement for the vehicle has been met and,
 - (C) The engine installed in the vehicle **is** at least a 2004 model year NOx emissions equivalent and,
 - (D) On the compliance date, all vehicles in the fleet that do not qualify for the exemption under this section have met the requirements of **section 2025(e)** and,
 - (E) The law limiting the total length of a combination vehicle **to** 65 feet **as** described in section 35401 (a) of the California **Vehicle** Code has not been amended prior to January 1, 2010 to increase the length restriction.
- (3) *Provisions for Unique Vehicles.* Upon providing documentation demonstrating that a vehicle meets the definition of a unique vehicle **as** defined in section 2025(d)(69), the Executive Officer will not require the vehicle to be replaced in order to meet the NOx performance requirements prior to January 1, 2021, but will still be required to be including in the fleet if using the fleet averaging or BACT percentage limits option. On the compliance date, all vehicles in the fleet that do not qualify for the exemption under this section must meet the requirements of sections 2025(f), (g), or (h).
- (4) *Exemption for Low-Use Vehicles and Three Day Pass Vehicles.*
- (A) Low-use vehicles are exempt from the performance requirements of section 2025(e) but the owner must keep records and meet the reporting requirements in accordance with sections 2025(q) and (r). To be considered a low-use vehicle, the fleet owner must submit engine operation data from a properly functioning odometer and non-resettable hour meter unless they have a three day **pass**. Low-use vehicles need not be included when determining compliance with the BACT percent limits of section 2025(g) or when calculating fleet average indices and target rates for the fleet averaging option of section 2025(h).
 - (B) Vehicles used both for emergency operations **as** defined in section 2025(d)(24), and for other purposes, do not need to consider the **hours** of operation or mileage the vehicle accrues when used for emergency operations in determining whether the vehicle meets the definition of a low-use vehicle. If the vehicle meets the low-use definition of section 2025(d)(41), it **is** exempt from the performance requirements of section 2025(e), but it **is** subject to the requirements of section 2025(0)(4) for low-use vehicles.
 - (C) Vehicles that formerly met the **low-use** vehicle definition, but whose use increases to 100 hours per year or greater or whose mileage increases to 1,000 miles or greater, must immediately meet the performance requirements of section 2025(f), or (g) or (h) for the immediately preceding

compliance deadline unless it takes advantage of one of the exemptions listed in section 2025(0).

(D) Three day pass vehicles may operate in California for the specified three day period provided a request is made to the Executive Officer and permission is granted prior to the operation in California.

- (5) *Exemption for Vehicles Awaiting Sale* - Vehicles in the possession of dealers, financing companies, or other entities who do not intend to operate the vehicle in California or offer the vehicle for hire for operation in California, that are operated only to demonstrate functionality to potential buyers or to move short distances while awaiting sale or for maintenance purposes, are exempt from all requirements in section 2025.
- (6) *Exemption for Vehicles Used Solely on San Nicolas or San Clemente Islands* - Vehicles used solely on San Nicolas or San Clemente Islands are exempt from all requirements in section 2025. If the land use plans for the islands are changed to allow use by the general public of the islands, this exemption shall no longer be applicable.
- (7) *Compliance Extension Based on Early Action.*
If a fleet owner installs the highest level VDECS for PM on one or more vehicles before January 1, 2010, the owner would be exempt from the NOx BACT requirements of sections 2025(f), the NOx BACT percent limits of section 2025(g) and the NOx and PM fleet averaging requirements of section 2025(h) until January 1, 2014 for each vehicle that has been retrofit early.
- (8) *Credit for Hybrid Vehicles*
- (A) Prior to January 1, 2018, upon presentation of proper documentation, the Executive Officer shall grant an owner credit; as set forth in (B) below, towards compliance with the fleet average for **using** hybrid vehicles defined in section 2025(d)(36) if the owner can demonstrate that the manufacturer has improved the fuel economy of the hybrid vehicle by at least 20 percent compared to a diesel vehicle of the same model year that performs a similar function and has a similar configuration to that of the hybrid vehicle.
- (B) Upon approval by the Executive Officer, the fleet shall receive for each compliance year prior to 2017, a credit that double counts the number of hybrid vehicles in the fleet that may be used to calculate the PM and NOx indices and target rates for the percent limits requirements of section 2025(g) and for the fleet averaging option of section 2025(h).
- (9) *Credit for Alternative Fuel Vehicles* - Upon presentation of proper documentation, the Executive Officer will grant a fleet credit for using vehicles equipped with alternative fuel or heavy-duty pilot ignition engines, in calculating the NOx and PM fleet averages under section 2025(h). Upon approval, the fleet would be allowed to use the NOx emission factor for the engine model year to which the alternative

or heavy-duty pilot ignition engines have been certified in calculating the NO_x index and zero for the PM index.

(10) *Compliance Extension for Emissions Control Device Manufacturer Delays:*

An owner who has purchased, but has not received, a VDECS, a replacement engine, or vehicle in order to comply with this regulation will be excused from immediate compliance if the VDECS or vehicles have not been received due to manufacturing delays as long as all the conditions below are met:

- (A) Except for VDECS purchased to replace a failed or damaged VDECS, the VDECS or vehicle was purchased, or the owner and seller had entered into contractual agreement for the purchase, at least four months prior to the required compliance date; in the case of VDECS purchased to replace a failed or damaged VDECS, the fleet owner and seller had entered into contractual agreement for the purchase within 60 days of the VDECS failure.
- (B) The owner has identified the vehicle to be equipped with the VDECS or replaced upon receipt of the replacement VDECS or vehicle.
- (C) Proof of purchase, such as a purchase order, down payment, or signed contract for the sale, including specifications for each VDECS, must be maintained by the owner and provided to an agent or employee of ARB upon request.
- (D) The new or retrofit vehicles are immediately placed into operation upon receipt.

(11) *Change in Exemption Status.* A fleet owner of a vehicle that formerly qualified for any of the compliance extensions or exemptions granted in section 2025(0) or 2025(m) but whose status has changed so that it no longer meets the applicable definition, must immediately bring the fleet into compliance with performance requirements of section 2025(f), or (g), or (h) for the immediately preceding compliance deadline, and must notify the Executive Officer of the change in status within 30 days from the date of the change.

(p) *Special Provisions for VDECS and Experimental Diesel Emission Control Strategies*

(1) *VDECS Requirements*

- (A) *VDECS Installation.* Before installing a VDECS on a vehicle, the owner must ensure that:
 1. The VDECS is verified for use with the engine and vehicle, as described in the Executive Order for the VDECS.
 2. Use of the vehicle is **consistent** with the conditions of the Executive Order for the VDECS.
 3. The VDECS is installed in a verified configuration.

4. The engine to be retrofit meets engine manufacturer's specifications for installation of the VDECS.
 5. The VDECS label will be visible after installation.
- (8) *VDECS Maintenance.* If a fleet owner installs a VDECS to meet the requirements of section 2025(e), the VDECS must remain installed until the VDECS fails or is damaged or is replaced with a similar or higher level VDECS. Requirements for VDECS failure or damage are in section 2025(0)(9). The owner of a vehicle retrofit with a VDECS must ensure that the VDECS and engine are properly maintained as recommended by the respective manufacturers.

(2) *Failure or Damage of a VDECS.*

In the event of a failure or damage of a diesel emission control strategy, the following conditions apply:

- (A) *Failure or Damage During the Warranty Period.* If a VDECS fails or is damaged within its warranty period, and the VDECS manufacturer or authorized dealer determines that it cannot be repaired, the owner must replace the VDECS with the same level or higher level VDECS for the vehicle within 90 days of the failure.
- (8) *Failure or Damage Outside of Warranty Period.* If a VDECS fails or is damaged outside of its warranty period and cannot be repaired, and if the fleet could not meet an applicable target for the most recent compliance date without the failed VDECS, then within 90 days of the failure, the owner must replace the failed VDECS with the highest level VDECS available for the engine at time of failure.

(3) *Fuel-Based Strategy VDECS.*

- (A) If a fleet owner determines that the highest level VDECS for a large percentage of the fleet would be a level 2 fuel verified as a diesel emission control strategy, and implementation of this VDECS would require installation of a dedicated storage tank, then the owner shall request prior approval from the Executive Officer to allow use of the level 2 fuel-based strategy across its fleet.
- (8) *Waiver for Discontinuation of Fuel Verified as a Diesel Emission Control Strategy.* If a fleet owner has relied upon a fuel verified as a diesel emission control strategy to meet an applicable performance requirement and has to discontinue use of the fuel due to circumstances beyond the fleet owner's control, the fleet owner shall apply to the Executive Officer no later than 30 days after discontinuing use of the fuel for a compliance waiver of up to two years to provide the fleet owner time to return to compliance with the applicable performance requirements. The Executive Officer shall respond to the request within 30 days and grant the request upon finding that the application is complete, outlines the compliance strategy to be used, and that all reporting requirements have been met.

(4) *Use of Experimental Diesel Emission Control Strategies.*

(A) If a fleet owner wishes to use an experimental or non-verified diesel emission control strategy, the owner must first obtain approval from the Executive Officer for a compliance extension. To obtain approval, the owner must demonstrate either that (1) a VDECS is not available or not feasible for their vehicle or application, or (2) that use of the non-verified strategy is needed to generate data to support verification of the strategy.

1. The application must include emissions data and a detailed description of the control technology demonstrating the experimental control strategy achieves at least a level 2 diesel PM emission reduction.
2. The Executive **will** treat the strategy as follows:
 - a. As a level 2 VDECS if the application demonstrates that the strategy achieves **at** least 50 percent reduction in diesel PM.
 - b. As a level 3 VDECS if the application demonstrates that the strategy achieves at least 85 percent reductions in diesel PM.
3. If the application demonstrates that the strategy achieves a NOx reduction of over 15 percent, the NOx reduction will be counted.

(8) Upon approval by the Executive Officer, each vehicle engine retrofit with the experimental strategy will be allowed to operate for a specified time period necessary to **make** a determination that the experimental strategy can achieve the projected emissions reductions. The vehicle equipped with the experimental strategy will be considered to be in compliance under section 2025(f), (g), or (h) during the specified time period. The fleet owner shall keep documentation of this use in records as specified by the Executive Officer.

(C) The fleet owner must bring the fleet into compliance under section 2025(f), (g), and (h) prior to the expiration of the experimental diesel emission control strategy extension.

(5) *VDECS That Impairs Safe Operation of Vehicle* - A fleet owner may request that the Executive Officer find that a VDECS should not be considered the highest level VDECS available because (A) it cannot be safely installed or operated in a particular vehicle application, or (B) its use would make compliance with occupational safety and health requirements, or an ongoing local air district permit condition impossible.

If a VDECS manufacturer states that there is no safe or appropriate method of mounting its VDECS on the requesting party's vehicle, then the VDECS will not be considered safe. In the absence of such a declaration by the VDECS manufacturer, the requesting party shall provide other documentation to support its claims.

Documentation may include published reports and other findings of federal, state or local government agencies, independent testing laboratories, engine

manufacturers, or other equally reliable sources. The request will only be approved if the requesting party has made a thorough effort to find a safe method for installing and operating the VDECS, including various locations for VDECS mounting, and use of an actively regenerated VDECS. The Executive Officer shall review the documentation submitted and any other reliable information that he or she wishes to consider and shall make his or her determination based upon the totality of the evidence.

Upon finding that a VDECS cannot be installed without violating the safety standards prescribed under title 8, CCR by the California Department of Industrial Relations, Division of Occupational Safety and Health, or comparable federal or state law where the vehicle operates, the Executive Officer shall issue a determination that there is no highest level VDECS available. The Executive Officer shall inform the requesting party, in writing, of his or her determination, within 60 days of receipt of the request.

Parties may appeal the Executive Officer's determination as described in (A) and (B) below. During the appeal process described in (A) and (B) below, the requesting party may request the administrative law judge to stay compliance until a final decision is issued. If the stay is granted and the Executive Officer denies the requesting party's request, the requesting party has six months from the date of the Executive Officer's final written decision to bring his or her fleet back into compliance.

(A) *Appeals - Hearing Procedures*

1. Any party whose request has been denied may request a hearing for the Executive Officer to reconsider the action taken by sending a request in writing to the Executive Officer. A request for hearing shall include, at a minimum, the following:
 - a. name of the requesting party;
 - b. copy of the Executive Officer's written notification of denial;
 - c. a concise statement of the issues to be raised, with supporting facts, setting forth the basis for challenging the denial (conclusory allegations will not suffice);
 - d. a brief summary of evidence in support of the statement of facts required in c. above; and
 - e. the signature of an authorized person requesting the hearing
2. A request for a hearing shall be filed within 30 days from the date of issuance of the notice of the denial.
3. A hearing requested pursuant to this section shall be heard by a qualified and impartial hearing officer appointed by the Executive Officer. The hearing officer may be an employee of the ARB, but may not be any employee who was involved with the denial at issue. In a request for reconsideration, the hearing officer, after reviewing the request for hearing and supporting documentation provided under paragraph 1. above, shall grant the request for a hearing if he or she

finds that the request raises a genuine and substantial question of law or fact.

- 4: If a hearing is granted, the hearing officer shall schedule and hold, as soon as practicable, a hearing at a time and place determined by the hearing officer.
5. Upon appointment, the hearing officer shall establish a hearing file. The file shall consist of the following:
 - a. the determination issued by the Executive Officer which is the subject of the request for hearing;
 - b. the request for hearing and the supporting documents that are submitted with it;
 - c. all documents relating to and relied upon by the Executive Officer in making the initial determination to deny the requesting party's original claim; and
 - d. correspondence and other documents material to the hearing.
6. The hearing file shall be available for inspection by the applicant at the office of the hearing officer.
7. An applicant may appear in person or be represented by counselor by any other duly-authorized representative.
8. The ARB may be represented by staff or counsel familiar with the regulation and may present rebuttal evidence.
9. Technical rules of evidence shall not apply to the hearing, except that relevant evidence may be admitted and given probative effect only if it is the kind of evidence upon which reasonable persons are accustomed to relying in the conduct of serious affairs. No action shall be overturned based solely on hearsay evidence, unless the hearsay evidence would be admissible in a court of law under a legally recognized exception to the hearsay rule.
10. Declarations may be used upon stipulation by the parties.
11. The hearing shall be recorded either electronically or by a certified shorthand reporter.
12. The hearing officer shall consider the totality of the circumstances of the denial, including but not limited to, credibility of witnesses, authenticity and reliability of documents, and qualifications of experts. The hearing officer may also consider relevant past conduct of the applicant including any prior incidents involving other ARB programs.
13. The hearing officer's written decision shall set forth findings of fact and conclusions of law as necessary.
14. Within 30 days of the conclusion of a hearing, the hearing officer shall submit a written proposed decision, including proposed finding as well as a copy of any material submitted by the hearing participants as part of that hearing and relied on by the hearing officer, to the Executive

Officer. The hearing officer may recommend to the Executive Officer any of the following:

- a. uphold the denial as issued;
 - b. modify the denial; or
 - c. overturn the denial in its entirety.
15. The Executive Officer shall render a final written decision within 60 working days of ~~the~~ last day of hearing. The Executive Officer may do any of the following based on substantial evidence in the record:
- a. adopt the hearing officer's proposed decision;
 - b. modify the hearing officer's proposed decision; or
 - c. render a decision without regard to the hearing officer's proposed decision.

(B) Appeals - Hearing Conducted by Written Submission.

In lieu of the hearing procedure set forth in (A) above, an applicant may request that the hearing be conducted solely by written submission. In such case the requestor must submit a written explanation of the basis for the appeal and provide supporting documents within 20 days of making the request. Subsequent to such a submission the following shall transpire:..

1. ARB staff shall submit a written response to the requestor's submission and documents in support of the Executive Officer's action no later than 10 days after receipt of the requestor's submission;
2. The applicant may submit one rebuttal statement which may include supporting information, as attachment(s), but limited to the issues previously raised;
3. If the applicant **submits** a rebuttal, ARB staff may submit one rebuttal statement which may include supporting information, as attachment(s), but limited to the issues previously raised; and
4. The hearing officer shall be designated in the same manner as set forth in section 2025(p)(5)(A)3 above. The hearing officer shall receive all statements and documents and submit a proposed written decision and such other documents as described in section 2025(p)(5)(A)13 above to the Executive Officer no later than 30 working days after the final deadline for submission of papers. The Executive Officer's final decision shall be mailed to the applicant no later than 60 days after the final deadline for submission of papers.
5. The Executive Officer shall render a final written decision within 60 working days of the last day of hearing. The Executive Officer may do any of the following:
 3. adopt the hearing officer's proposed decision;
 4. modify the hearing officer's proposed decision; or

5. render a decision without regard to the hearing officer's proposed decision.

(q) *Reporting*

The owner of a fleet is subject to the reporting requirements of section 2025(q) if the owner has elected to utilize the BACT percent limits option of section 2025(g), the fleet averaging option of section 2025(h), or the special provisions and compliance extensions of section 2025(0).

All fleet owners utilizing any of the exemptions; compliance extensions, or credit in section 2025(0) must report and comply with the requirements of section 2025(q) and 2025(r) for all of their vehicles, regardless of whether the vehicle is utilizing of the special provisions or not.

- (1) The owner must notify the Executive Officer of the compliance option that it has selected in writing by January 31, 2010 and by January 31 of every subsequent compliance year. The notification must include the name of the responsible official and the location where the records will be kept. If the records will be kept outside California, the owner must also comply with section 2025(s). If a fleet owner opts to comply with fleet averaging performance **requirements** separately for different divisions or subsidiaries according to section 2025(e)(5), then the company or agency may report separately for the different portions of the fleet.
- (2) Each year, fleet owners subject to the reporting requirement must report on their fleet as it was on January 1 of the current compliance year. They must submit the applicable information set forth in sections 2025(q)(1) through (11) by January 31 following each compliance date. Owners must report annually until the reporting requirement expires or fleets may stop reporting the year after the BACT requirements of section 2025(f) have been met. Fleets may submit information by mail or electronically.
- (3) *Owner Contact Information:* Compliance reports must include the information in (A) through (L) below.
 - (A) Fleet owner's name,
 - (B) Name of company or agency,
 - (C) Motor carrier identification number,
 - (D) Corporate parent name (if applicable),
 - (E) Corporate parent taxpayer identification number (if applicable),
 - (F) Company taxpayer identification number,
 - (G) Street address and mailing address,
 - (H) Name of responsible person,
 - (I) Title of responsible person,
 - (J) Contact name,

- (K) Contact telephone number,
- (L) Contact email address (if available).

(4) *Vehicle Information.*

Fleet owners must provide to the Executive Officer a list of all vehicles subject to the reporting requirements along with the information listed in (A) through (L) below for each vehicle:

- (A) Vehicle type,
- (B) Vehicle identification number,
- (C) Vehicle manufacturer,
- (D) Vehicle model;
- (E) Gross vehicle weight rating as defined in sections 2025(d)(33) or 2025(d)(42)
- (F) Vehicle model year,
- (G) License plate number,
- (H) Where the vehicle is registered and type of registration plate;
- (I) Whether the vehicle will be designated as a low-use vehicle;
 1. For vehicles designated as low-use, fleet owners must report the information listed in section 2025(q)(8).
 2. Report whether the low-use status is based on mileage or hours of operation.
- (J) Whether the vehicle is used for emergency operations;
 1. For low-use or mileage exempt vehicles used in emergency operations, fleet owners must report the information listed in section 2025(q)(10).
- (K) Whether the vehicle is a sweeper, specialty agricultural vehicle, cab-over-engine truck tractor, or unique vehicle as defined in sections 2025(m) and 2025(0);
- (L) Whether the vehicle is a hybrid vehicle as defined in section 2025(d)(36).
- (M) Whether the vehicle is an alternative-fueled vehicle as defined in section 2025(d)(8).

(5) *Engine Information.*

The following information for each engine that propels a vehicle reported per section 2025(q)(4) must be reported to the Executive Officer:

- (A) Engine manufacturer,
- (B) Engine model,
- (C) Engine family,
- (D) Engine serial number, and
- (E) Engine model year.

(6) *Verified Diesel Emission Control Strategies.*

For each VDECS that is installed on an engine listed per section 2025(q)(5), the fleet owner must report the following information to the Executive Officer.

- (A) Type of VDECS installed,
- (B) VDECS manufacturer,
- (C) VDECS family name,
- (D) Serial number,
- (E) Date installed.

(7) *Availability of Highest Level VDECS*

If appropriate, the following information must be submitted to the Executive Officer with a request for an extension based on the unavailability of highest level VDECS:

- (A) Owner contact information, vehicle, and engine information listed in sections 2025(q)(3), (4), and (5).
- (B) Description of the reason for the compliance extension request for each engine or engine-vehicle combination.
- (C) If the VDECS would void the engine warranty, provide a statement from the engine manufacturer or authorized dealer.
- (D) If no verified VDECS is commercially available, provide a list of manufacturers that have been contacted and the manufacturers' responses to a request to purchase..
- (E) Documentation must be submitted on January 31 following the compliance deadline for each year that the **owner** is claiming non-availability of the highest VDECS.

(8) *Low-Use Vehicles.*

For vehicles that are designated as low-use, the fleet owner must report the following information to the Executive Officer annually for as long as the fleet owns or operates the vehicle:

- (A) Owner, vehicle, and engine information identified in sections 2025 (q)(1) through (5);
- (B) Mileage from odometer readings from a properly functioning odometer taken on January 1 and December 31 of the compliance year.
- (C) Hour-meter readings from a properly functioning hour-meter taken on January 1 and December 31 of the compliance year.
- (D) The dates of the odometer and hour-meter readings. In the event that the odometer meter is replaced, the original odometer reading and the new odometer reading and the date of replacement must be reported.
- (E) The owner of a vehicle operating both inside and outside of California **must** provide records from a tracking system as defined in section (d)(22)

that can acquire date, time, engine-on, and location data. The owner may use other documentation of operation and location, such as IRP records.

(9) **Vehicles in Agricultural Fleets.**

For all vehicles owned as of January 1, 2009, an agricultural fleet owner must report the information in this section to the Executive Officer for all vehicles (including vehicles that do not qualify as agricultural vehicles) by January 31, 2009 and every year thereafter. For each vehicle "in an agricultural fleet, the agricultural fleet owner must report the following information until January 1, 2023:

- (A) Information required in sections 2025(q)(1) through (5).
- (8) Whether the vehicle is a low-mileage, limited-mileage, or specialty agricultural vehicle, or is none of these.
- (C) Identify which **specialty** vehicle from 2025(d)(64) is being claimed.
- (O) Mileage from a properly functioning odometer taken on January 1, 2011 and every January 1 thereafter. In the event that the odometer is replaced, the original odometer reading, the new odometer reading, and the date the odometer was replaced.
- (E) For a low, limited, or specialty agricultural vehicle being replaced the owner, vehicle, and engine information" in sections 2025(q)(1) through (6), the mileage of the vehicle being replaced and added," and the date the mileage reading were taken.

(10) *Vehicles used in emergency operation.*

A fleet owner must provide the following information to the Executive Officer to qualify a vehicle's usage as emergency operation:

- (A) Owner, vehicle, and engine information identified in sections 2025 (q)(1) through (6);
- (8) Odometer readings from a properly functioning odometer to document travel to and from the emergency event. In the event that the odometer meter is replaced the original odometer reading and the new odometer reading and the date of replacement must be reported; and
- (C) Records" to document dispatch by the responsible emergency management personnel.

(11) *Vehicles Exempt from the NOx Performance Standard.*

(A) *Exemption Based on Early Action.*

The owner must provide the following information to the Executive Officer by January 1, 2010.

1. Owner, vehicle, and engine information listed in sections 2025(q)(1) through (5)
2. Information listed in section 2025(q)(6) for the VOECS.

(B) NOx Mileage Exempt Vehicles.

The owner must provide the following information to the Executive Officer by January 31, 2010 and every year thereafter to demonstrate compliance with the requirements of section 2025(0)(1).

1. Owner, vehicle, and engine information listed in sections 2025 (q)(1) through (7)
2. Mileage and hours of use readings on **January 1** and December 31 of the compliance year taken from a properly functioning odometer and hour-meter for vehicles meeting the definition of sections 2025(d)(52)(A) or (B) and mileage only readings for vehicles meeting the definitions of 2025(d)(52)(C) or (D). The owner must keep on record the mileage and usage records generated by the tracking system to meet the record keeping requirements of section 2025(r).
A NOx mileage exempt vehicle that does not perform work in stationary mode need not report hours of use.
3. Evidence that the owner filed a Heavy Highway Vehicle Use Tax Return and was granted a suspension of the tax based on mileage use for the vehicle during the current compliance period.

(C) Vehicles operating exclusively in NOx-exempt areas.

The owner must provide the following information to the Executive Officer by January 31, 2010 to demonstrate compliance with the requirements of section 2025(0)(1):

1. Owner, vehicle, engine information, and VDECS listed in sections 2025(q)(1) through(7);
2. Records from a tracking system that tracks usage and location in a monthly report format approved by ARB. The system must at a minimum meet the performance requirements as defined in section 2025(d)(22) and provide the information listed therein.

(12) Compliance Certification.

All reports submitted to ARB, must be accompanied with a certification signed by a responsible official or a designee thereof that the information reported is accurate and that the fleet is in compliance with the regulation. If a designee signs the compliance certification, a written statement signed by the responsible official designating the designee must be attached to the compliance certification and submitted to the Executive Officer.

- (13) Changes Since Last Reporting -** The fleet owner or responsible person must report to the Executive Officer any additions, deletions, or changes to the fleet since the last annual report filed. Such changes shall include, among other things, changes in the fleet's compliance option, vehicles removed from the fleet, vehicles added to the fleet through purchase or by bringing into California, and vehicles newly defined as low-use, or recently repowered or retrofit. If there are no changes, the fleet owner shall indicate there have been no changes.

- (14) *New Fleet Reporting.* New fleets that elect to utilize the BACT percent limits option of section 2025(g) or the fleet averaging option of section 2025(h) must submit the information in section 2025(q)(1) through (5) to the Executive Officer within 30 days of purchasing or bringing such vehicles into the State. Beginning the first January 1 that is more than 30 days after the date of purchase or bringing a vehicle into the State, new fleets must comply with the reporting requirements in section 2025(q).
- (r) *Record Keeping.*
- (1) The owner of a fleet shall maintain the following records specified in sections 2025(r)(4) through (11) as applicable. The owner shall provide these records to an agent or employee of the ARB within five business days upon request.
 - (2) The owner of a fleet subject to the **reporting** requirements of section 2025(q) shall maintain copies of the information reported under section 2025(q), as well as the records described in sections 2025(r)(4) through (11) below.
 - (3) Motor Carrier or Broker
 - (A) Bills of lading and other documentation identifying the motor carrier or broker who hired or dispatched the vehicle and the vehicle dispatched.
 - (4) Agricultural Fleets
 - (A) Fleets utilizing the agricultural fleet provision must keep and make available upon request proof that all agricultural vehicles were used exclusively in agricultural operations. This may include records used to support proof to other governmental agencies that the primary business function was agricultural. Such documentation may include IRS or Board of Equalization tax forms or bills of lading.
 - (B) Records must be maintained for each agricultural vehicle demonstrating that the vehicle was operational, functional and capable of performing the duty for which it was designed. This could include maintenance records, mileage records, or licensing records, emissions testing records, or any other source of **data** approved by the Executive Officer.
 - (C) The agricultural fleet owner must keep bills of lading for delivery of fertilizer or crop protection products by an agricultural vehicle to a farm. Such records must demonstrate that the operation of the vehicle for the preceding calendar year was used exclusively to deliver such products to farms.
 - (D) Proof of transference of ownership of any low or limited-mileage agricultural vehicles that is added to or removed from the fleet.
 - (E) Proof of ownership of the vehicles including title, registration, or bills of sale.
 - (5) *Changes Since Last Reporting Period-* Document any additions, deletions, or changes to the fleet since the last reporting. Documentation may include bills of sale, purchase orders, or other documentation.

- (6) *Electronic Tracking* - For fleets using electronic tracking systems as defined in section 2025(d)(22) , summary and detailed records must be kept at the business office or terminal location for the fleet. The records must provide;
- (A) Vehicle identification number of the vehicle being tracked;
 - (B) Monthly and annual mileage accrued in California;
 - (C) Monthly and annual mileage accrued in the NOx Exempt Areas if claiming the vehicle operates exclusively in NOx-exempt areas, and
 - (D) Monthly and annual hours of engine operation accrued in California except for vehicles that do not use PTO to perform **work** in a stationary mode.
- (7) *VDECS Failure* - Maintain records of any VDECS failure and replacement.
- (8) *Fuel-based Strategy*-.Documentation of **any** approval from ARB Executive Officer to use a fuel strategy as in section 2025(0)(3) and the most recent two years' worth of records of purchase that demonstrate usage.
- (9) *Experimental Diesel Emission Control Strategy*- For fleets using an experimental diesel PM cQntrol strategy, record of approval from the Executive Officer for use of the experimental diesel control strategy, the test plan and test data used in the experimental diesel control strategy application, and other records as specified in the approval.
- (10) *Manufacturer Delay*- For any vehicle or VDECS for which the fleet owner is utilizing the equipment manufacturer delay provision in section 2025(0)(10), proof of purchase, such as a purchase order or signed contract for the sale, including engine specifications for each applicable piece of equipment or vehicle.
- (11) *Maintenance of VDECS Records*
- (A) VDECS Documentation. For each engine requiring a VDECS to comply with the regulation, the owner shall keep the following documentation in the vehicle and provide it upon request to an agent or employee of the ARB
 1. A statement signed by the installer at the time of installation of the VDECS affirming that the VDECS was installed by an authorized installer, and providing the following information for each engine:
 - a. The name of the person installing the device
 - b. The date the device was installed
 - c. Type of VDECS installed,
 - d. Manufacturer
 - e. VDECS family name,
 - f. Serial number,
 - g. Its verification level and year of verification.

(s) *Audit of Records*

The vehicle owner must make records available to ARB at its request for audit to verify the accuracy of the records. In the event the records are not made available within

30 days of the request, the ARB may assess penalties for non-compliance. The fleet owner may be required to reimburse the ARB auditor per diem and travel expenses under certain conditions as determined by the Executive Officer.

(t) *Record Retention*

The fleet owner or responsible person shall maintain the records for each vehicle subject to the reporting and record keeping requirements of sections 2025(q) and (r) for 3 years after it is retired or January 1, 2025, whichever is earlier. If fleet ownership is transferred, the seller shall transfer the fleet records to the buyer. Dealers must maintain records of the disclosure of regulation applicability required by section 2025(v) for three years after the sale.

(u) *Right of Entry*

For the purpose of inspecting vehicles and their records to determine compliance with this regulation, an agent or employee of ARB, upon presentation of proper credentials, has the right to enter any facility (with any necessary safety clearances) where vehicles are located or vehicle records are kept.

(v) *Disclosure of Regulation Applicability*

Any person residing in California selling a vehicle with an engine subject to this regulation must provide the following disclosure in writing to the buyer on the bill of sale, "An on-road heavy-duty diesel or alternative-diesel vehicle operated in California may be subject to the California Air Resources Board Regulation to Reduce Particulate Matter and Criteria Pollutant Emissions from In-Use Heavy-Duty Diesel Vehicles. It therefore could be subject to exhaust retrofit or accelerated turnover requirements to reduce emissions of air pollutants. For more information, please visit the California Air Resources Board website at <http://www.arb.ca.gov/dieseltruck...>

(w) *Compliance Requirement.*

- (1) The vehicle owner shall comply with all applicable requirements and compliance schedules set forth in this regulation.
- (2) Any in-state or out-of-state motor carrier, California broker, or any California resident who operates or directs the operation of any vehicle subject to this regulation shall verify that each hired or dispatched vehicle is in **compliance** with the regulation.
- (3) Compliance may be accomplished by keeping on site a copy of the Certificate of Reported Compliance with the In-Use On-Road Diesel Vehicle Regulation for each fleet.
- (4) Any contract that a lessor and lessee enter into that has an effective date of January 1, 2010 or later shall clearly specify whether or not the leased vehicle is to be excluded from the lessor's fleet for the duration of the lease, or the responsibility will be that of the lessee.

(x) *ARB Certificate of Reported Compliance*

After the required reporting and compliance certification are received by ARB staff, ARB will provide the fleet with a Certificate of Reported Compliance with the In-Use On-road Diesel Vehicle Regulation. ARB staff will also post on the website for this regulation the motor carrier number for fleets that have reported compliance.

(y) *Non-Compliance.*

Any person who fails to comply with the performance requirements of this regulation, who fails to submit any information, report, or statement required by this regulation, or who knowingly submits any false statement or representation in any application, report, statement, or other document filed, maintained, or used for the purposes of compliance with this regulation may be subject to civil or criminal penalties under sections 39674, 39675, 42400, 42400.1, 42400.2, 42402.2, and 43016 of the Health and Safety Code. In assessing penalties, the Executive Officer will consider factors, including but not limited to the willfulness of the violation, the length of time of noncompliance, whether the fleet made an attempt to comply, and the magnitude of noncompliance.

(z) *Severability*

Any subsection, paragraph, subparagraph, sentence, clause, phrase, or portion of this regulation is, for any reason, held invalid, unconstitutional, or unenforceable by any court of competent jurisdiction, such portion shall be deemed as a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions of the regulation.

Note: Authority Cited: Sections 39600, 39601, 39650, 39658, 39659, 39666, 39667, 39674, 39675, 42400, 42400.1, 42400.2, 42402.2., 42410, 43013, 43016, 43018, 43023, 43600, California Health and Safety Code. Reference: Sections 39650, 39658, 39659, 39666, 39667, 39674, 39675, 42400, 42400.1, 42400.2, 42402.2, 42410, 40717.9, 43013, 43016, 43018, 43023, 43600, and 43701 (b), California Health and Safety Code.

APPENDIX A

Table A-1**PM Emissions Factors by Engine Model Year**
(g/mile)

Engine Certification Standard Model Year	Medium Heavy-Duty Diesel Vehicle (MHD)	Heavy Heavy-Duty Diesel Vehicle (HHD)
Pre-1991	1.65	3.36
1991-1993	0.84	1.25
1994-2006	0.43	0.81
2007-2009*	0.06	0.11
2010 and newer*	0.06	0.11

* If the engine is not equipped by the manufacturer with a diesel particulate filter, use the emission factor for the 1994-2006 model years

Table A-2**NOx Emissions Factors by Engine Model Year**
(g/mile)

Engine Certification Standard Model Year	Medium Heavy-Duty Diesel Vehicle (MHD)	Heavy Heavy-Duty Diesel Vehicle (HHD)
2003 and older	14.2	22.0
2004-2006	6.7	12.0
2007-2009	4.0	7.0
2010 and newer	0.8	1.6

Appendix A1

Summary of Proposed Regulation to Reduce Emissions from In-Use Diesel Vehicles

SUMMARY OF PROPOSED REGULATION ORDER

Title 13, CCR, section 2025

Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants, and Greenhouse Gases from In-Use Heavy Duty Diesel-Fueled "Truck and Bus Regulation"

- (a) Purpose - To reduce emissions of diesel particulate matter, oxides of nitrogen, and greenhouse gases from in-use diesel vehicles.
- (b) Scope and Applicability
 - (1) This section describes to whom this regulation applies. This includes persons, businesses, and federal government agencies that own, operate, lease, or rent, diesel powered heavy-duty vehicles, buses, and shuttle vehicles operating in California.
- (c) Exemptions - This section lists for whom the regulation does not apply, such as most previously regulated vehicles, military support vehicles, certain off-road vehicles, two-engine cranes, snow-removal vehicles, historic vehicles, and motor homes.
- (d) Definitions – This section defines the terms used within the regulation such as PM and NOx BACT, and heavy and medium duty heavy-duty vehicles. PM BACT is defined as highest level **VDECS** for on-road engines and 0.2 g/bhp-hr or less for off-road engines. The definition of PM BACT includes the prOVision to extend the compliance date to 2018 should no VDECS be available. NOx BACT is defined as a 2010 or later model year engine for on-road and a Tier 4 final engine for off-road engines. Finally, medium-duty vehicles are defined as vehicles with a **GVWR** less than 33,001 lbs excluding any truck-tractors, while heavy-duty includes all truck-tractor and vehicles with a GVWR greater than 33,000 lbs.
- (e) Performance Requirements
 - (1) This sections sets forth general requirements of the regulation including the three compliance options; the (BACT) compliance schedule option, the BACT percentage limits option, and the fleet averaging option which are detailed in sections (f), (g), and (h).
 - (2) Describes how schoolbuses must meet the requirements for PM but not NOx.
 - (3) Describes the overall compliance requirements for general fleets with schoolbuses sub-fleets.
 - (A) Directs schoolbus sub-fleets to comply with section **2025(j)**.
 - (B) Allows schoolbus sub-fleets to be combined with other vehicles in the general fleet, to be used for compliance with one of the three options. Prevents vehicles from the general fleet from being used for school bus compliance.
 - (4) Requires drayage vehilces to comply with section 2025(k).
 - (5) Allows divisions of large fleets to comply separately though those divisions.
 - (6) Allows compliance by adding technology, engine replacement, or vehicle replacement.

- (7) With certain exceptions, when using the BACT compliance schedule, requires vehicle owners to possess the required operating and business licenses as set forth by federal and state law.
 - (8) Requires NOx exempt vehicles other than schoolbuses to comply with special NOx exemption requirements.
 - (9) Allows small fleets to optionally meet delayed requirements.
 - (10) Requires all information required to be reported to the Executive Officer.
 - (11) Requires records to be kept.
 - (12) A vehicle in compliance must remain in compliance.
- (f) Details the BACT compliance schedule option - Table 1 sets forth the dates at which vehicles of certain model years must meet PM and NOx BACT. The first compliance date for meeting PM BACT is January 1, 2011 while the first compliance date for NOx is January 1, 2013.
 - (g) Details the BACT Percentage Limits option. - Table 2 set forth the dates at which certain percentages of fleet must comply with PM and NOx BACT.
 - (h) Details the Fleet Averaging Option – This section explains how the fleet averaging option works. It provides the mathematical formulas for determining the PM and NOx Indices and for calculating the PM and NOx Target Rates.
 - (i) Optional Requirements for Small Fleets- This section details the provisions for small fleets. Small fleets can delay compliance until 2013 for one vehicle, 2014 for the next, and 2016 for the third if the second is 2010 model year engine.
 - (1) Fleets with One Vehicle - This section details how owner-operators can comply by upgrading to a vehicle with a 2004 model year engine having the highest level VDECS by 2013 and be in compliance until 2018.
 - (2) Fleets with Two Vehicles - This section states that the second vehicle needs to comply with regulation by 2014.
 - (3) Fleets with Three Vehicles - Three vehicle fleets have the option of delaying compliance of the third vehicle until 2016 if the second is a 2010 model year engine vehicle.

Requirements for Schoolbuses - This section contains the requirements for fleets with schoolbuses. It requires pre-1977 schoolbuses to be retired by 2012 and others to have VDECS installed by 2014. Low-use, those that drive less than 1,000 per year, and historic schoolbuses are exempt from the performance requirements. They must continue to report their information to ARB and be subject to audits.

- (1) Requires pre-1977 schoolbuses to be retired by 2012.
- (2) Allows schoolbuses to comply with PM BACT using any of the three options.
- (3) By January 1, 2014, all schoolbuses must have the highest level VDECS installed.
- (5) Schoolbuses that cannot be retrofitted must be replaced by 2018.
- (6) Schoolbuses must be safety inspected after retrofitting.
- (7) Special Provisions for Schoolbuses

- (A) Credit may be granted for hybrid or alternative fuel schoolbuses.
 - (B) Low-use Schoolbuses
 - 1. Low-use schoolbus are exempt.
 - 2. Low-use schoolbuses need not be included when determining compliance.
 - 3. Low-use schoolbuses that exceed a 1,000 miles per are not exempt.
 - (C) Schoolbuses retrofitted before December 31,2005 are considered in compliance.
- (8) Registered historic schoolbuses are exempt.
- (9) Reporting Requirements for Schoolbus Fleets and Schoolbus Sub-Fleets
- (10) Record Keeping Requirements for Schoolbus Fleets and Schoolbus Sub-Fleets
- (11) Schoolbuses are required to keep records and be subject to audits.
- (k) Requirements for Drayage Trucks and Utility Vehicles - This section specifies that 2004 through 2006 drayage trucks and must comply the requirements of regulation and install VDECS by 2012 for 2004 model year engine trucks and 2013 for 2004-2006 trucks.
- (1) 2004 drayage trucks must install VDECS by January 1, 2012. 2005-2006 trucks must install VDECS by January 1, 2013.
 - (2) Starting in January 1, 2021, all drayage and utility vehicles must comply with the BACT compliance schedule.
- (l) Requirements for Agricultural Fleets - These sections detail the requirements for agricultural fleets (which include agricultural vehicles and non-agricultural vehicles) that utilize any of the agricultural provisions. Agricultural vehicles are defined as fertilizer and crop protection chemical delivery trucks, farmer owned vehicles, vehicles that perform a special function on the farm, and vehicles that transport livestock and harvested crops to the first processing center.
- (1) Low and limited-mileage agricultural vehicles are exempt from the requirements of the regulation until 2023 and 2017, respectively.
 - (2) All non-agricultural vehicles in the agricultural fleet must comply with the BACT compliance schedule or the fleet averaging option.
 - (3) Agricultural-fleet owners must report all information about their fleet.
 - (4) Agricultural vehicles replaced must be reported.
 - (5) Any vehicle that exceeds the mileage restrictions must comply with regulation.
- (6) Requirements for limited-mileage agricultural vehicles - These sections detail the requirements for limited-mileage agricultural vehicles. The number of these vehicles is capped based on the number of vehicles reported to be owned on January 31,2009. The vehicles cannot exceed the annual mileage thresholds of 25,000 for trucks with 2006 model year and newer engines, 20,000 miles for trucks with modelyear engines 1996 through 2005, and 15,000 for trucks with engine older than 1996. On January 1, 2017 these vehicles must meet the requirements of the regulation.
- (A) The maximum number of limited-mileage agricultural vehicles is capped as of January 1,2009.

- (8) Allows replacement of a limited-mileage agricultural vehicle by another vehicle that is at least one model year newer provided the original is sold out of the fleet.
 - (C) Total combined mileage of both replaced and replacement vehicles can not exceed the annual mileage thresholds.
 - (D) The exemption on limited-mileage agricultural vehicles ends January 1, 2017.
 - (E) Any vehicle that exceeds the mileage thresholds must comply with regulation.
 - 1. Any limited-mileage vehicle that exceeds the mileage threshold of a limited-mileage vehicle must comply with regulation and limited-mileage cap is decreased by one.
 - (F) The number of limited-mileage vehicles before a merger can never exceed the number of vehicles after the merger.
- (7) Requirements for low-mileage agricultural vehicles - These sections detail the requirements for low-mileage vehicles. The number of the vehicles will be established based on the number reported by January 31, 2010. These vehicles can never exceed 10,000 miles per year and by January 1, 2023, must meet the requirement of the regulation.
- (A) The maximum number of low-mileage agricultural vehicles is capped as of January 1, 2009.
 - (8) Allows replacement of a low-mileage agricultural vehicle by another vehicle that is at least one model year newer provided the original is sold out of the fleet.
 - (C) Total combined mileage of both replaced and replacement vehicles can not exceed the mileage thresholds.
 - (D) Exemption on limited-mileage agricultural vehicles ends January 1, 2023.
 - (E) Until January 1, 2017, a low-mileage vehicle that exceeds the mileage threshold of limited-mileage vehicle must comply with the regulation and the low-mileage vehicle cap is reduced by one.
 - (F) The number of limited-mileage vehicles before a merger can never exceed the number of vehicles after the **merger**.
 - (G) Until January 1, 2017, a low-mileage vehicle may be moved into the limited-mileage category but the low-mileage vehicle cap will be reduced by **one**.
- (8) Requirements for specialty agricultural vehicles - Four types of vehicles have been defined as specialty agricultural vehicles and are exempt from the requirements of the regulation until January 1, 2023. These vehicles include nurse rigs **used** in conjunction with crop dusters, cotton module movers used to move large bales of cotton, water trucks used to reduce dust on farm roads and irrigate crops, and feed trucks used to feed cattle.
- (A) Specialty agricultural vehicles are exempt until January 1, 2023.

- (B) The EO will approve vehicles under the following conditions:
 1. The total number in the San Joaquin Valley Air Basin does not exceed 1,100, and
 2. The total number statewide does not exceed 2,200.
 - (C) Vehicles exceeding the above numbers must comply with the regulation.
 1. The EO will notify owners of vehicle that exceed the numbers.
- (9) Labeling Requirements for Agricultural Vehicles
- (A) Agricultural vehicles must be labeled with:
 1. The letters AG shall be black on a white background and,
 2. Be located in clear view on the left and right door of the vehicle.
- (m) Requirements for Two-Engine Sweepers - This section requires two-engine sweepers to install the highest level VDECS on the auxiliary engine when the propulsion engine is required to meet the requirement of the proposed regulation. Uncontrolled Tier 0 auxiliary engines can operate no more than 250 hours per year until 2014 and 100 hours thereafter.
- (1) Two-engine sweepers must install the highest level VDEC on the auxiliary engine of the sweeper when the propulsion engine is required to meet the regulation.
 - (2) Two-engine sweepers may not operate any Tier 0 auxiliary engine more than 250 hours until January 1, 2014 and 100 hours thereafter.
 - (3) Labeling Requirements for Two-Engine Sweepers with Tier 0 Auxiliary Engines
 - (A) Within 30 days of the reporting date, fleet owners must permanently affix or paint an SW identification label on each two engine sweeper.
 - (B) Sweepers with Tier 0 auxiliary engines **must** label the vehicle with letters SW that are black on a white background.
 - (C) The label shall be located in clear view on left and **right** side of the vehicle.
- (n) Requirements for a New Fleet and Adding Vehicles to a Fleet. New fleets and vehicles being added must comply with regulation as of the date added.
- (1) New Fleet Requirements. New fleets must comply with the regulation immediately upon purchasing vehicles or bringing them into California.
 - (2) Adding Vehicles to a Fleet. Any vehicle not complying with the BACT compliance schedule must meet the fleet's BACT percentage limits or fleet averaging and file a report within 30 days.
 - (A) Fleets complying with the BACT percentage limits may not add vehicles that that would put them out of compliance.
 - (B) Fleets complying with fleet averaging option may **not** add vehicles that would put them out of compliance.
- (o). Exemptions, Compliance Extensions, and Credits. This section details the parameters for claiming any exemption for NOx mileage exempt vehicles, vehicles that operated solely in the NOx exempt areas, Cab-over-engine vehicles pulling 57 foot trailers, unique vehicles, low-use vehicles, three-day pass vehicles, vehicles

awaiting sale, vehicles operating on San Nicolas or San Clemente islands, vehicles performing early action, hybrid vehicles, alternative fuel vehicles, extensions for manufacturer delays, changes in exempt status, failure of VDECS, fuel-based VDECS, use of experimental DECS, and VDECS that impair safety.

A fleet owner may be granted an extension to a compliance deadline if:

- (1) Exemption from NO_x Performance Requirements. The EO will exempt the following vehicles from the NO_x requirements, but they will continue to be subject to the PM requirements.
 - (A) A NO_x mileage exempt vehicle prior to January 1, 2021.
The mileage accrued during emergency operations need not be counted in determining whether a vehicle met the definition of a NO_x mileage exempt vehicle.
 - (8) A vehicle that operates solely in the NO_x exempt area prior to January 1, 2021 except for vehicle repairs or service.
 - (C) Schoolbuses.

- (2) Exemption **for** Cab-Over-Engine (COE) Truck-Tractors. A COE truck-tractor that meets certain requirements may delay compliance until January 1, 2018. A COE that exclusively **pulls** a 57 foot trailer may delay until 2018 the requirements of the proposed regulation provided the vehicle engine is at least a 2004 model year engine and highest level PM VDECS is installed.
 - (A) Applies to COEs used exclusively to pull 57 foot trailers.
 - (8) Must still meet the PM requirements.
 - (C) Must have at least a 2004 model year engine.
 - (D) All other vehicles in the fleet must comply with the regulation.
 - (E) The provision does not apply if the length law is changed to allow longer vehicles to drive length restricted roads currently in effect.

- (3) Provisions for Unique Vehicles. The EO will not require a unique vehicle to be replaced until January 1, 2021 for which no used vehicle exists and no NO_x device is available. It must comply with the PM requirement.

- (4) Exemption for low-Use Vehicles and Three Day Pass Vehicles.
 - (A) Vehicles that drive less than 1,000 miles or operate less than 100 hours per year are exempt from the requirement of the regulation but must continue to report and keep records.
 - (8) The mileage accrued during emergency operations need not be counted in determining whether a vehicle meets the definition of a NO_x mileage exempt vehicle.
 - (C) Vehicles that exceed the 1,000 mile limit must comply with the regulation.
 - (D) Each year, a fleet may allow one vehicle within that fleet to travel in California for one single three day period per year without complying with regulation.

- (5) Exemption for Vehicles Awaiting Sale - Vehicles in dealer or financing inventories, or other companies involved in vehicle sales are exempt from the regulation.
 - (6) Exemption for Vehicles Used Solely on San Nicolas or San Clemente Islands - Vehicles operated on San Nicolas or San Clemente Islands are exempt.
 - (7) Compliance Extension Based on Early Action.
A vehicle with the highest level PM VDECS installed before January 1, 2010, can delay compliance until January 1, 2014.
 - (8) Credit for Hybrid Vehicles
 - (A) Prior to January 1, 2018, the EO will provide special treatment for hybrids that demonstrate a 20 percent or better fuel economy improvement.
 - (B) Hybrids will be counted as two vehicles when complying using the fleet-averaging option.
 - (9) Credit for Alternative Fuel Vehicles - Alternatively fueled vehicles can use the NOx emission factor for the engine for which it has been certified in calculating the NOx index and zero for the PM index.
 - (10) Compliance Extension for Emissions Control Device Manufacturer Delays: Owners will be provided extra time if a VDECS, a replacement engine, or vehicle on order did not arrive in time to comply.
 - (A) The owner and seller must have entered into contractual agreement for the purchase at least four months prior.
 - (B) The owner must identify the vehicle.
 - (C) Proof of purchase must be maintained by the owner.
 - (D) The new or retrofitted vehicles must be immediately placed into service.
 - (11) Change in Exemption Status. A vehicle that no longer qualifies for an exemption must immediately bring the fleet into compliance.
- (p) Special Provisions for VDECS and Experimental Diesel Emission Control Strategies
- (1) VDECS Requirements
 - (A) VDECS Installation. Before installing, the owner must ensure that:
 1. The VDECS is verified for use with the engine and vehicle.
 2. The conditions of the Executive Order for the VDECS are met.
 3. The VDECS is installed in a verified configuration.
 4. The engine to be retrofit meets engine manufacturer's specifications.
 5. The VDECS label will be visible after installation.
 - (B) VDECS Maintenance. VDECS must remain installed and vehicle owners must ensure that the engine is properly maintained.

- (2) Failure or Damage of a VDECS.
 - (A) Provisions for failure or Damage During the Warranty Period.
 - (B) Provisions for Failure or Damage Outside of Warranty Period.
 - (3) Provisions for Fuel-Based Strategy VDECS.
 - (4) Provisions for Use of Experimental Diesel Emission Control Strategies.
 - (5) Provisions for VDECS That Impairs Safe Operation of Vehicle - Provisions will be made for vehicles where installation of a VDECS would render a vehicle unsafe.
 - (A) Appeals - Hearing Procedures - Sets forth the appeals process
 - (B) Appeals - Hearing Conducted by Written Submission.
- (q) Reporting - This section contains the details of the reporting that is required for fleets complying using the BACT percent limits, the fleet averaging option, or the special provisions and compliance extensions. It requires vehicle, owner, VDECS, and usage information to be reported annually, in addition to any information regarding fleet changes and a certificate signed by my responsible official.
- (1) Fleets must notify the EO of the compliance option that it has selected.
 - Separate divisions **may** report separately for the different portions of the fleet.
 - (2) Each year, fleets report on their fleet as it was on January 1 of the current compliance year.
 - (3) Owner Contact Information: Compliance reports must include the listed information.
 - (4) Vehicle Information.
 - (5) Engine Information.
 - (6) Verified Diesel Emission Control Strategies.
 - (7) Availability of Highest Level VDECS
- (8) Low-Use Vehicles.
- Low-use vehicles must report the following:
- (A) Owner, vehicle, and engine information
 - (B) Odometer readings taken on January 1 and December 31 of the compliance year.
 - (C) Hour meter readings taken on January 1 and December 31 of the compliance year.
 - (D) The dates of the odometer and hour-meter readings.
 - (E) Tracking system information. Fleets may use other documentation of operation and location, such as IRP records.
- (9) Vehicles in Agricultural Fleets.
- Agricultural fleet owners must report vehicle information by January 31, 2009 until January 1, 2023:
- (A) Information required in the general reporting section.
 - (B) What type agricultural vehicle is being claimed or none.
 - (C) Which specialty vehicle is being claimed.

- (D) Odometer readings taken on January 1, 2011 and every January 1 thereafter.
 - (E) Vehicle being replacement information.
- (10) **Vehicles used in emergency operation** - Emergency vehicle qualifying information.
- (11) **Vehicles Exempt from the NOx Performance Standard.**
- (A) Exemption Based on Early Action - Early action qualifying information.
 - (B) NOx Mileage Exempt Vehicles - NOx mileage exemption qualifying information
- (12) **Compliance Certification** - Reports submitted include a written statement signed by the responsible official assuring the accuracy of the reports.
- (13) **Changes Since Last Reporting** - Requires reporting of any additions, deletions, or changes to the fleet since the last report filed.
- (14) **New Fleet Reporting.** New fleets that elect to utilize the BACT percent limits or the fleet averaging option must report their vehicles within 30 days.
- (r) Record Keeping - This section contains the record keeping requirements **and** the requirement to make the available to an ARB employee if requested. Records include bills of lading, proof of vehicle type, proof of transference of ownership, and information about VDECS failures if applicable.
- (1) Fleets shall maintain the records and make them available upon request.
 - (2) Fleets **shall** keep copies of reported information.
 - (3) Motor Carrier or Broker
 - (A) Must keep bills of lading and other documentation.
 - (4) **Agricultural** Fleets
 - (A) Proof that all low, limited, and specialty agricultural vehicles were used exclusively in agricultural operations.
 - (B) Records demonstrating that each vehicle was operational, functional and capable of performing the duty for which it was designed.
 - (C) Bills of lading for delivery of fertilizer or crop protection products.
 - (D) Proof of transference of ownership.
 - (E) Proof of ownership.'
 - (5) Changes Since Last Reporting Period.
 - (6) Electronic Tracking - For fleets using electronic tracking systems, summary and detailed records
 - (7) VDECS Failure - Maintain records of any VDECS failure and replacement.
 - (8) Fuel-based Strategy - Documentation of any approval by the EO.
 - (9) Experimental Diesel Emission Control Strategy.
 - (10) Manufacturer Delay.
 - (11) Maintenance of VDECS Records
 - (A) VDECS Documentation.

1. Installer statement affirming proper installation of the VDECS and all other relevant information.

- (s) Audit of Records - Owners must make records available to **ARB** at its request.
- (t) Record **Retention** - Owners must maintain records for 3 years.
- (u) Right of Entry - An agent or employee of ARB has the right to enter any facility.
- (v) Disclosure of Regulation Applicability - Sellers of vehicles must make buyers aware of this regulation.
- (w) Compliance Requirement - Details the general compliance requirements, compliance requirements for motor carriers and **brokers**, and Certificate of Reported Compliance, and lease contracts.
 - (1) Requires vehicle owners to comply with all applicable requirements and compliance schedules.
 - (2) Requires motor carriers and brokers to verify that any vehicle hired or dispatched complies with requirements of the regulation.
 - (3) Provides a mechanism through which fleets can demonstrate reported compliance.
 - (4) Requires lease contracts with an effective dates later than January 1,2010 to specify in which fleet the vehicle will reside.
- (x) ARB Certificate of Reported **Compliance** - A certification of reported compliance will be issued upon receipt of a report indicating compliance.
- (y) Non-Compliance.
- (z) Severability

Appendix B'

Proposed Amendments to Existing Diesel Regulations

TABLE OF CONTENTS

Section 2020	Purpose and Definitions of Diesel Particulate Matter Control Measures	8-1
Section 2022	Diesel Particulate Matter Control Measure for Municipality or Utility On-road Heavy-duty Diesel-fueled Vehicles	8-2
Section 2022.1	Determining Compliance for a Municipality or Utility	8-5
Section 2027	In-Use On-Road Diesel-Fueled Heavy-Duty Drayage Trucks	8-23
Section 2449	General Requirements for In-Use Off-Road Diesel-Fueled Fleets	8-41
Section 2479	Regulation for Mobile Cargo Handling Equipment at Port and Intermodal Rail Yards	8-47
Section 2456	Portable Engine and Equipment Registration	8-57
Section 93116	Airborne Toxic Control Measure for Diesel Particulate Matter from Portable Engines Rated at 50 Horsepower or Greater	8-97
Section 2485	Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling	8-113
Section 1956.8	Exhaust Emissions Standards and Test Procedures - 1985 and Subsequent Model Heavy-Duty Engines and Vehicles	8-121

PROPOSED REGULATION ORDER

DIESEL PARTICULATE MATTER CONTROL MEASURE FOR ON-ROAD HEAVY-DUTY DIESEL-FUELED VEHICLES OWNED OR OPERATED BY PUBLIC AGENCIES AND UTILITIES

Note: Proposed amendments are shown in underline to indicate additions and strikeout to indicate deletions, compared to the preexisting regulatory language.

Amend section 2020, 2022, and 2022.1, title 13, California code of Regulations to read as follows.

§ 2020. Purpose and Definitions of Diesel Particulate Matter Control Measures.

- (a) Purpose. Diesel particulate matter was identified in 1998 as a toxic air contaminant. According to California law, an airborne toxic control measure using the best available control technology shall, therefore, be employed to reduce the public's exposure to diesel particulate matter.
- (b) Definitions. For the purposes of the rules specified in article 4, the following definitions apply:

"**Alternative fuel**" means natural gas, propane, ethanol, methanol, gasoline (when used in hybrid electric buses only), hydrogen, electricity, fuel cells, or advanced technologies that do not rely on diesel fuel. "Alternative fuel" also means any of these fuels used in combination with each other or in combination with other non-diesel fuels.

"Commercially available" means available for purchase and installation at a reasonable cost.

"Heavy-duty pilot ignition engine" means an engine designed to operate using an alternative fuel, ~~except~~ that diesel fuel is used for pilot ignition at an average ratio of no more than one part diesel fuel to ten parts total fuel on an energy equivalent basis. An engine that can operate or idle solely on diesel fuel at any time does not meet this definition.

"Level" means one of three categories of Air Resources Board-verified diesel emission control strategies: Level 1 means the strategy reduces engine diesel particulate matter emissions by between 25 and 49 percent, Level 2 means the strategy reduces engine diesel particulate matter emissions by between 50 and 84 percent, and Level 3 means the strategy reduces engine diesel particulate matter emissions by 85 percent or greater, or reduces engine emissions to less than or equal to 0.01 grams diesel particulate matter per brake horsepower-hour.

"Municipality" means a city, county, city and county, special district, or a public agency of the United States of America or the State of California, and any department, division, public corporation, or public agency of this State or ~~of~~ the

United States, or two or more entities acting jointly, or the duly constituted body of an Indian reservation or ranoheria.

"Owner" means the same as in title 13, California Code of Regulations, section 2180.1 (a)(245).

"Transit agency" means a public entity responsible for administering and managing transit services. Public transit agencies can directly operate transit service or contract out for all or part of the total transit service provided.

"Terminal" means any place or places where a vehicle is regularly garaged or maintained, or from which it is operated or dispatched, which may include a private business or residence.

"Verified" means that a diesel emission control strategy or system has received approval from the Executive Officer according to the "Verification Procedure for In-Use Strategies to Control Emissions from Diesel Engines" in title 13, California Code of Regulations, commencing with section 2700, and incorporated by reference.

"warranty Period" means the same as in title 13, California Code of Regulations, section 2707.

NOTE: Authority cited: Sections 39600 and 39601, Health and Safety Code.
Reference: Sections 39002, 39003, 39650 - 39675, 43000, 43013, 43018, 43101, 43102, 43104, 43105 and 43700, Health and Safety Code.

§ 2022. Diesel Particulate Matter Control Measure for Municipality or Utility On-Road Heavy-duty Diesel-Fueled Vehicles.

- (a) Scope and Applicability. Sections 2022 and 2022.1 apply to any municipality or utility that owns, leases, or operates an on-road diesel-fueled heavy-duty vehicle with either a 1960 to 2006 model-year medium heavy duty or heavy heavy-duty engine or a 2007 model-year or newer engine certified to greater than 0.01 grams per brake horsepower-hour particulate emission standard and manufacturer's gross vehicle weight rating greater than 14,000 pounds. These sections do not apply to a vehicle subject to the solid waste collection vehicle rule commencing with title 13, California Code of Regulations, section 2021 or to the fleet rule for transit agencies commencing with section 2023, or to a school bus as defined in Vehicle Code section 545, or to a military tactical support vehicle, as described in title 13, California Code of Regulations, section 1905, or to an emergency vehicle as described in California Vehicle Code, section 27156.2, or to an off-road vehicle as described in title 13, California Code of Regulations, sections 2401, 2421, 2411 and 2432.
- (b) Definitions. The definitions in section 2020 shall apply to sections 2022, and 2022.1. In addition, the following definitions apply only to sections 2022, and 2022.1.

(1) "Dedicated Snow Removal Vehicle" means a vehicle that has permanently affixed snow removal equipment such as a snow blower or auger and is operated exclusively to perform snow removal operations.

(2) "Dual Engine Street Sweeper" means an on-road heavy-duty vehicle, over 14,000 pounds gross vehicle weight rating, that is used for the express purpose of removing material from road surfaces, by mechanical means through the action of one or more brooms, or by suction through a vacuum or regenerative air system or any combination of the above. A dual engine street sweeper has an engine to propel the vehicle and an auxiliary engine to power the broom or vacuum.

(3) "Lease" means to operate a vehicle that is owned by a rental or leasing company for a period of one year or more.

~~(2)~~(4) "Low-Population County" means a county with a population of less than 125,000, based upon the California Department of Finance estimates as of July 1, 2005, and as listed in Table 2 of title 13, California Code of Regulations section 2022.1.

~~(3)~~(5) "Low Usage Vehicle" means a vehicle that is operated for fewer than 1000 miles or 50 hours per year, based on a 5 year rolling mileage or engine-hour average. A vehicle that does not have a properly functioning odometer, tachograph, or other reliable device to measure usage may not qualify as a low usage vehicle.

~~(4)~~(6) "Low-Population County Low Usage Vehicle" means a vehicle that is owned or operated by a municipality or utility located in a low-population county and is operated, based on a 5 year rolling mileage or engine hour average for fewer than 3000 miles or 150 hours, excluding mileage or engine hours used during snow removal operations. A vehicle that does not have a properly functioning odometer, tachograph, or other reliable device to measure usage may not qualify as a low-population county low usage vehicle.

(7) "Operate" means to use or manage a vehicle by a municipal or utility employee for the purposes of conducting work by or for the municipality or utility. This does not include personal vehicle use for commuting to or from the workplace.

~~(5)~~(8) "Retirement" or "Retire" means the withdrawal of an engine or vehicle subject to this rule from a municipality or utility fleet in California; the engine may be sold outside the State of California, scrapped, converted for use in a low usage vehicle or low-population county low usage vehicle. "Retirement" or "retire" also means the transfer of an engine or vehicle, which is Subject to this rule and has been brought into compliance with title 13, California Code of Regulations, section 2022.1 (b), from a municipality or utility fleet in California to another person or entity in California. In addition, "retirement" means the sale of a dual engine street sweeper with a model year engine of 2004, 2005, or 2006 in the State of California to a buyer who must comply with title 13, California Code of Regulations, section 2025.

(9) "Sold Outside of the State of California" means a sale of a vehicle for operation outside the State of California to satisfy the definition of "retirement" in section

2022(b)(8). A municipality or utility must submit a completed "VIN stop" application, as defined in title 13, California Code of Regulations, section 2022(b)(10), to the Executive Officer prior to sale of the vehicle. ARB will obtain VIN Stop from Department of Motor Vehicles. A municipality or utility must also follow the record-keeping requirements as defined in title 13, California Code of Regulations, section 2022(f)(1)(K). If a municipality or utility is selling a vehicle through a Third Party Vehicle Seller, it must include Third Party Vehicle Seller contract language as defined in title 13, California Code of Regulations, section 2022(h).

(10) "Third Party Vehicle Seller" means a person that a municipality or utility uses to sell a vehicle outside of the State of California.

~~(6)~~(11) "Total Fleet" means the total of a municipality's or utility's on-road heavy-duty vehicles with a 1960 to 2006 model-year medium heavy-duty or heavy heavy-duty engine and a manufacturer's gross vehicle weight rating greater than 14,000 pounds, excluding low usage vehicles; low-population county, low usage vehicles; dedicated snow-removal vehicles; and gasoline fueled vehicles.¹ As of January 1, 2009, "Total Fleet" means the total of a municipality's or utility's on-road heavy-duty vehicles with a manufacturer's gross vehicle weight rating greater than 14,000 pounds with a 1960 to 2006 model-year heavy-duty engine or with a 2007 model-year or newer heavy-duty engine certified to greater than 0.01 grams per brake horsepower-hour particulate emission standard, excluding low usage vehicles; low-population county, low usage vehicles; dedicated snow-removal vehicles; and gasoline fueled vehicles.

~~(7)~~(12) "Utility" means a privately-owned company that provides the same or similar services for water, natural gas, and electricity as a public utility operated by a municipality.

~~(8)~~(13) "Vehicle Type" means one of the following categories: "Compliant" for those vehicles that meet the requirements of section 2022.1 (b); "Future Compliant" for those vehicles for which the municipality or utility has a planned compliance date; "Retired" for those vehicles that will meet the definition of "retirement" at a planned retirement date; "Low Usage or Low-Population County Low Usage" for those vehicles that meet the applicable definitions in this section; and "Experimental" for those vehicles that are part of an experimental program and comply with the provisions of section 2022.1 (d)(5).

(14) "VIN stop" means a Department of Motor Vehicle's registration hold based on a vehicle identification number to prevent a vehicle from being re-registered in California after a vehicle is "retired."

NOTE: Authority cited.: Sections 39600 and 39601, Health and Safety Code. Reference: Sections 39002, 39003, 39655, 39656, 39657, 39658, 39659, 39660, 39661, 39662, 39664, 39665, 39667, 39669, 39674, 39675, 43000, 43013, 43018, 43101, 43102, 43104, 43105, and 43700, Health and Safety Code.

¹ Gasoline vehicles that do not meet the best available control technology (BACT) requirements specified in title 13, California Code of Regulations, section 2022.1 (b)(3) are excluded from the total fleet calculation.

§ 2022.1. **Determining Compliance for a Municipality or Utility.**

- (a) **Compliance Requirements.** Beginning with the applicable effective dates, a municipality or utility is required to comply with this diesel particulate matter control measure for each vehicle in its total fleet. Compliance requires all of the following:
- (1) Use of a best available control technology for each vehicle in the total fleet as specified in subsection (b);
 - (2) Implementation for each vehicle in the total fleet as specified in subsection (c);
 - (3) If a compliance deadline extension is granted by the Executive Officer per subsection (d), the municipality or utility shall be deemed to be in compliance as specified by the Executive Officer's authorization;
 - (4) Special circumstances must be followed as specified in subsection (e);
 - (5) Records must be kept as specified in subsection (f); and
 - (6) Continuous compliance: municipality or utility is required to keep each vehicle in compliance with this regulation, once it is in compliance, so long as the municipality or utility is operating the vehicle in California.
- (b) **Best Available Control Technology.** Each municipality or utility shall use one of the following best available control technologies on each applicable vehicle in its total fleet as required by the implementation schedule in subsection (c):
- (1) An engine or power system certified to the optional 0.01 grams per brake horsepower-hour (g/bhp-hr) particulate emission standard as specified in title 13, California Code of Regulations, section 1956.8(a)(2), or the 0.01 g/bhp-hr particulate emission standard as specified in title 13, California Code of Regulations, section 1956.8(a), as appropriate for the engine's model-year; or
 - (2) An engine or power system certified to the 0.10 g/bhp-hr particulate emission standard, as specified in title 13, California Code of Regulations, section 1956.8, used in conjunction with the highest level diesel emission control strategy as defined in subsection (b)(4) applied by the implementation schedule in subsection (c); or
 - (3) An alternative fuel engine, heavy-duty pilot ignition engine, or gasoline engine; model-year 2004-2006 alternative fuel engines must be certified to the optional, reduced emission standards as specified in title 13, California Code of Regulations, section 1956.8 (a)(2)(A); gasoline engines must be certified to the emission standards as specified in title 13, California Code of Regulations, for heavy-duty Otto-cycle engines used in heavy-duty vehicles

over 14,000 pounds gross vehicle weight, sections 1956.8(c)(1)(8) and 1976(b)(1)(F); or

- (4) The highest level diesel emission control strategy per title 13, California Code of Regulations, section 2702 (f), Table 1, that is verified for a specific engine to reduce diesel particulate matter and which the diesel-emission-control strategy manufacturer or authorized dealer agrees can be used on a specific engine and fleet-vehicle combination, without jeopardizing the original engine warranty in effect at the time of application.

(c) Implementation Schedule.

- (1) A municipality or utility shall comply with the schedule in Table 1 - Implementation Schedule for a Municipal and Utility Total Fleet Vehicle, 1960 to 2006 and newer Model-Year Engines for the specified percentage of vehicles by each applicable compliance deadline.

Table-1 - Implementation Schedule for a Municipal and Utility Total Fleet Vehicle, 1960 to ~~2006~~ and newer Model-Year Engines.

<i>Group</i>	<i>Engine Model- Years</i>	<i>Percentage of Group to Use Best Available Control Technology</i>	<i>Compliance Deadline, As of December 31</i>
1 ⁸	1960 -1987	20	2007
		60	2009
		100	2011
2	1988 -2002	20	2007
		60	2009
		100	2011
3	2003 - 2006 (Includes dual-fuel and bi-fuel engines)	50	2009
		100	2010
<u>4</u>	2007 and newer certified above the 0.01g/bhp-hr std.	100	2012

⁸ An owner may not use Level 1 technology, as classified pursuant to title 13, California Code of Regulations section 2700, as best available control technology on a Group 1 engine or vehicle.

- (2) Municipality or Utility Located in a Low-Population County. A municipality or utility that is headquartered in a county in Table 2 may elect to follow the option in Table 3 below in lieu of the implementation schedule in Table 1.

Table 2 - Low-Population Counties

<i>COUNTY</i>	<i>Population as of July 1, 2005</i>
ALPINE	1,300
AMADOR	37,600
CALAVERAS	47,800
COLUSA	24,200
DEL NORTE	31,500
GLENN	31,800
INYO	18,800
LAKE	69,200
LASSEN	39,800
MARIPOSA	19,600
MENDOCINO	95,500
MODOC	10,100
MONO	14,200
NEVADA	106,300
PLUMAS	21,900
SAN BENITO	63,600
SIERRA	3,700
SISKIYOU	47,200
SUTTER	90,400
TEHAMA	63,400
TRINITY	13,800
TUOLUMNE	62,200
YUBA	66,000

Table 3 - Implementation Schedule for a Municipality or Utility Located in a Low-Population County or Granted Low-Population County Status

<i>Group</i>	<i>Engine Model-Years</i>	<i>Percentage of Group to Use Best Available Control Technology</i>	<i>Compliance Deadline, as of December 31</i>
1	1960 - 1987	20	2009
		40	2011
		60	2013
		80	2015
		100	2017
2	1988 - 2002	20	2008
		40	2010
		60	2012
		80	2014
		100	2016
3	2003 -2006 (Includes dual-fuel and bi-fuel engines)	20	2011
		40	2012
		60	2013
		80	2014
		100	2015
4	2007 and newer certified above the 0.01g/bhp-hr std.	20	2012
		40	2013
		60	2014
		80	2015
		100	2016

- (3) *Accelerated Turnover Option for Municipality or Utility Located in a Low-Population County.* A municipality or utility headquartered in a county listed in Table 2 may elect to follow the option in Table 4 below in lieu of the implementation schedules in Table 1 or 3.

Table 4 - Accelerated Turnover Option for a Municipality or Utility Located in a Low-Population County

<i>Engine Model-Year</i>	<i>Fleet Percent to Repower with a 1994 or newer engine</i>	<i>Compliance Date as of Dec 31</i>	<i>Percent of Fleet to use BACT</i>	<i>Compliance Date as of Dec 31</i>
1960 -1993	100%	2020	100%	2025
1994 —2006 and newer	N/A	N/A	100%	2025

- (4) A municipality or utility not specifically listed in Table 2 may apply to the Executive Officer for consideration as a fleet located in a designated "low-population county." The Executive Officer shall issue that designation provided that all of the following criteria are met:
- (A) The total fleet is located in a "nonurbanized area," a "rural and small urban area," or any area outside of an urbanized area, as designated by the U.S. Bureau of the Census. An urbanized area consists of a core area and the surrounding densely populated area with a total population of 50,000 or more, with boundaries fixed by the Bureau of the Census or extended by state and local officials; or
 - (B) The fleet is located in a county that, as of July 1, 2005, has a population of less than 325,000 and meets the definition of a low-population county when the population of one or more cities that have their own municipal vehicle fleet are subtracted from the county population, and the fleet does not operate within those cities' boundaries; and
 - (C) The fleet revenue is not based on special district assessments or fees.
- (5) Calculating Number of Total Fleet Vehicles Required for Implementation.
- (A) As of January 1 of each year where a compliance deadline is applicable, a municipality or utility shall calculate, for each engine model-year group, the number of vehicles in its total fleet for which compliance will be required. This fleet size by engine model-year group (#MUVbygroup)² must be calculated using the following equation:

$$\#MUVbygroup = \# VehicleSbygroup + TotRetirebygroup$$

Where:

#Vehiclesby group = the number of vehicles in an engine model-year group subject to the rule, and

TotRetireby group = the number of vehicles removed from the model-year group by retirement in prior years, beginning with January 1 of the initial applicable compliance deadline year for each group.

If a vehicle has left the total fleet for reasons other than retirement, it must not be included in the calculation of #MUVby group.

- (B) The municipality or utility shall use the following equation to determine the total number of vehicles in an engine model-year group that are

² "By group" means all vehicles in an engine model-year group as described in Table 1 under (c)(1).

required to be in compliance by the deadline in Table 1
(TotVehby group):

$$TotVehbygroup = Group\%BACTbygroup \times \#MUVbygroup$$

Where:

Group%BACTby group = the percentage of vehicles in an engine model-year group that must meet BACT requirements for a given year as specified in subsection (c), and

#MUVbygroup = the total fleet size by engine model-year group as defined in paragraph (5)(A) above

- (C) After the first compliance deadline for each group, the municipality or utility shall determine the number of additional vehicles in each model-year group to be brought into compliance each year that a compliance deadline is applicable (TotAddCompbygroup). The following equation must be used to calculate TotAddCompbygroup:

$$TotAddCompbygroup = TotVehbygroup - TotBACTbygroup - TotRefirebygroup$$

Where:

TotVehby group = the total number of vehicles in an engine model-year group required to be in compliance, as defined in paragraph (5)(B) above,

TotBactbY group = the number of vehicles in an engine model-year group that have been brought into compliance since the earliest compliance deadline using the method listed in subsection (b), and

TotRetirebygroup = the number of vehicles retired in prior years as defined in paragraph (5)(A) above

If a vehicle has left the total fleet for reasons other than retirement, it must not be included in the calculation of TotAddCompby group.

- (0) Notwithstanding subsection (C) above, in the 100 percent compliance deadline year for each engine model-year group, the municipality or utility shall bring the remaining vehicles into compliance.
- (E) If the TotVehbY group or TotAddCompby group is not equal to a whole number, the municipality or utility shall round up a whole number when the fractional part of TotAddCompby group is equal to or greater than 0.5, and round down if less than 0.5.
- (d) Compliance Extensions. A municipality or utility may be granted an extension to a compliance deadline specified in subsection (c) for one of the following reasons:

- (1) Compliance Extension Based on Early Implementation. A municipality or utility may be granted an extension based on compliance with one or more of the following early implementation schedules, provided the Executive Officer has received a letter by the applicable early compliance deadline stating the municipality's or utility's intent to comply with one of the following conditions and meets the requirements set forth in paragraphs (A), (B), (C) or (D).
- (A) If a municipality or utility has implemented best available control technology on fifty percent or more of its Group 1 vehicles in its total fleet by December 31, 2007, then the municipality or utility may delay the intermediate and final compliance deadlines for the remaining Group 1 vehicles to July 1, 2012.
 - (B) If a municipality or utility has implemented best available control technology on fifty percent or more of its Group 2 vehicles in its total fleet by December 31, 2007, then the municipality or utility may delay the intermediate and final compliance deadlines for the remaining Group 2 vehicles to July 1, 2012.
 - (C) If a municipality or utility has implemented BACT on 100 percent of its Group 1 and Group 2 engines by December 31, 2008, then the municipality or utility may follow the alternate implementation schedule for its Group 3 engines of 20 percent BACT by December 31, 2009, 60 percent BACT by December 31, 2011 and 100 percent BACT by December 31, 2012.
 - (D) If a municipality or utility employs significant quantities of advanced technology vehicles (for example, hybrid electric vehicles) to meet BACT requirements, then the municipality or utility may **apply** to the Executive Officer for approval of a longer implementation schedule for its Group 2 and Group 3 vehicles, or approval of credits to be used towards BACT compliance. The longer implementation schedule must be proportionate to the additional emissions benefits from the use of the advanced technology vehicles, and BACT credits cannot exceed the additional emissions benefits. The advanced technology vehicles must meet or exceed MY 2007 and later emissions standards and significantly reduce greenhouse gas emissions and petroleum use.
- (2) Compliance Extension **Based** on No Verified Diesel Emission Control Strategy. If the Executive Officer has not verified a diesel emission control strategy, or one is not commercially available, for a particular engine and vehicle combination, an annual extension in compliance may be granted by the Executive Officer under one of the conditions specified below:
- (A) Executive Officer Compliance Extension. The Executive Officer shall grant a blanket one-year compliance extension if a diesel emission,

control strategy is not verified for an engine ten months prior to each compliance deadline specified in subsection (c).

1. For a Group 1 engine for which there is no verified diesel emission control strategy, the Executive Officer shall grant a one-year extension, after which the municipality or utility shall comply with subsection (b). If no diesel emission control strategy for the engine is verified during the extension period, the Executive Officer shall grant an additional one year extension. The Executive Officer may grant one-year extensions until December 31, 2012, (or December 31, 2018 for a municipality or utility located in a low-population county, or granted low-population county status), after which the municipality or utility shall comply with subsection (b).
 2. For a Group 2 engine for which there is no verified diesel emission control strategy, the Executive Officer shall grant a one-year extension, after which the municipality or utility shall comply with subsection (b). If no diesel emission control strategy for the engine is verified during the extension period, the Executive Officer shall grant an additional one-year extension. The Executive Officer may grant one-year extensions until December 31, 2012, (or December 31, 2017 for a municipality or utility located in a low-population county), after which the municipality or utility shall comply with subsection (b)
- (B) Municipality or Utility Application for Compliance Extension. A municipality or utility may apply to the Executive Officer for a compliance extension pursuant to subsection (d) for an engine no later than July 31 prior to each compliance deadline specified in subsection (c). Before requesting this extension, the municipality or utility shall demonstrate compliance or intent to comply with applicable deadlines for the remaining vehicles in the fleet. The municipality or utility shall meet the following application conditions and documentation requirements by providing the following to the Executive Officer:
1. Identification of each engine, by vehicle identification number; engine manufacturer, model-year, family, and series; and type of vehicle for which no diesel emission control strategy has been verified; or
 2. Identification of each engine, by vehicle identification number; engine manufacturer, model-year, family, and series; and type of vehicle for which a specific diesel emission control strategy would void the original engine warranty and a statement from the engine manufacturer or authorized dealer stating the original engine warranty would be voided; or

3. Identification of each engine and vehicle combination, by vehicle identification number; engine manufacturer, model-year, family, and series; and type of vehicle for which no diesel emission control strategy is commercially available and a list of manufacturers that have been contacted, with the manufacturers' responses to a request to purchase; and
 4. A description of the reason for the request for a compliance extension for each engine or engine and fleet-vehicle combination; and
 5. A copy of the statement of compliance as required in subsection (f)(1)(K); and
 6. The application for compliance extension to be submitted to the Executive Officer no later than July 31 annually beginning 2007.
 - a. A municipality or utility. For a Group 1 engine, the Executive Officer will accept an annual compliance-extension application until July 31, 2011, after which the municipality or utility shall comply with subsection (b) by December 31, 2012. The Executive Officer will only grant one compliance extension for an engine in Group 1. For a Group 2 engine, the Executive Officer will accept an annual compliance extension application until July 31, 2011, after which the municipality or utility shall comply with subsection (b) by December 31, 2012.
 - b. A municipality or utility either located in a low-population county, or granted low-population county status. For a Group 1 engine, the Executive Officer will accept an annual compliance extension application until July 31, 2017, after which the municipality or utility shall comply with subsection (b) by December 31, 2018. The Executive Officer will only grant one compliance extension for an engine in Group 1. For a Group 2 engine, the Executive Officer will accept an annual compliance extension application until July 31, 2016, after which the municipality or utility shall comply with subsection (b) by December 31, 2017..
- (3) Compliance Extension for a Municipality or Utility that Operates a Dual-Fuel or Bi-Fuel Engine. A municipality or utility may delay implementation of a Group 1 or 2 dual-fuel or bi-fuel engine to the Group 3 compliance deadlines.
- (4) Compliance Extension for an Engine Near Retirement. If a municipality or utility has applied best available control technology to all engines as required, and the next engine subject to implementation under subsection (c) is scheduled to be retired from the total fleet within one year

of the applicable compliance deadline, then the municipality or utility shall be exempted from applying the best available control technology as defined in subsection (b) to that engine for a maximum of one year, provided documentation of the expected retirement date is kept in records as specified in subsection (f) and the engine is retired by the stated anticipated date.

- (5) Use of Experimental Diesel Emission Control Strategy. A municipality or utility may use an experimental diesel emission control strategy provided by, or operated by, the manufacturer in no more than 20 vehicles, or ten percent of its total fleet, whichever is less, for testing and evaluation purposes. The municipality or utility shall keep documentation of this use in records as specified in subsection (f). Each vehicle will be considered to be in compliance for the duration of the experiment to a maximum of two years. The municipality or utility must bring the vehicle into compliance within six months of the end of the testing and evaluation period. No experimental diesel emission control strategy may be used on a vehicle after December 31, 2012.
- (6) Accelerated Turnover Option. A municipality or utility either located in a low-population county or granted low-population county status may follow the accelerated turnover option provided in subsection (c)(3), provided the Executive Officer has received a letter by July 31, 2008, stating the municipality's or utility's intent to comply with this option.
- (7) Light Heavy-Duty Engine Extension. A municipality or utility may apply for a one year extension from the 2009 compliance deadline for light heavy-duty engines if after counting light heavy-duty engines as a part of the total fleet prevents the fleet from complying with the 2009 intermediate BACT compliance requirements in section 2022.1 (c)(1). A municipality or utility must:
- (A) Submit a letter to the Executive Officer by August 1, 2009 requesting the light heavy-duty engine extension:
 - (B) Submit documentation to demonstrate it cannot comply with the 2009 intermediate BACT compliance requirements in section 2022(c)(1) after adding light heavy-duty engines as a part of the total fleet size. Documentation shall include, but is not limited to, proof of financial hardship, budgeting schedules, etc: Documentation of financial hardship shall include an analysis of cost of compliance, sources of available funds and shortfall between funds available and cost of compliance: and
 - (C) Meet the record-keeping requirements under section 2022.1 (t).

- (8) Privately-Owned Utility Extension. A utility may be granted an extension for Group 2 and Group 3 intermediate and final compliance deadlines as required in section 2022.1 (c)(1) by two years, provided that thirty (30) percent of its fleet vehicles meet the 2010 engine emission standards, and twenty (20) percent of its fleet vehicles meet the 2007 or newer engine emission standards by December 31, 2013. A privately-owned utility must:
- (A) submit a letter to the Executive Officer by December 31, 2009, stating the utility's intent to comply with this section,
 - (B) submit records by December 31, 2009 required by section 2022.1
 - (C) label each vehicle in its fleet according to section 2022.1(f)(3)(G),
 - (D) submit by December 31, 2011 records required by section
 - (E) submit by December 31, 2013 records required by section 2022.1 (f)(1) and documentation, such as but not limited to percent of fleet calculations and purchase records, demonstrating the utility's compliance with the *above* conditions.
- (e) Diesel Emission Control Strategy Special Circumstances. A municipality or utility shall maintain the original *level* of best available control technology on each engine once that engine is in compliance, and will not be required to upgrade to a higher *level* of best *available* control technology, except under specified special circumstances, as follows:
- (1) Fuel Strategy Diesel Emission Control Strategy.
 - (A) If a municipality or utility determines that the highest level diesel emission control strategy for a small percentage of its fleet would be a *level 2* fuel-based strategy, and implementation of this diesel emission control strategy would require installation of a dedicated storage tank, then the municipality or utility shall request prior approval from the Executive Officer to allow use of a lower *level* diesel emission control strategy; or
 - (B) If a municipality or utility elects to use a fuel-based diesel emission control strategy across its fleet, and some vehicles can use a *level 3* hardware diesel emission control strategy, then the municipality or utility shall request prior approval from the Executive Officer to allow use of a lower *level* diesel emission control strategy. This provision is only available if a minimum level 2 diesel emission control strategy is used.

- (2) *Diesel Emission Control Strategy Failure or Damage.* In the event of a failure or damage of a diesel emission control strategy, the following conditions apply:
- (A) *Failure or Damage During the Warranty Period.* If a diesel emission control strategy fails or is damaged within its warranty period and the diesel emission control strategy manufacturer or authorized dealer determines it cannot be repaired, the municipality or utility shall replace the diesel emission control strategy with either the same level diesel emission control strategy or another best available control technology as defined in subsection (b).
- (8) *Failure or Damage Outside of Warranty Period.* If a diesel emission control strategy fails or is damaged outside of its warranty period, and it cannot be repaired, the municipality or utility shall apply the best available control technology at the time of replacement, as defined in subsection (b).
- (3) *Discontinuation of Fuel Verified as a Diesel Emission Control Strategy.* If a municipality or utility discontinues use of a fuel verified as a diesel emission control strategy, the municipality or utility shall apply best available control technology within 30 days of the date of discontinuation or submit a compliance plan to the Executive Officer no later than 30 days after discontinuation that demonstrates how the municipality or utility will bring the vehicles into compliance within six months of the date of discontinuation.
- (4) *Limited Use of Level 1 Diesel Emission Control Strategy.* If a Level 1 diesel emission control strategy is identified as the best available control technology pursuant to subsection (b), a municipality or utility is subject to the following limitations:
- (A) Group 1
1. A municipality or utility may not use a Level 1 diesel emission control strategy on any Group 1 engine.
 2. *Exception for low-population counties.* The limitation in (A)1. does not apply to a vehicle owned or operated by a municipality or utility located in a low-population county (Table 2), or to a vehicle owned or operated by a municipality or utility that has been granted low-population county status.
- (8) Group 2
1. *Ten year limit.* A municipality or utility may use a Level 1 diesel emission control strategy in a Group 2 engine for up to ten years. The municipality or utility shall then replace the Level 1 diesel emission control strategy with the best available control

technology from subsection (b). The replacement cannot be a **Level 1** diesel emission control strategy.

2. Exception for low-population counties. The limitation in (B)1. does not apply to a vehicle owned or operated by a municipality or utility located in a low-p'opulation county (Table 2) or to a vehicle owned or operated by a municipality or utility that has **been** granted low-population county status.

(C) Group 3 and 4

1. Five year limit. A municipality or utility may use a Level 1 diesel emission control strategy in a Group 3 and 4 engine for up to five years. The municipality or utility shall then replace the Level 1 diesel emission control strategy with the best available control.technology from subsection (b). The replacement cannot be a Level 1 diesel emission control strategy.
2. Exception for low-population counties. The limitation in (C)1. does not apply to a vehicle owned or operated by a municipality or utility located in a low-population county (Table 2) or to a vehicle owned or operated by a municipality or utility that has been granted low-population county status.

(f) Record:Keeping ReqUirement. A municipality or utility shall maintain the following records. The municipality or utility shall provide the following records upon request to an agent or employee of the Air Resources Board for all vehicles in its total fleet subject to compliance with this regulation.

- (1) Records to be Kept For Inspection. Beginning December 31, 2007, the municipality or utility shall keep the following records either in hard-copy format or as computer records:
 - (A) A list by vehicle identification number of vehicles, identifying each vehicle type; engine manufacturer, model-year, family, and series; and status as a total fleet or low usage vehicle; and
 - (B) Correlated to each vehicle, the installed diesel emission control strategy family name, its serial number, manufacturer, installation date, and if using a Level 1 or Level 2 verified diesel emission control strategy, the reason for the choice; and
 - (C) Records of maintenance for each installed diesel emission control strategy; and
 - (D) For fuel or fuel additives used as a diesel emission control strategy, the most recent two years' worth of records of purchase that demonstrate usage; and

- (E) For each low usage vehicle, or low-population county low usage vehicle, its mileage or engine hours as of December 31 of each year beginning 2007, and records to document its five-year mileage or engine hours, as of December 31 of each year beginning 2007, correlated to the vehicle identification information in paragraph (1)(A) above; and
- (F) If a municipality or utility is located in a low-population county or has been granted low-population county status, documentation affirming that the vehicle is not operated at any time in a metropolitan statistical area as defined by the U.S. Census Bureau; and
- (G) For each engine for which a municipality or utility is claiming an extension pursuant to paragraph (d)(4), the retirement date correlated to the vehicle identification information in paragraph (1)(A) above; and
- (H) For each engine for which a municipality or utility is claiming an extension pursuant to paragraph (d)(5), the records of the test plan, including start and end dates of the experiment; diesel emission control strategy manufacturer name and contact information (representative, address, and phone number); name and type of experimental diesel particulate matter emission control strategy; and targeted data to be generated by experiment and correlated to the vehicle identification information in paragraph (1)(A) above; and
- (I) For each engine for which a municipality or utility located in a low-population county is following the accelerated turnover path in Table 3, the date of each engine repower correlated to the vehicle identification information in paragraph (1)(A) above; and
- (J) Records to document the retirement of a vehicle. For each vehicle or engine to be retired, list the vehicle identification number, engine manufacturer, model-year, family, and series. For each vehicle that will be transferred to another fleet in California, include also the information required by sections 2022.1 (f)(1)(B) and a statement of compliance that the vehicle meets the provisions of section 2022.1 (b). For each vehicle or engine to be retired, provide the date of retirement, and written confirmation from the recipient of the retired vehicle or engine that the destination of the vehicle or its engine meets the requirements of the definition of "retirement" or "retire" in section 2022(b).
- (K) Vehicles sold outside of the State of California. For a vehicle to qualify for retirement. a municipality or utility must:
 1. Submit to the Executive Officer a completed VIN Stop application, which includes: vehicle license plate number, vehicle identification number, vehicle model-year, vehicle

make. vehicle model. engine manufacturer. engine serial number. and engine model year:

2. Receive and maintain VIN Stop submittal to Department of Motor Vehicles in municipality's or utility's records: and

Obtain and maintain out-of-state buyer's contact information, such as name, address and phone number for the vehicle sold outside of the State of California and acknowledgement of the vehicle's operational status.

~~(K)~~(L) A statement of **compliance**, prepared beginning December 31, 2007, and renewed each December 31, thereafter until December 31, 2012, with low-population counties **continuing** until December 31, 2018, certifying that the municipality's or utility's engines are in compliance as required, including the following:

1. The [insert name of municipality or utility] vehicles at terminal [insert terminal identification number or address] are in compliance with title 13, California Code of Regulations, section 2022.1 "; and
2. The municipality's or utility's name, address, and business telephone; and the signature of the municipality's or utility's agent and the date signed.

- (2) Inspection of Records at the Terminal. Beginning December 31, 2007, the municipality or utility shall provide to any ARB representative any records required to be maintained by the municipality or utility pursuant to subsection (f)(1), by appointment, at the terminal where a vehicle normally resides.
- (3) Records Kept in the Vehicle. For each vehicle, beginning December 31, 2007, the municipality or utility shall keep the following information in the form of a legible and durable label affixed to the driver's side door jamb, or another readily accessible location known to the driver of each vehicle:
 - (A) For each installed diesel emission control strategy, the diesel emission control strategy family name as specified in title 13, California Code of Regulations, section 2706(g)(2), and the installation date; or
 - (B) Engine model-year and planned compliance date, and a statement that the vehicle is following the accelerated turnover option, if applicable; or

- (C) Designation as a low usage vehicle or low-population county low usage vehicle (as applicable) and the vehicle's mileage or hours as of December 31 of each year beginning December 31, 2007; or
 - (D) Engine model-year and terminal where the vehicle is permanently housed if the municipality or utility is located in a low-population county or has been granted low-population county status; or
 - (E) Engine model-year and retirement date for an engine for which a municipality or utility is claiming an extension pursuant to paragraph (d)(4); or
 - (F) Engine ~~model-year~~ and the beginning and the ending dates for the test plan of an engine for which a municipality or utility is claiming an extension pursuant to paragraph ~~(d)(5)~~; or
 - (G) Engine model-year and planned compliance date, and a statement that the vehicle is following the private utility extension, if applicable.
- (4) Each municipality or utility shall maintain these records for each vehicle until it is sold outside of the State of California or is no longer owned or operated by the municipality or utility. If ownership is transferred, the seller shall convey these records to the buyer, or a third-party sales representative.
- (g) Contractor Compliance Requirement. In any contract for services that a municipality or utility enters that has an effective date of December 31, 2007, or later, ~~the~~ municipality or utility shall include language requiring the contractor to be in compliance with all federal, state, and local air pollution control laws and regulations applicable to the contractor.
- (h) Third Party Vehicle Seller Contract Requirement. In any contract with a third party vehicle seller for the sale of a vehicle outside of the State of California to satisfy retirement, a municipality or utility must:
- (1) Include in the contract that it is the third party vehicle seller's responsibility to:
 - (A) Ensure that the vehicle is sold outside of the State of California, or if sold to an intermediate buyer in state, inform the intermediate buyer in writing that the vehicle cannot be sold or operated within California unless the vehicle is in compliance with section 2022.1 (b);
 - (B) Inform the buyer in writing that the vehicle cannot be registered in California unless the vehicle is in compliance with section 2022.1(b); and
 - (C) Notify the buyer in writing to inform future buyers that the vehicle cannot be registered/operated in California unless the vehicle is in compliance with section 2022.1 (b).

- (2) Obtain a written statement from the third party vehicle seller with the buyer's contact information, such as name, address, and phone number; obtain acknowledgment of the requirements in subparagraph 2022.1 (h)(1); and provide original copy to public agency or utility.

~~(h)~~(i) Non-Compliance. Any violations of this section may carry civil penalties as specified in state law and regulations, including, but not limited to, Health and Safety Code Section 39674.

- (1) A municipality or utility that fails to maintain the required records in paragraph (f)(1) may be subject to civil penalties of not less than \$100 per day for every day past the required record-keeping date.
- (2) A municipality or utility that fails to maintain the required records in the vehicle as specified in paragraph (f)(3) may be subject to civil penalties of not less than \$100 per day per vehicle for every day past the required record-keeping date.

NOTE: Authority cited: Sections 39600, 39601, and 39658, Health and Safety Code.
Reference: Sections 39002, 39003, 39655, 39656, 39657, 39658, 39659, 39660, 39661, 39662, 39664, 39665, 39667, 39669, 39674, 39675, 43000, 43013, 43018, 43101, 43102, 43104, 43105 and 43700, Health and Safety Code.

PROPOSED REGULATION ORDER

**REGULATION TO CONTROL EMISSIONS FROM IN-USE ON-ROAD
DIESEL-FUELED HEAVY-DUTY DRAYAGE TRUCKS**

Note: Proposed amendments are shown in underline to indicate additions and strikeout to indicate deletions, compared to the preexisting regulatory language.

Amend section 2027, title 13, California Code of Regulations to read as follows.

Section 2027. **In-Use On-Road Diesel-Fueled Heavy-Duty Drayage Trucks.**

- (a) **Purpose.** The purpose of this regulation is to reduce emissions and public exposure to diesel particulate matter (diesel PM), oxides of nitrogen (NOx), and other air contaminants by setting emission standards for in-use, heavy-duty diesel-fueled vehicles that transport cargo to and from California's ports and intermodal rail facilities.
- (b) **Applicability**
- (1) This regulation applies to owners and operators of on-road diesel-fueled, alternative diesel-fueled and dual-fueled heavy-duty drayage trucks operated at California ports and intermodal rail yard facilities. This regulation also applies to "motor carriers," "marine or port terminals," "intermodal rail yards," and "rail yard and port authorities."
- (2) This regulation does not apply to:
- (A) dedicated use vehicles;
 - (B) vehicles operating under an ARB authorized emergency decree;
 - (C) authorized emergency vehicles;
 - (D) military tactical support vehicles;
 - (E) vehicles that operate at port or intermodal rail yard properties in which the ARB Executive Officer has granted an annual exemption under the provisions of subsection (f) to local port or rail yard authorities; and
 - (F) yard trucks.
- (c) **Definitions.** For purposes of this section, the definitions of Health and Safety Code section 39010 through 39060 apply except to the extent that such.

definitions may be modified by the following definitions that apply specifically to this regulation.

- (1) "Alternative Diesel Fuel" means any fuel used in diesel engines that is not a reformulated diesel fuel as defined in sections 2281 and 2282 of title 13, of the California Code of Regulations, and does not require engine or fuel system modifications for the engine to operate, other than minor modifications (e.g., recalibration of the engine fuel control) that may enhance performance. Examples of alternative diesel fuels include, but **are** not limited to, biodiesel, Fischer-Tropsch fuels, and emulsions of water in diesel fuel. Natural gas is not an alternative diesel fuel. An emission control strategy using a fuel additive will be treated as an alternative diesel fuel based strategy unless:
- (A) the additive is supplied to the engine fuel by an on-board dosing mechanism, or
 - (B) the additive is directly mixed into the base fuel inside the fuel tank of the engine, or
 - (C) the additive and base fuel are not mixed until engine fueling commences, and no more additive plus base fuel combination is mixed than required for a single fueling of a single engine or vehicle.
- (24) "ARB" means the California Air Resources Board.
- (32) "ARB Designees" are defined as those entities that ARB designates or contracts with to perform certain functions or provide specific services on its behalf under this regulation.
- (43) "Authorized Emergency Vehicle" is as defined in Vehicle Code section .165.
- (54) "Average Daily Drayage Truck Visits" is determined by dividing the total number of truck visits within a calendar month by the total number of intermodal rail yard open days for that same calendar month as represented by the following equation:

$$\left(\frac{\text{Total number of truck visits}}{\text{Total number of intermodal rail yard open days}} = \text{Average daily truck count} \right)$$

Where:

- (A) a 'truck visit' is defined as each occurrence of a drayage truck transgressing from outside intermodal rail yard property onto intermodal rail yard property; and,

- (B) an 'open day' is defined as a calendar day in which an intermodal rail yard has drayage truck traffic.
- (65) "Beneficial Cargo Owner" is a cargo owner, the person for whose account the ocean or rail transportation is provided, the person to whom delivery is to be made, a shippers' association, or an ocean or rail transportation intermediary that accepts responsibility for payment of all applicable charges.
- (76) "Bill of Lading" is a document that states the terms of the contract between a shipper and a transportation company. It serves as a document of title of the goods shipped, a contract of carriage, and a receipt for goods.
- (87) "CARB Diesel Fuel" is diesel fuel certified by ARB as meeting the fuel specification standards set forth at title 13, California Code of Regulations (CCR) section 2280 et seq.
- (98) "Class I Railroad" is a freight railway based on large revenues (\$250 million or more) in comparison to the revenues of Class II (which ranges from greater than \$20 million but less than \$250 million) and Class III (less than \$20 million) railways; as defined by the Surface Transportation Board (STB).
- (10) "Compression Ignition Engine" means an internal combustion engine with operating characteristics significantly similar to the theoretical diesel combustion cycle. The regulation of power by controlling fuel supply in lieu of a throttle is indicative of a compression ignition engine.
- (119) "Dedicated Use Vehicles" are uni-body vehicles that do not have separate tractor and trailers and include but are not limited to:
- (A) Dedicated auto transports;
 - (B) Dedicated fuel delivery vehicles;
 - (C) Concrete mixers;
 - (D) On-road mobile cranes
- (1240) "Diesel Fuel" means any fuel that is commonly or commercially known, sold, or represented by the supplier as diesel fuel, including any mixture or primarily liquid hydrocarbons (HC) - organic compounds consisting exclusively of the elements carbon and hydrogen - that is sold or represented by the supplier as suitable for use in an internal combustion, compression - ignition (CI) engine.

(13#) "Diesel-Fueled" means a CI engine fueled by diesel fuel, CARB diesel fuel, or jet fuel, or alternative diesel fuel in whole or part, including liquid natural gas (LNG) engines using diesel fuel for pilot injection are subject to ~~the~~ requirements of this regulation.

(~~1412~~) "Diesel particulate matter (diesel PM)" means the particles found in the exhaust of diesel-fueled compression ignition engines. Diesel PM may agglomerate and adsorb other species to form structures of complex physical and chemical properties. ARB has identified diesel PM as a toxic air contaminant.

(~~1513~~) "Drayage Truck" means any in-use on-road vehicle with a gross vehicle weight rating (GVWR) of 33,000 pounds or greater operating on or transgressing through port or intermodal rail yard property for the purpose of loading, unloading or transporting cargo, such as containerized, bulk or break-bulk goods.

(~~1614~~) "Drayage Truck Owner" means:

(A) the person registered as the owner of a drayage truck as shown by the Department of Motor Vehicles, or its equivalent in another state, province, or country; or the International Registration Plan.

. or

(B) the lessee of the truck, as indicated on the drayage truck's registration pursuant to Vehicle Code section 4453.5.

(~~1715~~) "Drayage Truck Operator" means the driver of the vehicle or any person, party or entity that controls operation of a drayage truck at a port or intermodal rail yard facility.

(~~1816~~) "Drayage Truck Registry (DTR)" is an ARB database that contains information on all trucks that conduct business at California ports and intermodal rail yards.

(~~1917~~) "Drayage Truck Registry Number" is a unique identifier issued to the owner of a drayage truck upon registering in the DTR and corresponds to the truck registered.

(~~2018~~) "DTR Compliant" means that a drayage truck is currently compliant with the requirements of the regulation, including the requirements for the DTR and emission standards.

(~~21~~) "Dual-Fuel Engine" means any compression ignition engine that is engineered and designed to operate on a combination of alternative fuels, such as compressed natural gas (CNG) or liquefied petroleum gas (LPG)

and diesel fuel or an alternative diesel fuel. These engines have two separate fuel systems, which inject both fuels simultaneously into the engine combustion chamber. A dual-fuel engine is not an alternative-fuel engine.

~~(2249)~~ "Emergency Event" means any situation arising from sudden and reasonably unforeseen natural disaster such as earthquake, flood, fire, or other acts of God, or other unforeseen events beyond the control of drayage truck owners and operators that threatens public health and safety or the reasonable flow of goods movement.

~~(2320)~~ "Emergency Decree" means a determination by the Executive Officer that an emergency event has occurred that requires the immediate temporary operation of drayage trucks at ports and intermodal rail yard facilities.

~~(2424)~~ "Executive Officer" is the Executive Officer of ARB or his/her authorized representative.

~~(2522)~~ "Gross Vehicle Weight Rating (GVWR)" is as defined in Vehicle Code Section 350.

~~(2623)~~ "Heavy-Duty" is a manufacturer's gross vehicle weight rating of greater than 33,000 pounds.

~~(2724)~~ "Intermodal Rail Yard" is any rail facility owned or operated by a Class I railroad where cargo is transferred from drayage truck to train or vice-versa that:

(A) is within 80 miles of a port;

or,

(B) is located more than 80 miles from the nearest port and having, on or after January 2008, 100 or more average daily drayage truck visits in anyone calendar month.

Once a rail yard, identified in (B) above, has 100 or more average daily drayage truck visits in anyone month, the rail yard will be considered an intermodal rail yard and will be subject to all provisions of this regulation regardless of the size of future average daily drayage truck visits.

Intermodal rail yards include, but are not limited to, the following facilities: Union Pacific (UP) Oakland, Burlington Northern Santa Fe (BNSF) Hobart, LATC Union Pacific, Commerce UP, Richmond BNSF, Commerce Eastern BNSF, ICTF UP, San Bernardino, Stockton Intermodal BNSF, Lathrop Intermodal UP, and BNSF Oakland.

- (~~2825~~) "International Registration Plan" is a registration reciprocity agreement among states of the United States and provinces of Canada providing for payment of license fees on the basis of total distance operated in all jurisdictions.
- (~~2926~~) "Lessee" has the same meaning as in Vehicle Code section 371.
- (~~3027~~) "Liquid Natural Gas (LNG) Fueled Trucks" are drayage trucks that utilize a heavy-duty pilot ignition engine that is designed to operate using an alternative fuel, except that diesel fuel is used for pilot ignition at an average ratio of no more than one part diesel fuel to ten parts total fuel on any energy equivalent basis. An engine that can operate or idle solely on diesel fuel at any time does not meet this definition.
- (~~3128~~) "Marine or Port Terminals" means wharves, bulkheads, quays, piers, docks and other berthing locations and adjacent storage or adjacent areas and structures associated with the primary movement of cargo or materials from vessel to shore or shore to vessel including structures which are devoted to receiving, handling, holding, consolidating and loading or delivery of waterborne shipments or passengers, including areas devoted to the maintenance of the terminal or equipment. For the purposes of this regulation, the term includes but is not limited to production or manufacturing areas, warehouses, storage facilities, and private or public businesses or entities located on or surrounded by port property.
- (~~3229~~) "Military Tactical Support Vehicles" is as defined in title 13, CCR, section 1905.
- (~~3330~~) "Motor Carrier" is a business intermediary that contracts with beneficial cargo owners, ship companies, port terminals or Class I railroads for pick-up and delivery of goods and with drayage truck owners, who it dispatches to ports and/or intermodal rail yards to pick up and deliver such goods.
- (~~3431~~) "On-road" means a vehicle that is designed to be driven on public highways and roadways and that is registered or is capable of being registered by the California Department of Motor Vehicles (DMV) under Vehicle Code sections 4000 et seq. - or DMV's equivalent in another state, province, or country; or the International Registration Plan. A vehicle covered under ARB's In-Use Off-Road Regulation, title 13, CCR, section 2449 is not an on-road vehicle.
- (~~3532~~) "Oxides of nitrogen (NOx)" means compounds of nitric oxide, nitrogen dioxide, and other oxides of nitrogen. Nitrogen oxides are typically created

during combustion processes and are major contributors to smog formation and acid deposition.

~~(3633)~~ **"Port"** is the port property where marine and port terminals are typically located for the loading and unloading of water-borne commerce onto and from ocean-going vessels. For purposes of this regulation, port does not include port property that is not related to or primarily used to engage in water-borne commerce. Ports covered by this regulation include, but are not limited to, the Port of Long Beach, Port of Los Angeles, Port of Humboldt Bay, Port of San Diego, Port of Hueneme, Port of Oakland, Port of San Francisco, Port of Sacramento, Port of Stockton, Port of Redwood City, Port of Crockett, Port of Richmond, Port of Pittsburg, and the Port of Benicia.

~~(3734)~~ **"Port Authority"** means those entities, either public or private, that are responsible for the operation of the ports.

~~(3835)~~ **"Port Property"** means publicly or privately owned property where a port is located. It is the property that includes the physical boundaries, either contiguous or non-contiguous, of the port and may include other properties owned by the port. For the purposes of this regulation, port property includes privately owned property located within a publicly or privately owned port property's boundaries.

~~(3936)~~ **"Rail Yard Authority"** means those entities, either public or private, that are responsible for the operation of Class I rail yards.

~~(4037)~~ **"Rail Yard Property"** means the property constituting the physical boundaries of intermodal rail yards. For the purposes of this regulation, rail yard property also includes privately owned property located within intermodal rail yard boundaries.

~~(4138)~~ **"Uni-Body Vehicles"** are vehicles that do not have a separate tractor and trailer and include but are not limited to:

- (A) concrete mixers;
- (B) on-road mobile cranes;
- (C) on-road construction equipment.

~~(4239)~~ **"Vehicle"** is as defined in Vehicle Code Section 670.

~~(4340)~~ **"Verified Diesel Emission Control Strategy (VDECS)"** is an emission control strategy that has been verified pursuant to the "Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use

Strategies to Control Emissions from Diesel Engines" in Title 13, California Code of Regulations, commencing with section 2700, and incorporated by reference.

~~(4444)~~ "Yard Truck" means an off-road mobile utility vehicle used to carry cargo containers with or without chassis; also known as a utility tractor rig (UTR), yard tractor, yard goat, yard hustler, or prime mover.

- (d) *Requirements' and Compliance Deadlines.* Drayage trucks subject to this regulation must meet the following requirements by the compliance deadlines detailed in both Phase 1 AND Phase 2.
- (1) *Phase 1:* ~~By~~ December 31, 2009, all drayage trucks must be equipped ~~with:~~
- (A) By December 31, 2009, all drayage trucks must be equipped with:
- ~~1.(A)~~ 1994 - 2003 model year engine certified to California or federal emission standards and a level 3 VDECS for PM emissions;
- or,
- ~~2.(B)~~ 2004 or newer model year engine certified to California or federal emission standards;
- or,
- ~~3.(C)~~ a 1994 or newer model year engine that meets or exceeds 2007 model year California or federal emission standards.
- (B) After December 31, 2011, all drayage trucks with 2004 model year engines must be equipped with the highest level VDECS for PM emissions.
- (C) After December 31, 2012, all drayage trucks with 2005 - 2006 model year engines must be equipped with the highest level VDECS for PM emissions.
- (2) *Phase 2:* After December 31, 2013, all drayage trucks must be equipped with a 1994 or newer model year engine that meets or exceeds 2007 model year California or federal emission standards.
- (3) *Drayage Truck Owner Requirements*
- (A) Drayage truck owners shall:

1. meet all applicable requirements and deadlines set forth in Phases 1 and 2 above;
2. if an aftermarket level 3 VDECS is installed, be able to demonstrate that:
 - a. the VDECS has been verified by ARB for use with the **engine** and vehicle, as described in the Executive Order for the VDECS;
 - b. use of the vehicle must be consistent with the conditions of the Executive Order for the VDECS;
 - c. the VDECS is installed in a verified configuration;
 - d. the engine met the engine manufacturer's operational specifications prior to the VDECS installation;
 - e. the VDECS label is visible;
 - f. the level 3 VDECS is mounted **in** a safe and secure manner on the vehicle consistent with provisions in (3)(A)(2)(c) above, and the fixed position of the level 3 VDECS does not obscure vehicle rear view or side mirror visibility in any way.
 - g. all emission control devices are functioning properly and maintained per manufacturer's specifications;
 - h. in the event of a failure or damage of an aftermarket level 3 VDECS or an OEM equivalent diesel emissions control system while the device is still under warranty, it has taken prompt action to repair or replace the device by the manufacturer or authorized dealer with the same level of VDECS or OEM equivalent diesel emissions control system within 45 days of first noticing or being notified of the failure or damage to the device. .
 - i. it has adhered to the terms and conditions in the aftermarket manufacturer or OEM warranty governing the use of the device.
 - j. if the failure or damage to the level 3 VDECS or OEM equivalent diesel emissions control system occurs after

expiration of the warranty period, it has taken prompt action to personally repair or replace the failed or damaged device with the same level VDECS or OEM equivalent diesel emissions control system available for the engine within 90 days of first noticing or being notified of the failure or damage to the device.

- k. it has not misused, dismantled, or tampered with any components of the level 3 VDECS or OEM equivalent diesel emissions control system, except for purposes of recommended periodical maintenance by an authorized agent, or when it is necessary to detach the device to service the vehicle.
- 3. register with the DTR, according to subsection (e);
 - 4. be able to demonstrate that the drayage truck operator has been informed about the information required under subsection (d)(5)(A)(4) for the dispatching motor carrier and instructed to provide such information to any enforcement personnel listed in subsection (i), upon request.

(B) Phase 1 compliance deadline extension:

- 1. Drayage truck owners may apply for a one-time, one-year, per-truck Phase 1 compliance deadline extension. The compliance deadline application must be either electronically filed or postmarked by June 1, 2009. To receive the Phase 1 compliance deadline extension, a drayage truck owner must demonstrate all of the following:
 - a. the engine installed on his/her current truck is a California or federally certified 1994 - 2003 model year engine;
 - b. the truck was registered with the DTR prior to June 1, 2009;
 - c. no Level 3 diesel emission control technology verified by ARB for use on that combination of truck and engine was available at the time the extension was filed.
- 2. Compliance extension applications shall be submitted to ARB at:

California Air Resources Board
 Drayage Truck Phase1 Extension, SSD
 P.O. Box 2815
 Sacramento, CA, 95812

or electronically through ARB's drayage truck website;
<http://www.arb.ca.gov/drayagetruck>

3. If after the one-year extension ARB verified technology is still unavailable, the truck owner must comply with the regulation within 90 days of the expiration of the extension by replacing the existing heavy duty truck and / or engine with a truck or engine that meets or exceeds the Phase 1 requirements.

(4) *Drayage Truck Operator Requirements*

Drayage truck operators shall, upon request, provide the dispatching motor carrier's contact information as detailed in subsection (d)(5)(A)(4) to authorized enforcement personnel as set forth in subsection (i).

(5) *Motor Carrier Requirements*

(A) Each motor carrier shall:

1. provide a copy of this regulation or an ARB approved summarized version to each drayage truck owner that it contracts with for deliveries to ports and intermodal rail yards;
2. only dispatch drayage trucks to a port or intermodal rail yard that meet emission standards and compliance deadlines set forth in Phases 1 and 2 in subsection (d);
3. only dispatch drayage trucks to ports and intermodal rail yards that are registered and in good standing with the Drayage Truck Registry (DTR) and are DTR compliant;
4. demonstrate that it has only dispatched drayage trucks whose operators have been informed to provide the motor carrier information listed below, upon **request**, to enforcement personnel, as listed in subsection (i).
 - a. the motor carrier's business name;
 - b. contact person's name;
 - c. motor carrier's street address, state, and zip code;
 - d. contact person's business phone number.

5. keep a record of all dispatched drayage trucks containing the information set forth in (a) through (d) below for a minimum of five years from the dispatch date. Dispatch records are to be made available to enforcement personnel within 72 hours of an official written or oral request.
 - a. truck dispatch date and time;
 - b. bill of lading or tracking number;
 - c. truck license plate number and issuing state;
 - d. Drayage Truck Registry number.

(6) *Marine or Port Terminals and Intermodal Rail Yard Requirements*

- (A) Starting September 30, 2009, marine or port terminals and intermodal rail yards shall collect the following information for each drayage truck subject to this regulation that enters the facility that is not DTR compliant as determined by information contained within the Drayage Truck Registry.

1. Dispatching motor carrier:
 - a. business name of dispatching motor carrier;
 - b. contact person's name;
 - c. street address, state, zip code of the dispatching motor carrier;
 - d. phone number of the dispatching motor carrier;
 - e. bill of lading or tracking number.
2. Drayage truck:
 - a. entry date and time;
 - b. registered owner's name;
 - c. operator's name;
 - d. operator's license number;
 - e. drayage truck's license plate number and state of issuance;
 - f. drayage truck's vehicle identification number (VIN).

All information collected in subsection (d)(6) shall be kept for a period of not less than five years from the truck entry date and is to be made available to enforcement personnel within 72 hours of an official written or oral request.

- (B) Marine or port terminals and intermodal rail yards shall report the information collected in subsection (A) above to their respective

authorities according to schedule (A) below and in a format acceptable to their respective authority.

Schedule A: Terminal and Intermodal Rail Yard Reporting Schedule

Date Truck Enters Terminal or Intermodal Rail Yard	Date by which Information is to be Reported to Port or Rail Authority
January 1 – March 31	April 15
April 1 – June 30	July 15
July 1 – September 30	October 15
October 1 – December 31	January 15

(7) *Port Authorities and Rail Yard Authorities Requirements*

- (A) Port and rail yard authorities shall respectively report the information collected by the port terminals and intermodal rail yards, as detailed in subsection (d)(6), to, and in a manner and format prescribed by, ARB according to Schedule B below. ARB reporting parameters are detailed on ARB's website

<http://www.arb.ca.gov/drayagetruck>.

Schedule B: Port and Rail Yard Authority Reporting Schedule

Date by which Information is to be Reported to the California Air Resources Board
May 15
August 15
November 15
February 15

- (B) Port and rail yard authorities shall ensure their respective terminals and/or intermodal rail yards abide by all Schedule A reporting deadlines.
- (C) Rail yard authorities operating rail yards located greater than 80 miles from the nearest port with less than 100 average daily drayage truck visits for each calendar month starting January 2008, must complete and submit quarterly verification reports according to Schedule B and in a format approved by ARB.

The first quarterly verification report shall include average daily drayage truck visits for each calendar month starting with the

effective date of the regulation and submitted to ARB according to schedules A and B above. Subsequent quarterly *verification* reports shall include *average* daily drayage truck *visits* for the three calendar months prior to each reporting date. Quarterly verification reports shall include, but are not limited to, the following information;

- a. reporting rail yard authority contact information;
- b. rail yard name and address; .
- c. *average daily* drayage truck *visits* by calendar month.

Quarterly verification applications and additional guidelines can be obtained by contacting ARB'at:

California Air Resources Board
 Rail Yard Daily Truck Verification, SSD
 P.O. Box 2815
 Sacramento, CA, 95812

or electronically through ARB's drayage truck website;

<http://www.arb.ca.gov/drayagetruck>

(e) *Drayage Truck Registry Requirements*

(1) *Truck Owner Requirements*

- (A) Owners of all drayage trucks doing business at a port or intermodal rail yard prior to September 30, 2009 and intending to continue operations after that date must register with the DTR database by September 30, 2009.
- (B) Drayage trucks intending to begin operations at a port or intermodal rail yard after September 30,2009 must be registered with the DTR database prior to commencing operations.
- (C) Owners of all drayage trucks *covered* by the regulation must provide the follOWing information to ARB or its designee by mail to the address in subsection (e)(2) or electronically through ARB's DTR website <http://www.arb.ca.gov/drayagetruck>. The information shall include but may not be limited to:
 1. truck owner name, address, and contact information (e.g.. phone number, email address, fax number); .
 2. engine make, model, and model year;

3. vehicle identification number (VIN);
4. vehicle license number and state of issuance;
5. compliance status, which shall include:
 - a. identifying whether the drayage truck has complied with the requirements of Phases 1 and 2, set forth in subsection (d) above;
 - b. if so, how was compliance achieved (e.g. new compliant truck or description of the level 3 VDECS that was used), who did the installation work, and when was it completed;
 - c. if not, identifying when the drayage truck is scheduled to come into compliance **under** Phases 1 or 2.

(D) After filing the initial application, the drayage truck owner shall within 30 days of bringing a truck into compliance with Phase 1 or Phase 2, update the DTR with the vehicle's compliance status information and any other changes to the vehicle's ownership, DMV registration status, or participation status in IRP.

- (2) *Mailing Address for Filing Initial Applications and Updates.* Drayage truck owners shall submit DTR applications and any updated information to ARB at:

California Air Resources Board
 c/o Drayage Truck Registry, SSD
 P.O. Box 2815
 Sacramento, CA, 95812

- (3) Failure to register with the DTR or submittal of false information is a violation of state law and subject to **civil** or criminal penalty.

(f) Annual Port or Rail Yard Exemption

- (1) *Annual Exemption.* An annual exemption may be granted, under limited circumstances, by the ARB Executive Officer to ports or rail yards. An exemption may cover a clearly defined portion or the entirety of a port or rail yard. The Executive **Officer** will exempt a port or rail yard that is able to demonstrate one or more of the following:

- (A) port or rail yard land is not typically used for truck traffic and its primary function or location does not include or attract drayage trucks covered under this regulation (e.g. a shoreline animal sanctuary);
 - (B) the overwhelming majority of trucks accessing the port or rail yard are exempted under this regulation (e.g. a port where only dedicated auto transports are in service).
- (2) *The Exemption Request*
- (A) a port or rail yard requesting an exemption shall mail the request to:

California Air Resources Board
Port / Rail Yard Exemption, SSD
P.O. Box 2815
Sacramento, CA, 95812

or may send it electronically to ARBs' website
<http://www.arb.ca.gov/drayagetruck> using the request form available on the site.
 - (B) the request must be completed and submitted annually (via the same website or address listed above) no later than January 1 of the year prior to the exemption year (e.g. a 2010 year exemption application must be completed and submitted by January 1, 2009);
 - (C) the request will be approved or disapproved by the Executive Officer no later than July 1, of the year prior to the exemption year. The Executive Officer will then issue an exemption to be valid for the specified port or rail yard for the specified exemption year.
- (g) *Penalties.* Any person who fails to comply with the performance requirements of this regulation, who fails to submit any information, report, or statement required by this regulation, or who knowingly submits any false statement or representation in any application, report, statement, or other document filed, maintained, or used for the purposes of compliance with this regulation may be subject to civil or criminal penalties under sections 39674, 39675, 42400, 42400.1, 42400.2, 42402, .2, and 43016 of the Health and Safety Code. In assessing penalties, the Executive Officer will consider factors, including but not limited to the willfulness of the violation, the length of time of noncompliance, whether compliance was attempted, and the magnitude of noncompliance.
- (h) *Right of Entry.* For the purpose of inspecting on-road vehicles covered in this regulation, and their records to determine compliance with these regulations, an agent or employee of ARB, upon presentation of proper credentials, has the right

to enter any facility (with any necessary safety clearances) where on-road vehicles are located or on-road vehicle records are kept.

- (i) *Enforcement.* Enforcement of this section may be carried out by authorized representatives of ARB, port and rail yard authorities; peace officers as defined in California Penal Code, Title 3, chapter 4.5, sections 830 etseq. and their respective law enforcement agencies; and authorized representatives of air pollution control or air quality management districts.
- (j) *Relationship to Other Law.* Nothing in this section allows drayage trucks to operate in violation of other applicable law, including, but not limited to:
 - (1) California Vehicle Code;
 - (2) California Health and Safety Code;
 - (3) division 3, title 13, California Code of Regulations;
 - (4) any applicable ordinance, rule, or requirement as stringent as, or more stringent than, than the requirements of subsection (d) of this regulation.
- (k) *Severability.* If any subsection, paragraph, subparagraph, sentence, clause, phrase, or portion of this regulation is, for any reason, held invalid, unconstitutional, or unenforceable by any court of competent jurisdiction, such portion shall be deemed as a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions of the regulation.

Note: Authority Cited: Sections 39600, 39601, 39650, 39658, 39659, 39666, 39667, 39674, 39675, 42400, 42400.1, 42400.2, 42402.2., 42410, 43013, 43016, 43018, 43023, 43600, California Health and Safety Code. Reference: Sections 39650, 39658, 39659, 39666, 39667, 39674, 39675, 42400, 42400.1, 42400.2, 42402.2, 42410, 40717.9, 43013, 43016, and 43018, 43023, 43600, California Health and Safety Code.

PROPOSED REGULATION ORDER
IN-USE OFF-ROAD DIESEL-FUELED FLEETS

Note: Proposed amendments are shown in underline to indicate additions and strikeout to indicate deletions, compared to the preexisting regulatory language. The symbol "*****", indicates that regulatory text not being amended is not shown.

Amend section 2449, title 13, California Code Of Regulations to read as follows.

§ 2449. General Requirements for In-Use Off-Road Diesel-Fueled Fleets.

(a) Purpose

(b) Applicability

Except as provided in the paragraphs below, the regulation applies to any person, business, or government agency who owns or operates within California' any diesel-fueled or alternative diesel fueled off-road compression ignition vehicle engine with maximum power of 25 horsepower (hp) or greater that is used in a two-engine crane or to provide motive power in a workover rig or to provide motive power in any other motor vehicle that (1) cannot be registered and driven safely on-road or was not designed to be driven on-road, and (2) is not an implement of husbandry or recreational off-highway vehicle. Unless they are workover rigs or two-engine cranes. ~~Vehicles~~ that were designed to be driven on-road, have on-road engines, and still meet the original manufacturer's on-road engine emission certification standard are considered on-road and are specifically excluded from this regulation, even if they have been modified so that they cannot be registered and driven safely on-road. Off-road vehicles that were designed for off-road use and have off-road engines are considered off-road and are subject to this regulation, even if they have been modified so that they can be driven safely on-road.

(c) Definitions

(56) "Two-Engine Crane" means a mobile diesel-powered machine with a hoisting mechanism mounted on a specially constructed truck chassis or carrier; one engine provides motive power. and a secondary engine is used to lift and move materials and objects.

~~(56)~~ ***uVerified Diesel Emission Control Strategy***" (***VDECS***) means an emissions control strategy, designed primarily for the reduction of diesel PM emissions, which has been verified pursuant to the *Verification Procedures*. VDECS can be verified to achieve Level 1 diesel PM reductions (25 percent), Level 2 diesel PM reductions (50 percent), or Level 3 diesel PM reductions (85 percent). VDECS

may also be verified to achieve NO_x reductions. See also definition of Highest Level VDECS.

(578) *"VDECS Failure"* means the condition of not achieving the emissions reductions to which the VDECS is verified. Such condition **could** be due to inappropriate installation, damage, or deterioration during use. If a Level 3 VDECS is emitting visible smoke, it should be assumed to have failed.

(589) *"Workover rig"* means a mobile self-propelled rig used to perform one or more remedial operations, such as deepening, plugging back, pulling and resetting liners, on a producing oil or gas well to try to restore or increase the well's production.

(d) Performance Requirements -

(e) Special Provisions/Compliance Extensions

(7) Exemption for Low-Use Vehicles - Low-use vehicles are exempt from the performance requirements in sections 2449(d)(4) through 2449(d)(6) and 2449(d)(8) through 2449(d)(10), 2449.1 (a), 2449.2(a) and 2449.3(d), but still must meet the idling limits in section 2449(d)(3) and adding vehicles requirements in section 2449(d)(7) and be labeled and reported in accordance with sections **2449(f)** and (g). Low-use vehicles need not be included when calculating fleet average indices or target rates, when determining fleet size, or when calculating the required horsepower for the BACT turnover and retrofit requirements in sections 2449.1 (a)(2)-and-2449.2(a)(2).

Vehicles that formerly met the low-use vehicle definition, but whose use increases to 100 hours per year or greater must meet the adding vehicles requirements in section.2449(d)(7) and meet the BACT requirements or be included in the fleet average calculation by the next compliance date. For example, a formerly low-use engine that exceeds 100 hours per year between March 1, 2013 and February 28, 2014 must be included in the fleet average indices and target rates reported in 2014.

(14) Two-Engine Cranes - Both engines in a two-engine crane are subject to this regulation. For purposes of the rounding provisions in section 2449.1 (a)(2)(a)7., neither engine in the two-engine crane is required to be turned over until the horsepower required to be turned over under section 2449.1 (a)(2)(A) is at least

half the sum of the maximum power of the primary and secondary engine in the two-engine crane.

- (15) On-road Registered Vehicles with Off-road Engines - If a workover rig or other on-road registered vehicle subject to this regulation with an off-road engine is repowered and will be registered and driven on-road, it must be repowered with an on-road certified engine of the same model year or newer as the engine being replaced.

(f) Labeling

(g) Reporting-

Reporting is required for each and every fleet. Large and medium fleets may report separately for different divisions or subsidiaries of a **given** company or agency. Fleet owners may submit reporting information using forms (paper or electronic) approved by the Executive Officer.

(1) Initial Reporting -

(A) Fleet Owner -

(B) Vehicle List - A list of each vehicle subject to this regulation along with the following information for each vehicle:

1. Vehicle type;
2. Vehicle manufacturer;
3. Vehicle model;
4. Vehicle model year;
5. Vehicle serial number (Le.! for workover rigs and two-engine cranes, vehicle identification number);
6. Whether the vehicle is a low-use vehicle;
7. If the vehicle is a low-use vehicle, whether the vehicle was operated outside of California during the previous compliance year;
8. Whether the vehicle is a specialty vehicle;
9. Whether the vehicle is a vehicle used solely for emergency operations;
10. Whether the vehicle is a dedicated snow removal vehicle;
11. Whether the vehicle is used for agricultural operations for over half of its annual operating hours;
12. Whether the vehicle is an electric vehicle that replaced a diesel vehicle;

13. Whether the vehicle has been retrofit, repowered, or replaced with Surplus Off-road Opt-in for NOx program funding and, if so, the start and end dates of the contract period;
14. Whether the vehicle has been retrofit, repowered, or replaced with Carl Moyer program funding;
15. Whether the vehicle has been retrofit through a demonstration program, and - if so - which program;
16. EIN if it has already been assigned;
17. License plate number, if vehicle has a license plate.

Note: Authority cited: Sections 39002,39515,39516,39600,39601,39602, 39650,39656,39658,39659,39665,39667,39674,39675,40000, 41511,42400,42400.1,42400.2,42400.3.5,42402, 42402.1, 42402.2, 42402.4,42403,43000,43000.5,43013,43016 and 43018, Health and Safety Code. Reference: Sections 39002,39515,39516,39600,39601, 39602,39650,39656,39657,39658,39659,39665,39667,39674, 39675,40000,41511,42400,42400.1,.42400.2, 42402.2, 43000, 43000.5,43013,43016 and 43018, Health and Safety Code.

§ 2449.3. Surplus Off-Road Opt-In for **NOx** (SOON) Program

(a) *Purpose*

(b) *Applicability*

(1) *District Applicability-*

(2) *Fleet Applicability-* Section 2449.3 applies to a fleet that:

- (A) Operates individual vehicles within the air district;
- (B) As of January 1,2008, on a statewide level, consisted of more than 40 percent Tier 0 and Tier 1 vehicles, and;
- (C) Has a statewide fleet with maximum power greater than 20,000 horsepower (hp), excluding the hp from engines in two-engine cranes and the hp from single engine cranes formerly subject to the Cargo Handling Equipment Regulation.

Note: Authority cited: Sections 39002, 39515, 39516, 39600, 39601, 39602, 43000, 43000.5, 43013, 43016 and 43018, Health and Safety Code. Reference: Sections 39002, 39515, 39516, 39600, 39601, 39602, 39650, 39656, 39657, 39658, 39659, .. /39665, 39667, 43000, 43000.5, 43013, 43016 and 43018, Health and Safety Code.

Proposed Regulation Order

REGULATION FOR MOBILE CARGO HANDLING EQUIPMENT
AT PORTS AND INTERMODAL RAIL YARDS

Note: Proposed amendments are shown in underline to indicate additions and strikeout to indicate deletions, compared to the preexisting regulatory language. The symbol "*****", indicates that regulatory text not being amended is not shown.

Amend section 2479, title 13, California Code of Regulations to read as follows.

§ 2479. Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards.

(a) Purpose

(b) Applicability

(c) Exemptions

- (1) The requirements of this section do not apply to mobile cargo handling equipment that do not operate at a port or intermodal rail yard;
 - (2) The requirements of this section do not apply to portable CI engines;
 - (3) The requirements of subsections (e), (f), (g), (h), and (i) do not apply to mobile cargo handling equipment that are not used to handle cargo at any time but are used for transporting personnel or fuel delivery. Examples include, but are not limited to, fuel delivery trucks operating solely at the terminal to deliver fuel to terminal equipment and vans and buses used to transport personnel; ~~and~~
 - (4) The requirements of this section do not apply to military tactical support cargo handling equipment; ~~;~~
 - (5) The requirements of this section do not apply to mobile cranes as defined in subsection (d)(33); and
 - (6) The requirements of this section do not apply to sweepers as defined in subsection (d)(54).
- (d) Definitions

For purposes of this section, the definitions of Health and Safety Code section 39010 through 39060 shall apply except to extent that such definitions may be modified by the following definitions that apply specifically to this regulation:

- (1) "Alternative Diesel Fuel" means any fuel used in a CI engine that is not commonly or commercially known, sold, or represented by the supplier as diesel fuel No. 1-0 or No. 2-D, pursuant to the specifications in ASTM 0975-81, "Standard Specification for Diesel Fuel Oils," as modified in May 1982, which is incorporated herein by reference, or an alternative fuel, and does not require engine or fuel system modifications for the engine to operate, although minor modifications (e.g., recalibration of the engine fuel control) may enhance performance. Examples of alternative diesel fuels include, but are not limited to, biodiesel that does not meet the definition of CARB diesel fuel; Fischer-Tropsch fuels; emulsions of water in diesel fuel; and fuels with a fuel additive, unless:
 - (A) the additive is supplied to the engine fuel by an on-board dosing mechanism, or
 - (B) the additive is directly mixed into the base fuel inside the fuel tank of the engine, or
 - (C) the additive and base fuel are not mixed until engine fueling commences, and no more additive plus base fuel combination is mixed than required for a single fueling of a single engine.
- (2) "Alternative Fuel" means natural gas, propane, ethanol, methanol, gasoline (when used in hybrid electric mobile cargo handling equipment only), hydrogen, electricity, fuel cells, or advanced technologies that do not rely on diesel fuel. "Alternative fuel" also means any of these fuels used in combination with each other or in combination with other non-diesel fuel.
- (3) "Basic Container Handling Equipment" means mobile cargo handling equipment, other than yard trucks, bulk cargo handling equipment, and RTG cranes, used to handle cargo containers. Basic Container Handling Equipment includes but is not limited to top handlers, side handlers, reach stackers, straddle carriers, and forklifts.
- (4) "Bulk Cargo Handling Equipment" means mobile cargo handling equipment, other than yard trucks, basic container handling equipment, and RTG cranes, generally used to move non-containerized cargo, including but not limited to dozers, excavators, loaders, tractors, mobile cranes (excluding rubber tired gantry cranes), and aerial lifts, and sweepers.
- (5) "California Air Resources Board (CARB) Diesel Fuel" means any diesel fuel that meets the specifications of vehicular diesel fuel, as defined in title 13 CCR, sections 2281, 2282, and 2284.

- (6) "Carbon Monoxide (CO)" is a colorless, odorless gas resulting from the incomplete combustion of hydrocarbon fuels.
- (7) "Cargo Handling Equipment" means any off-road, self-propelled vehicle or equipment used at a port or intermodal rail yard to lift or move container, bulk, or liquid cargo carried by ship, train, or another vehicle, or used to perform maintenance and repair activities that are routinely scheduled or that are due to predictable process upsets. Equipment includes, but is not limited to, mobile - cranes, rubber-tired gantry cranes, yard trucks, top handlers, side handlers, reach stackers, forklifts, loaders, ~~sweepers~~, aerial lifts, excavators, and dozers.
- (8) "Certified Off-road Diesel Engine" means an engine certified to California off-road engine emission standards under title 13 CCR, section 2423.
- (9) "Certified On-road Diesel Engine" means an engine certified to California on-road diesel engine emission standards under title 13 CCR, section 1956.8.
- (10) "Compression Ignition (CI) Engine" means an internal combustion engine with operating characteristics significantly similar to the theoretical diesel combustion cycle. The regulation of power by controlling fuel supply in lieu of a throttle is **indicative of a compression** ignition engine.
- (11) "Contiguous Properties" means two or more parcels of land with a common boundary or separated solely by a public roadway or other public right-of-way.
- (12) "Diesel Fuel" means any fuel that is commonly or commercially known, sold, or represented by the supplier as diesel-fuel, including any mixture of primarily liquid hydrocarbons (HC) - organic compounds consisting exclusively of the elements carbon and hydrogen - that is sold or represented by the supplier as suitable for use in an internal combustion, compression-ignition engine.
- (13) "Diesel-Fueled" means a CI engine fueled by diesel fuel, CARB diesel fuel, or jet fuel, in whole or part.
- (14) "Diesel Oxidation Catalyst (DOC)" means a catalyst promoting oxidation processes in diesel exhaust, and usually designed to reduce emissions of the organic fraction of diesel particulates, gas-phase HC, and CO.
- (15) "Diesel Particulate Filter (DPF)" means an emission control technology that reduces PM emissions by trapping the particles in a flow filter substrate and periodically removes the collected particles by either physical action or by oxidizing (burning off) the particles in a process called regeneration.
- (16) "Diesel Particulate Matter (Diesel PM)" means the particles found in the exhaust of diesel-fueled CI engines. Diesel PM may agglomerate and adsorb other species to form structures of complex physical, and **chemical** properties.

- (17) "Dozer" means an off-road tractor, either tracked or wheeled, equipped with a blade.
- (18) "Emission Control Strategy" means any device, system, or strategy employed with a diesel engine that is intended to reduce emissions, including, but not limited to, diesel oxidation catalysts, selective catalytic reduction systems, fuel additives, diesel particulate filters, alternative diesel fuels, water emulsified fuels, and any combination of the above.
- (19) "Excavator" means an off-road vehicle consisting of a backhoe and cab mounted on a pivot atop an undercarriage with tracks or wheels.
- (20) "Executive Officer" means the Executive Officer of the California Air Resources Board or his/her designee.
- (21) "Fleet" means the total number of mobile cargo handling equipment vehicles owned, rented, or leased by an owner or operator at a specific terminal or intermodal yard location.
- (22) "Forklift" means an off-road industrial truck used to hoist and transport materials by means of steel fork(s) under the load.
- (23) "Fuel Additive" means any substance designed to be added to fuel or fuel systems or other **engine-related** engine systems such that it is present in-cylinder during combustion and has any of the following effects: decreased emissions, improved fuel economy, increased performance of the engine; or assists diesel emission control strategies in decreasing emissions, or improving fuel economy or increasing performance of the engine.
- (24) "Heavy-duty Pilot Ignition Engine" means an engine designed to operate using an alternative fuel, except that diesel fuel is used for pilot ignition at an average ratio of no more than one part diesel fuel to ten parts total fuel on any energy equivalent basis. An engine that can operate or idle solely on diesel fuel at any time does not meet this definition.
- (25) "Hydrocarbon (HC)" means the sum of all hydrocarbon air pollutants.
- (26) "In-Use" means a CI engine that is not a "new" CI engine.
- (27) "Intermodal Rail Yard" means any transportation facility primarily dedicated to the business of rail and/or intermodal rail operations where cargo is transferred to or from a train and any other form of conveyance, such as train to ship, ship to train, train to truck, or truck to train.

- (28) "Lease" means a contract by which one conveys cargo handling equipment for a specified term and for a specified rent.
- (29) "Level" means one of three categories of Air Resources Board-verified diesel emission control strategies as set forth in title 13, CCR, section 2701 et seq: Level 1 means the strategy reduces engine diesel particulate matter emissions by between 25 and 49 percent, Level 2 means the strategy reduces engine diesel particulate matter emissions by between 50 and 84 percent, and Level 3 means the strategy reduces engine diesel particulate matter emissions by 85 percent or greater, or reduces engine emissions to less than or equal to 0.01 grams diesel PM per brake horsepower-hour.
- (30) "Loader" means any type of off-road tractor with either tracks or rubber tires that uses a bucket on the end of movable arms to lift and move material; can be also referred to as a front-end loader, front loader, skid steer loader, backhoe, rubber-tired loader, or wheeled loader.
- (31) "Military Tactical" Support Cargo Handling Equipment" means cargo handling equipment that meets military specifications, owned by the U.S. Department of Defense and/or the U.S. military services, and used in combat, combat support, combat service support, tactical or relief operations, or training for such operations.
- (32) "Minimum Use Requirement" means an agreement, as part of state or local incentive funding programs or written agreement between mobile cargo handling equipment owners or operators and the Ports of Long Beach, Los Angeles, or Oakland, to use an emission control device on mobile cargo handling equipment for a specified minimum number of years and/or hours.
- (33) "Mobile Crane" means the propulsion engine of a ~~mobile machine, crane~~ other than a rubber-tired gantry crane, with a hoisting mechanism mounted on a specially constructed truck chassis or carrier; a mobile crane can either be a single-engine crane or a two-engine crane.
- (34) "Model Year" means the CI engine manufacturer's annual production period, which includes January 1st of a calendar year, or if the manufacturer has no annual production period, the calendar year.
- (35) "Newly Purchased, -Leased, or Rented Cargo Handling Equipment" means mobile cargo handling equipment, or a diesel-fueled CI engine installed in mobile cargo handling equipment, that is newly purchased, rented, or leased by an owner or operator on or after January 1, 2007, and is operated at a port or intermodal rail yard in the state of California after January 1, 2007.
- (36) "Nitrogen Oxides (NOx)" means compounds of nitric oxide (NO), nitrogen dioxide (NO₂), and other oxides of nitrogen, which are typically created during

combustion processes and are major contributors to smog formation and acid deposition.

- (37) "Non-Methane Hydrocarbons (NMHC)" means the sum of all HCair pollutants except methane.
- (38) "Non-Yard Truck Mobile Cargo Handling Equipment" means all mobile cargo handling equipment other than yard trucks.
- (39) "Ocean-going Vessel" means a commercial, government, or military vessel meeting anyone of the following criteria:
 - (A) a vessel with a "registry" (foreign trade) endorsement on its United States Coast Guard certificate of documentation, or a vessel that is registered under the flag of a country other than the United States;
 - (8) a vessel greater than or equal to 400 feet in length overall (LOA) as defined in 50 CFR § 679.2, as adopted June 19, 1996;
 - (C) a vessel greater than or equal to 10,000 gross tons (GT ITC) per the convention measurement (international system) as defined in 46 CFR 69.51-.61, as adopted September 12, 1989; or
 - (D) a vessel propelled by a marine compression ignition engine with a per-cylinder displacement of greater than or equal to 30 liters.
- (40) "Off-Road Engine" means an engine used in an off-road vehicle, or piece of equipment, including a certified on-road diesel engine.
- (41) "Off-Road Vehicle or Equipment" means any non-stationary device, including registered motor vehicles, powered by an internal combustion engine or motor, used primarily off the highways to propel, move, or transport persons or property.
- (42) "Owner or Operator" means any person subject to the requirements of this section, including but not limited to:
 - (A) an individual, trust, firm, joint stock company, business concern, partnership, limited liability company, association, or corporation including but not limited to, a government corporation; and
 - (8) any city, county, district, commission, the state or any department, agency, or political subdivision thereof, any interstate body, and the federal government or any department or agency thereof to the extent permitted by law.
- (43) "Particulate Matter (PM)" means the particles found in the exhaust of CI engines, which may agglomerate and adsorb other species to form structures of complex physical and chemical properties.

- (44) "Port" means a place, which typically consists of different terminals, where cargo is loaded onto and unloaded from ocean-going vessels primarily. A port includes military terminals that operate cargo handling equipment when located as part of, or on contiguous properties with, non-military terminals.
- (45) "Portable CI Engine" means a compression ignition (CI) engine designed and capable of being carried or moved from one location to another. Indicators of portability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform. Portable engines are not self-propelled.
- (46) "Purchased" means the **date** shown on the front of the cashed check, the date of the financial transaction, or the date on the engine purchasing agreement, whichever is earliest.
- (47) "Railcar Mover" means an off-road vehicle fitted with rail couplers and capable of traveling on both roads and rail tracks.
- (48) "Reach Stacker" means an off-road truck-like cargo contain'er handler that uses an overhead telescopic boom that can reach across two or more stacks of cargo containers and lift the containers from the top.
- (49) "Registered Motor Vehicle" means a yard truck or other cargo handling vehicle that is registered as a motor vehicle under Vehicle Code section 4000, et seq.
- (50) "Rent" means payment for the use of mobile cargo handling equipment for a specified term.
- (51) "Retirement" or "Retire" means an engine ~~or~~ vehicle that will be taken out of service by an owner or operator and will not be operated at a port or intermodal rail yard in the State of California. The engine may be sold outside of California or scrapped.
- (52) "Rubber-tired Gantry Crane or RTG Crane" means an off-road overhead cargo container crane with the lifting mechanism mounted on a cross-beam supported on vertical legs which run on rubber tires.
- (53) "Side Handler or Side Pick" means an off-road truck-like cargo container handler that uses an overhead telescopic boom to lift empty or loaded cargo containers by grabbing either two top corners on the longest side of a container, both arms of one side of a container, or both top and bottom sides of a container.
- (54) "Sweeper" means an off road vehicle with attached brushes underneath that sweep the ground and pick up dirt and debris.

- (55) "Terminal" means a facility, including one owned or operated by the Department of Defense or the U.S. military services, that operates cargo handling equipment at a port or intermodal rail yard.
- (56) "Tier 4 Off-road Emission Standards" means the emission standards promulgated by the United States Environmental Protection Agency in "Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel; Final Rule" (Vol. 69, No. 124 Fed. Reg. pp. 38957-39273, June 29, 2004) which harmonize with the final amended emission standards for newly manufactured off-road engines approved by the Air Resources Board on December 12, 2004.
- (57) "Top Handler or Top Pick" means an off-road truck-like cargo container handler that uses an overhead telescopic boom to lift empty or loaded cargo containers by grabbing the top of the containers.
- (58) "Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines (Verification Procedure)" means the Air Resources Board (ARB) regulatory procedure codified in title 13, CeR, sections 2700-2710, which is incorporated herein by reference, that engine manufacturers, sellers, owners, or operators may use to verify the reductions of diesel PM and/or NOx from in-use diesel engines using a particular emission control strategy.
- (59) "Verified Diesel Emission Control Strategy (VDECS)" means an emission control strategy, designed primarily for the reduction of diesel PM emissions, which has been verified pursuant to the "Verification Procedure for In-Use Strategies to Control Emissions from Diesel Engines" in title 13, California Code of Regulations, commencing with section 2700.
- (60) "Yard truck" means an off-road mobile utility vehicle used to carry cargo containers with or without chassis; also known as utility tractor rig (UTR), yard tractor, yard goat, yard hostler, yard hustler, or prime mover.

(g) Diesel Emission Control Strategy Special Circumstances

(h) Alternative Compliance Plan for Non-Yard Truck Cargo Handling Equipment

✓

Proposed Amendments to the
REGULATION TO ESTABLISH A STATEWIDE PORTABLE EQUIPMENT
REGISTRATION PROGRAM

Note: Proposed amendments are shown in underline to indicate additions and strikeout to indicate deletions, compared to the preexisting regulatory language.

Amend section 2450, title 13, California Code of Regulations.

§ 2450. Purpose.

These regulations establish a statewide program for the registration and regulation of portable engines and engine-associated equipment (portable engines and equipment units) as defined herein. Portable engines and equipment units registered under the Air Resources Board program may operate throughout the State of California without authorization (except as specified herein) or permits from air quality management or air pollution control districts (districts). These regulations preempt districts from permitting, registering, or regulating portable engines and equipment units, including equipment necessary for the operation of a portable engine (e.g. fuel tanks), registered with the Executive Officer of the Air Resources Board except in the circumstances specified in the regulations.

NOTE: Authority cited: Section 39600, 39601, 41752, 41753, 41754, 41755, 43013(b), and 43018, Health and Safety Code. Reference: Sections 41750, 41751, 41752, 41753, 41754, and 41755, Health and Safety Code.

§ 2451. Applicability.

- (a) Registration under this regulation is voluntary for owners of portable engines or equipment units.
- (b) This regulation applies to portable engines and equipment units as defined in section 2452. Except as provided in paragraph (c) of this section, any portable engine or equipment unit may register under this regulation. Examples include, but are not limited to:
 - (1) portable equipment units driven solely by portable engines including confined and unconfined abrasive blasting, Portland concrete batch plants, sand and gravel screening, rock crushing, and unheated pavement recycling and crushing operations;
 - (2) consistent with section 209 (e) of the federal Clean Air Act, engines and associated equipment used in conjunction with the following types of portable operations: well drilling, service or work-over rigs; power generation, excluding cogeneration; pumps; compressors; diesel pile-driving hammers; welding; cranes; woodchippers;

dredges; equipment necessary for the operation of portable engines and equipment units; and military tactical support equipment.

- (c) The following are not eligible for registration under this program:
- (1) any engine used to propel mobile equipment or a motor vehicle of any kind as defined in section 2452 (~~z~~aa)(1)(A);
 - (2) any engine or equipment unit not meeting the definition of portable as defined in section 2452 (~~e~~cd) of this regulation;
 - (3) engines, equipment units, and associated engines determined by the Executive Officer to qualify as part of a stationary source permitted by a district;
 - (4) any engine or equipment unit subject to an applicable federal Maximum Achievable Control Technology standard, or National Emissions Standard for Hazardous Air Pollutants, or federal New Source Performance Standard, except for equipment units SUbject to 40 CFR Part 60 Subpart 000 (Standards of Performance for Nonmetallic Mineral Processing Plants);
 - (5) any engine or equipment unit operating within the boundaries of the California Outer Continental Shelf (OCS). [Note: This shall not prevent statewide registration of portable engines and equipment units already permitted by a district for operation in the OCS. Such statewide registration shall only be valid for operation onshore and in State Territorial Waters (STW).];
 - (6) any dredging operation in the Santa Barbara Harbor;
 - (7) any dredging unit owned by a single port authority, harbor district, or similar agency in control of a harbor, and operated only within the same harbor;
 - (8) generators used for power production into the grid, except to maintain grid stability during an emergency event or other unforeseen event that affects grid stability; and
 - (9) generators used to provide primary or supplemental power to a bUilding, facility, stationary source, or stationary equipment, except during unforeseen interruptions of electrical power from the serving utility, maintenance and repair operations, electrical upgrade operations including startup, shutdown, and testing that do not exceed 60 calendar days, operations where the voltage, frequency, or electrical current requirements can only be supplied by a portable generator, or remote operations where grid power is unavailable.
- (d) In the event that the owner of an engine or equipment unit elects not to register under this program, the engine or equipment unit shall be subject to district permitting requirements pursuant to district regulations.

NOTE: Authority cited: Sections 39600,39601,41752,41753,41754,41755, 43013(b) and 43018, Health and Safety Code. Reference: Sections 41750, 41751, 41752, 41753, 41754, and 41755, Health and Safety Code.

§ 2452. Definitions.

- (a) "Air Contaminant" shall have the same meaning as set out in section 39013 of the Health and Safety Code.
- (b) "ARB" means the California Air Resources Board.
- (c) "Certified Compression-Ignition Engine" means an engine meeting the nonroad engine emission standards for compression-ignition engines, as set forth in title 13 of the California Code of Regulations (CCR) or 40 CFR Part 89 in effect at the time of application.
- (d) "Certified Spark-Ignition Engine" means an engine meeting the nonroad engine emission standards for spark-ignition engines, as set forth in title 13, CCR or 40 CFR Part 1048 in effect at the time of application.
- (e) "Compression-Ignition (CI) Engine" means an internal combustion engine with operating characteristics significantly similar to the theoretical diesel combustion cycle. Compression-ignition engines usually control fuel supply instead of using a throttle to regulate power.
- (f) "Corresponding Onshore District" means the district which has jurisdiction for the onshore area that is geographically closest to the engine or equipment unit.
- (g) "Crane" means the same as "Two-Engine Crane" defined in title 13, CCR, section 2449(c)(56).
- (gh) "District" means an air pollution control district or air quality management district created or continued in existence pursuant to provisions of Part 3 (commencing with section 40000) of the California Health and Safety Code.
- (hi) "Electrical Upgrade" means replacement or addition of electrical equipment and systems resulting in increased generation, transmission and/or distribution capacity.
- (ij) "Emergency Event" means any situation arising from sudden and reasonably unforeseen natural disaster such as earthquake, flood, fire, or other acts of God, or other unforeseen events beyond the control of the portable engine or equipment unit operator, its officers, employees, and contractors that threatens public health and safety and that requires the immediate temporary operation of portable engines or equipment units to help alleviate the threat to public health and safety.
- (jk) "Engine" means any piston driven internal combustion engine.
- (kl) "Equipment Unit" means equipment that emits PM10 over and above that emitted from an associated engine.

- (~~lm~~) "Executive Officer" means the Executive Officer of the California Air Resources Board or his/her designee.
- (~~ffin~~) "Hazardous Air Pollutant (HAP)" means any air contaminant that is listed pursuant to section 112(b) of the federal Clean Air Act.
- (~~hQ~~) "Home District" means the district designated by the responsible official ~~as~~ the district in which the registered engine or equipment unit resides most of the time. For registered engines or equipment units based out of California, the responsible official shall designate the home **district based** on where the registered engine or equipment unit is likely to ~~be~~ operated a majority of the time the registered engine or equipment unit is in California.
- (~~ep~~) "Identical Replacement" means a substitution due to mechanical breakdown of a registered portable engine or equipment unit with another portable engine or equipment unit that has the same manufacturer, type, model number, manufacturer's maximum rated capacity, and rated brake horsepower; and is intended to perform the same or similar **function** as the original portable engine or equipment unit; and has equal or lower emissions expressed as mass per unit time; and meets the emission requirements of sections 2455 through 2457 of this article.
- (~~pg~~) "In-field Inspection" means an inspection that is conducted at the location that the portable engine or equipment unit is operated under normal load and conditions.
- (~~qr~~) "Location" means **any** single site at a ~~b~~Uilding, structure, facility, or installation.
- (~~rs~~) "Maximum Achievable Control Technology (MACT)" means any federal requirement promulgated as part of 40 CFR Parts 61 and 63.
- (~~st~~) "Maximum Rated Capacity" is the maximum throughput rating or volume capacity listed on the nameplate of the registered equipment unit as specified by the manufacturer.
- (~~tu~~) "Maximum Rated Horsepower (brake horsepower (bhp))" is the maximum brake horsepower rating specified **by** the registered engine manufacturer and listed on the nameplate of the registered engine.
- (~~uv~~) "Mechanical Breakdown" means any failure of an engine's electrical system or mechanical parts that necessitates the removal of the registered engine from service.
- (~~wy~~) "Modification" means any physical change to, change in method of operation of, or an addition to a registered engine or equipment unit, which may cause or result in an increase in the amount of any air contaminant emitted or the issuance of air contaminants not previously emitted. Routine maintenance

and/or repair shall not be considered a physical change. Unless previously limited by an enforceable registration condition, a change in the method of operation shall not include:

- (1) an increase in the production rate, unless such increase will cause the maximum design capacity of the registered equipment unit to be exceeded;
- (2) an increase in the hours of operation;
- (3) a change of ownership; and
- (4) the movement of a registered engine or equipment unit from one location to another.

(wx) "New Nonroad Engine" means a nonroad engine, the equitable or legal title to which has never been transferred to an ultimate purchaser. If the equitable or legal title to an engine is not transferred to an ultimate purchaser until after the engine is placed into service, then the engine will no longer be new after it is placed into service. A nonroad engine is placed into service when it is used for its functional purposes. The term "ultimate purchaser" means, with respect to a new nonroad engine, the first person who purchases a new nonroad engine for purposes other than resale.

(xy) "New Source Performance Standard (NSPS)" means any federal requirement promulgated as part of 40 CFR Part 60.

(yz) "Non-field Inspection" means an inspection that is either conducted at a location that is mutually acceptable to the district and the owner or operator or where the engine or equipment unit is stored and does not require operation of the engine or equipment unit for purposes of the inspection.

(zaa) "Nonroad Engine" means:

- (1) Except as discussed in paragraph (2) of this definition, a nonroad engine is any engine:
 - (A) in or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as garden tractors, off-highway mobile cranes and bulldozers); or
 - (B) in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers); or
 - (C) that, by itself or in or on a piece of equipment, is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.
- (2) An engine is not a nonroad engine if:

- (A) the engine is used to propel a motor vehicle or a vehicle used solely for competition, or is subject to standards promulgated under section 202 of the federal Clean Air Act; or
- (B) the engine is regulated by a federal New Source Performance Standard promulgated under section 111 of the federal Clean Air Act; or
- (C) the engine otherwise included in paragraph (1)(C) of this definition remains or will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. Any engine (or engines) that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period. An engine located at a seasonal source is an engine that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (at least two years) and that operates at that single location approximately three (or more) months each year.

~~(aabb)~~ "**Outer** Continental Shelf (OCS)" shall have the meaning provided by section 2 of the Outer Continental Shelf Lands Act (43 U.S.C. Section 1331 et seq.).

~~(bbcc)~~ "Placard" means a visible indicator supplied by the Air Resources Board to indicate that an engine or equipment has been registered in the Portable Equipment Registration Program and is in addition to the registration identification device.

~~(eedd)~~ "Portable" means designed and capable of being carried or moved from one location to another. Indicia of portability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform. For the purposes of this regulation, dredge engines on a boat or barge are considered portable. The engine or equipment unit is not portable if any of the following are true:

- (1) the engine or equipment unit or its replacement is attached to a foundation, or if not so attached, will reside at the same location for more than 12 consecutive months. The period during which the engine or equipment unit is maintained at a storage facility shall be excluded from the residency time determination. Any engine or equipment unit such as back-up or stand-by engines or equipment units, that replace engine(s) or equipment unit(s) at a location, and is intended to perform the same or similar function as the engine(s) or equipment unit(s) being replaced, will be included in calculating the consecutive time period. In that case, the cumulative time of all engine(s) or equipment unit(s), including the time between the removal of the original engine(s) or equipment unit(s) and installation of the replacement engine(s) or equipment unit(s), will be counted toward the consecutive time period; or

- (2) the engine or equipment unit remains or will reside at a location for less than 12 consecutive months if the engine or equipment unit is located at a seasonal source and operates during the full annual operating period of the seasonal source, where a seasonal source is a stationary source that remains in a single location on a permanent basis (at least two years) and that operates at that single location at least three months each year; or
- (3) the engine or equipment unit is moved from one location to another in an attempt to circumvent the portable residence time requirements.

~~(ddee)~~ **"Prevention of Significant Deterioration (PSD)"** means any federal requirements contained in or promulgated pursuant to Part C of the federal Clean Air Act.

~~(eeff)~~ "Process" means any air-contaminant-emitting activity associated with the operation of a registered engine or equipment unit.

~~(ffgg)~~ "Project, for the purposes of onshore operation," means the use of one or more registered engines or equipment units operated under the same or common ownership or control to perform a single activity.

~~(gghh)~~ **"Project, for the purposes of State Territorial Waters (STW),"** means the use of one or more registered engines and equipment units operating under the same or common ownership or control to perform any and all activities needed to fulfill specified contract work that is performed in STW. For the purposes of this definition, a contract means verbal or written commitments covering all operations necessary to complete construction, exploration, maintenance, or other work. Multiple or consecutive contracts may be considered one project if they are intended to perform activities in the same general area, the same parties are involved in the contracts, or the time period"specified in the contracts is determined by the Executive Officer to be sequential.

~~(hhij)~~ "Provider of Essential Public Service (PEPS)" means any privately-owned corporation or public agency that owns, operates, controls, or manages a line, plant, or system for the transportation of people or property, the transmission of telephone or telegraph messages, or the production, generation, transmission or furnishing of heat, light, water, power, or sanitation directly or indirectly to the public.

~~(ijii)~~ "Registration" means issuance of a certificate by the Executive Officer acknowledging expected compliance with the applicable requirements of this article, and the intent **by** the owner or operator to operate the engine or equipment unit within the requirements established by this article.

- (jjkk) "Rental Business" means a business which rents or leases registered engines or equipment units.
- (kkll) "Renter" means a person who rents and/or operates registered engines or equipment units not owned by that person.
- (llmm) "Resident Engine" means either of the following:
- (1) a portable engine that at the time of applying for registration, has a current, valid district permit or registration that was issued prior to January 1, 2006, or an engine that lost a permit to operate exemption through a formal district action. Moving an engine from a district that provides a permit to operate exemption to a district that requires a permit to operate or registration does not qualify for consideration as a resident engine; or
 - (2) a certified compression-ignition engine that operated in California at any time between March 1, 2004 and October 1, 2006. The responsible official shall provide sufficient documentation to prove the engine's residency to the satisfaction of the Executive Officer. Examples of adequate documentation include but are not limited to: tax records, purchase records, maintenance records, or usage records.

An engine permitted or registered by a district pursuant to title 17, CCR, section 93116.3(b)(6) is not a resident engine.

- (mmnn) "Responsible Official" refers to an individual employed by the company or public agency with the authority to certify that the registered engines or equipment units under his/her jurisdiction comply with applicable requirements of this regulation. A company or public agency may have more than one Responsible Official.
- (AAoo) "Spark-Ignition (SI) Engine" means an internal combustion engine with a spark plug (or other sparking device) with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark-ignition engines usually use a throttle instead of using fuel supply to control intake air flow to regulate power.
- (eepp) "**State** Territorial Waters (STW)" includes all of the following: an expanse of water that extends from the California coastline to 3 miles off-shore; a 3 mile wide belt around islands; and estuaries, rivers; and other inland waterways.
- (ppqq) "**Statewide** Registration Program" means the program for registration of portable engines and equipment units set out in this article.
- (eerr) "Stationary Source" means any building, structure, facility or installation which emits any air contaminant directly or as a fugitive emission. "Building," "structure," "facility," or "installation" includes all pollutant emitting activities which:
- (1) are under the same ownership or operation, or which are owned or operated by entities which are under common control;
 - (2) belong to the same industrial grouping either by virtue of falling within the same two-digit standard industrial classification code or by virtue of being

part of a common industrial process, manufacturing process, or connected process involving a common raw material; and

(3) are located on one or more contiguous or adjacent properties.

[Note: For the purposes of this regulation a stationary source and nonroad engine are mutually exclusive.]

(~~##~~ss) "Storage" means a warehouse, enclosed yard, or other area established for the primary purpose of maintaining registered engines or equipment units when not in operation.

(ttl) "Street Sweeper" means the same as "Dual-engine Street Sweeper" defined in title 13, CCR, section 2022(b)(2).

(~~ss~~uu) "Tactical Support Equipment (TSE)" means equipment using a portable engine, including turbines, that meets military specifications, owned by the U.S. Department of Defense, the U.S. military services, or its allies, and used in combat, combat support, combat service support, tactical or relief operations, or training for such operations. Examples include, but are not limited to, internal combustion engines associated with portable generators, aircraft start carts, heaters and lighting carts.

(~~tt~~vv) "Third-party Rental" means a non-rental business renting or leasing registered engines and/or equipment units to another party by written agreement.

(~~uu~~ww) "Tier 1 Engine" means a certified compression-ignition engine according to the horsepower and model year as follows:

≥50 bhp and <100 bhp; 1998 through 2003
 ≥100 bhp and <175 bhp; 1997 through 2002
 ≥175 bhp and <300 bhp; 1996 through 2002
 ≥300 bhp and <600 bhp; 1996 through 2000
 ≥600 bhp and ≤750 bhp; 1996 through 2001
 >750 bhp; 2000 through 2005.

(~~vv~~xx) "Tier 2 Engine" means a certified compression-ignition engine according to the horsepower and model year as follows:

≥50 bhp and <100 bhp; 2004 through 2007
 ≥100 bhp and <175 bhp; 2003 through 2006
 ≥175 bhp and <300 bhp; 2003 through 2005
 ≥300 bhp and <600 bhp; 2001 through 2005
 ≥600 bhp and ≤750 bhp; 2002 through 2005
 >750 bhp; 2006 through 2010.

(~~ww~~yy) "Transportable" means the same as portable.

(~~xx~~zz) "U.S. EPA" means the United States Environmental Protection Agency.

(~~yy~~aaa) "Vendor" means a seller or supplier of portable engines or equipment units for use in California.

(zzbbb) "Volatile Organic Compound (VOC)" means any compound containing at least one atom of carbon except for the following exempt compounds: acetone, ethane, parachlorobenzotrifluoride (1-chloro-4-trifluoromethyl benzene), methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonates, methylene chloride (dichloromethane), methyl chloroform (1,1,1-trichloroethane), CFC-113 (trichlorotrifluoroethane), CFC-11 (trichlorofluoromethane), CFC-12 (dichlorodifluoromethane), CFC-22 (chlorodifluoromethane), CFC-23 (trifluoromethane), CFC-114 (dichlorotetrafluoroethane), CFC-115 (chloropentafluoroethane), HCFC-123 (dichlorotrifluoroethane), HFC-134a (tetrafluoroethane), HCFC-141 b (dichlorofluoroethane), HCFC-142b (chlorodifluoroethane), HCFC-124 (chlorotetrafluoroethane), HFC-23 (trifluoromethane), HFC-134 (tetrafluoroethane), HFC-125 (pentafluoroethane), HFC-143a (trifluoroethane), HFC-152a (difluoroethane), cyclic, branched, or linear completely methylated siloxanes, the following classes of perfluorocarbons:

- (1) cyclic, branched, or linear, completely fluorinated alkanes;
- (2) cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;
- (3) cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and
- (4) sulfur-containing perfluorocarbons with no unsaturations and with the sulfur bonds to carbon and fluorine, acetone, ethane, and parachlorobenzotrifluoride (1-chloro-4-trifluoromethyl benzene).

NOTE: Authority cited: Sections 39600, 39601, 41752, 41753, 41754, 41755, 43013(b) and 43018, Health and Safety Code. Reference: Sections 41750, 41751, 41752, 41753, 41754, and 41755, Health and Safety Code.

§ 2453. Application Process.

- (a) In order for an engine or equipment unit to be considered for registration by the Executive Officer, the engine or equipment unit must be portable as defined in section 2452 (e) and meet all applicable requirements established in this article.
- (b) For purposes of registration under this article, an engine and the equipment unit it serves are considered to be separate emissions units and require separate applications.
- (c) For an identical replacement, an owner or operator of a registered portable engine or equipment unit is not required to complete a new application and may immediately operate the identical replacement. Except for TSE, the owner or operator shall notify the Executive Officer in writing within five calendar days of replacing the registered engine or equipment unit with an identical replacement. Notification shall include company name, responsible official, phone number,

registration certificate number of the engine or equipment unit to be replaced; and make, model, rated brake horsepower, serial number of the identical replacement, description of the mechanical breakdown; and applicable fees as required in section 2461. Misrepresentation of engine or equipment unit information or the failure to meet the requirements of this regulation shall be deemed a violation of this article.

- (d) The Executive Officer shall inform the applicant, in writing, if the application is complete or deficient, within 30 days of receipt of an application. If deemed deficient, the Executive Officer shall identify the specific information required to make the application complete.
- (e) The Executive Officer shall issue or deny registration within 90 days of receipt of a complete application.
- (f) Upon finding that an engine or equipment unit meets the **requirements** of this article, the Executive **Officer** shall issue a registration for the engine or equipment unit. The Executive Officer shall notify the applicant in writing that the engine or equipment unit has been registered. The notification shall include a registration certificate, any conditions to ensure compliance with State and federal requirements, and a registration identification device for each engine or equipment unit registered pursuant to this regulation. Except for TSE, the registration identification device shall be **affixed** on the engine or equipment unit at all times, and the registration certificate including operating conditions shall be kept on the immediate premises with the engine or equipment at all times and made accessible to the Executive Officer or district upon request. Failure to properly maintain the registration identification device shall be deemed a violation of this article.
- (g) Except for TSE, each application for registration and the appropriate fee(s) as specified in section 2461, shall be submitted in a format approved by the Executive Officer and include, at a minimum, the following information:
 - (1) indication of general nature of business (e.g., rental business, etc.);
 - (2) the name of applicant, including mailing **address** and telephone number;
 - (3) a brief description of typical engine or equipment-unit use;
 - (4) detailed description, including engine or equipment-unit make, model, manufacture year (for portable engines only), rated brake horsepower, throughput, capacity, emission control equipment, and serial number;
 - (5) necessary engineering data, emissions test data, or manufacturer's emissions data to demonstrate compliance with the requirements as specified in sections 2455, 2456, and 2457;
 - (6) for resident engines, a copy of either a current permit to operate that was granted by a district, or documentation as described in section **2452 (4mm)**; and
 - (7) the printed name and signature of the responsible official and date of the signature.

- (h) For TSE, application for registration and the appropriate fee(s) as specified in section 2461, shall be submitted in a format approved by the Executive Officer and include, at a minimum, the following information:
 - (1) the name of applicant, including mailing address and telephone number;
 - (2) a brief description of typical engine or equipment-unit use;
 - (3) engine or equipment-unit description, including type and rated brake horsepower; and
 - (4) the printed name and signature of the responsible official and date of the signature.

- (i) All registered engines and equipment units shall have a designated home district as defined in section 2452 (AQ) according to the following:
 - (1) Owners holding valid registration(s) prior to the effective date shall designate in writing to the Executive Officer a home district within 90 days of the effective date of this regulation. The Executive Officer shall designate the home district for any and all registered engines and equipment units for existing registration program participants that fail to designate a home district;
 - (2) a home district shall be designated on each application for initial registration of an engine or equipment **unit**; and
 - (3) except for registered engines or equipment units owned by a rental business or involved in a third part rental, if the engine or equipment unit, based on averaging of annual operation in each district from the three annual reports submitted during the 3 year registration cycle, operated the largest percentage of the time in a district other than the designated home district, the owner shall change the home district designation at the time of renewal. The change is not required if the difference between the home district operation percentage and the district with the largest operating percentage is 5 percent or less.

- (j) Engines or equipment units owned and operated for the primary purpose of rental by a rental business shall be identified as rental at the time of application for registration and shall be issued a registration specific to the rental business requirements of this article. Misrepresentation of portable engine or equipment unit use in an attempt to qualify under the rental business definition shall be deemed a violation of this article.

- (k) New applications for non-operational engines or equipment units will not be accepted by the Executive Officer.

- (l) Once registration is issued by the Executive Officer, district permits or registrations for engines or equipment units registered in the Statewide Registration Program are preempted by the statewide registration and are, therefore, considered null and void, except for the following circumstances where a district permit shall be required:

- (1) engines or equipment units used in a project(s) operating in the OCS. The requirements of the district permit or registration apply to the registered engine or equipment unit while operating at the project(s) in the OCS; or
- (2) engines or equipment units used in a project(s) operating in both the OCS and STW. The requirements of the district permit or registration apply to the registered engine or equipment unit while operating at the project(s) in the OCS and STW; or
- (3) at STW project(s) that trigger district emission offset thresholds; or
- (4) at any specific location where statewide registration is not valid. The owner of the engine or equipment unit shall obtain a district permit or registration for the location(s) where the statewide registration is not valid; or
- (5) at any location where an engine or equipment unit that has been determined to cause a public nuisance as defined in Health and Safety Code Section 41700.

Under no circumstances shall a portable engine or equipment unit be operated under both statewide registration and a district permit at any specific location. Where both a district permit for operation at a specific location and statewide registration have been issued for an engine or equipment unit, the terms of the district permit shall take precedence at that location.

- (m) When ownership of a registered engine or equipment unit changes, the new owner shall submit a change of ownership application. This application shall be filed within 30 days of the change of ownership. During the 30 day period the new owner is authorized to operate the registered engine or equipment unit. If an application is not received within 30 days, the engine or equipment unit may not operate and the existing registration is not valid for the new owner until the application has been filed and all applicable fees have been paid. Registration will be reissued to the new owner after a complete application has been approved by the Executive Officer.
- (n) Except for TSE, a placard shall be required for every engine or equipment unit registered in the Statewide Registration Program. The placard shall be affixed on the registered engine or equipment unit at all times so that it may be easily viewed from a distance. Placards shall be purchased at the time of the first renewal or at the time of initial registration, whichever ever occurs first. Failure to properly maintain the placard shall be deemed a violation of this article.

NOTE: Authority cited: Sections 39600, 39601, 41752, 41753, 41754, 41755, 43013(b) and 43018, Health and Safety Code. Reference: Sections 41750, 41751, 41752, 41753, 41754, and 41755, Health and Safety Code.

§ 2454. Registration Process.

- (a) The Executive Officer shall make registration data available to the districts via the Internet.

- (b) The Executive Officer may conduct an inspection of an engine or equipment unit and/or require a source test in order to verify compliance with the requirements of this article prior to issuance of registration.
- (c) After obtaining registration in accordance with this article, an owner or operator of the registered engines or equipment units:
 - (1) shall comply with all conditions set forth in the issued registration. Failure to comply with such conditions shall be deemed a violation of this article; and
 - (2) may operate within the boundaries of the State of California so long as such registered engines or equipment units comply with all applicable requirements of this article and any other applicable federal or State law.
- (d) Districts shall provide the Executive Officer with written reports or electronic submittals via the Internet, describing any inspections and the nature and outcome of any violation of local, State or federal laws by the owner or operator of registered engines or equipment units. The Executive Officer shall make available to all districts such information via the Internet.

NOTE: Authority cited: Sections 39600,39601,41752,41753,41754,41755, 43013(b) and 43018, Health and Safety Code. Reference: Sections 41750,41751,41752, 41753, 41754, and 41755, Health and Safety Code.

§ 2455. General Requirements.

- (a) The emissions from engines or equipment units registered under this article shall not, in the aggregate, interfere with the attainment or maintenance of any California or federal ambient air quality standard. The emissions from one or more registered engines or equipment units, exclusive of background concentration, shall not cause an exceedance of any ambient air quality standard. This paragraph shall not be construed as requiring operators of registered engines or equipment units to provide emission offsets for engines or equipment units registered under this article.
- (b) Engines or equipment units registered under this article shall comply with article 1, chapter 3, part 4, division 26 of the California Health and Safety Code, commencing with section 41700.
- (c) Except for engines or equipment units permitted or registered by a district in which an emergency event occurs, an engine or **equipment** unit operated during an emergency event as defined in section 2452 (j) of this article, is considered registered under the requirements of this article for the duration of the emergency event and is exempt from sections 2455,2456,2457,2458, and 2459 of this article for the duration of the emergency event provided the owner or operator notifies the Executive Officer within 24 hours of commencing operation. The Executive Officer may for good cause refute that an emergency event under this provision exists. If the Executive Officer deems that an emergency event does not exist, all operation of engines and equipment units covered by this provision

shall cease operation immediately upon notification by the Executive Officer. Misrepresentation of an emergency event and failure to ~~cease~~ operation under notice of the Executive Officer shall be deemed a violation of this article.

- (d) For the purposes of registration under this article, the owner or operator of a registered equipment unit must notify the U.S. EPA and comply with 40 CFR 52.21 if:
- (1) the registered equipment unit operates at a major stationary source under 40 CFR 51.166 or 52.21, and
 - (A) the major stationary source is located within 10 kilometers of a Class I area; or
 - (B) the registered equipment unit, operating in conjunction with other registered equipment units, operates at the major stationary source and its operation would be defined as a major modification to the stationary source under 40 CFR 51.166 or 52.21 ; or
 - (2) the registered equipment unit, operating in conjunction with other registered equipment units, would be defined as a major stationary source, as defined under 40 CFR 51.166 or 52.21.

NOTE: Authority cited: Sections 39600, 39601, 41752, 41753, 41754, 41755, 43013(b) and 43018, Health and Safety Code. Reference: Sections 41750, 41751, 41752, 41753, 41754, and 41755, Health and Safety Code.

§ 2456. Engine Requirements.

- (a) For TSE, no air contaminant shall be discharged into the atmosphere, other than uncombined water *vapor*, for a period or periods aggregating more than three minutes in any one hour which is as dark or darker in shade as that designated as NO.2 on the Ringelmann Chart, as published by the United States Bureau of Mines, or of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke designated as NO.2 on the Ringelmann Chart. No other requirements of this section are applicable to TSE.
- (b) Registered diesel pile-driving hammers shall comply with the applicable provisions of section 41701.5 of the California Health and Safety Code and are otherwise exempt from further requirements of this section.
- (c) Registered diesel engines used on a crane shall comply with the applicable requirements in title 13, CCR, section 2449 and are otherwise exempt from further requirements of this section, except for subsection (f)(5).
- (d) Registered diesel engines used on a street sweeper that are not Subject to the requirements of title 13, CCR, section 2022 shall comply with the applicable requirements in title 13, CCR, section 2025 and are otherwise exempt from further requirements of this section, except for subsection (f)(5).

- (~~ee~~) To be registered in the Statewide Registration Program, a registered engine rated less than 50 brake horsepower shall be a certified compression-ignition engine or a certified spark-ignition engine, unless no emission standards exist for that brake horsepower and year of manufacture. In that event, the engine shall comply with the applicable daily and annual emission limits contained in section 2456 (~~ef~~)(6) of this article. No other requirements of this section are applicable to portable engines rated less than 50 brake horsepower.
- (~~ef~~) After January 1, 2006, engines rated equal to, or greater than 50 bhp registered under this article shall:
- (1) be certified compression-ignition engines or certified spark-ignition engines that meet the most stringent emissions standard in effect for the applicable horsepower range at the time the application is submitted by the responsible official. Spark-ignition engines that are not certified spark-ignition engines may be registered if they meet the emission standards in Table 1. Subsection (~~ef~~)(1) does not apply to certified compression-ignition engines built under the flexibility provisions listed in 40 CFR part 89.102, engines that are resident engines, changes of ownership, or engines that meet the requirements of title 17, CeR, sections 93116.3(b)(7) or 93116.3.1.
 - (2) meet all applicable requirements in title 17, CCR, sections 93116 through 93116.5;
 - (3) use only fuels meeting the standards for California motor vehicle fuels as set forth in chapter 5, division 3, title 13, CCR, commencing with section 2250, or other fuels and/or additives that have been verified through the Verification Procedure for In-Use Strategies to Control Emissions from Diesel Engines;
 - (4) not exceed particulate matter emissions concentration of 0.1 grain per standard dry cubic feet corrected to 12 percent CO₂. This provision does not apply to certified compression-ignition engines, certified spark-ignition engines, or any spark-ignition engine meeting Table 1 requirements;
 - (5) not discharge air contaminants into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as or darker than Ringelmann 1 or equivalent 20 percent opacity; and
 - (6) not exceed the following emission limits:
 - (A) 550 pounds per day per engine of carbon monoxide (CO);
 - (B) 150 pounds per day per engine of particulate matter less than 10 microns (PM₁₀);
 - (C) for registered engines operating onshore, 10 tons for each-pollutant per district per year per engine for NO_x, SO_x, VOC, PM₁₀, and CO in nonattainment areas; and

- (D) for registered engines operating within STW:
- (1) the offset requirements of the corresponding onshore district apply. Authorization from the corresponding onshore district is required prior to operating within STW. If authorization is in the form of a current district permit, the terms and conditions of the district permit supersede the requirements of the statewide registration for the project, except that the most stringent of the technology and emission concentration limits required by the district permit or statewide registration are applicable. If the registered engine does not have a current district permit, the terms and conditions of the statewide registration apply, and the corresponding onshore district may require offsets pursuant to district rules and regulations. The requirement for district offsets shall not apply to the owner or operator of an engine(s) registered in the statewide registration program when the engine(s) is operated at a stationary source permitted by the district; and
 - (2) the corresponding onshore district may perform an ambient air quality impact analysis (AQIA) for the proposed project prior to granting authorization. The owner or operator of engine(s) registered in the statewide registration program shall be required, at the request of the district, to submit any information deemed by the district to be necessary for performing the AQIA. Statewide registration shall not be valid at any location where the AQIA demonstrates a potential violation of an ambient air quality standard.
- (E) for registered engines operating in the South Coast Air Quality Management District (SCAQMD), 100 pounds nitrogen oxides (NOx) per project per day [An owner may substitute SCAQMD permit or registration limits in effect on or before September 17, 1997 (optional)];
- (F) 100 pounds NOx per registered engine per day, except in SCAQMD where the limit is 100 pounds NOx per project per day.
- (7) In lieu of (6)(E) and (6)(F) above, operation of a registered new nonroad engine rated at 750 brake horsepower or greater for which a federal or California standard pursuant to 40 CFR Part 89 or title 13, CCR has not yet become effective, shall not exceed 12 hours per day.
 - (8) For registered engines that operate in both 8TW and onshore, the 10 tons per district per year per engine limit in (6)(C) above shall only apply onshore.
 - (9) For certified compression-ignition engines, certified spark-ignition engines, or any spark-ignition engine meeting Table 1 requirements, the daily and annual emission limitations in section 6 above shall not apply.
 - (10) Effective January 1, 2010, all registered spark-ignition engines rated at 50 brake horsepower or greater shall be certified spark-ignition engines or

shall meet Table 1 requirements. For those spark ignition engines that are not certified spark-ignition engines or do not meet Table 1 requirements, the registration shall expire on December 31, 2009 and the engine will not be allowed to operate under the authority of this regulation.

- (eg) All registered engines shall be equipped with a functioning non-resettable hour meter, fuel meter or other operation tracking device approved by the Executive Officer. Engines registered prior to the **effective** date of this regulation, that are not equipped with a functional non-resettable hour meter, fuel meter or other operation tracking device shall install one and notify ARB in writing within 6 months of the effective date of this regulation.
- (fh) Registered TSE is exempt from district New Source Review and Title V programs, including any offset requirements. Further, emissions from registered TSE shall not be included in Title V or New Source Review applicability determinations.

NOTE: Authority cited: Sections 39600,39601,41752,41753,41754,41755, 43013(b) and 43018, Health and Safety Code. Reference: Sections 41750,41751,41752, 41753,41754, and 41755, Health and Safety Code.

Table 1 Spark-ignition Engine Requirements*

<i>Pollutant Emission Limits</i>		
<i>NOx**</i>	<i>VOC**</i>	<i>CO**</i>
80 ppm _{dv} NO _x (1.5 g/bhp-hr)	240 ppm _{dv} voe (1.5 g/bhp-hr)	176 ppm _{dveo} (2.0 g/bhp-hr)

* These requirements are in addition to requirements of section 2455 and 2456.

** For the purpose of compliance with this article, ppm_{dv} is parts per million @ 15 percent oxygen averaged over 15 consecutive minutes. Limits of ppm_{dv} are the approximate equivalent to the stated grams per brake horsepower hour limit based on assuming the engine is 24.2 percent efficient.

§ 2457. Requirements for Registered Equipment Units.

- (a) Emissions from a registered equipment unit, exclusive of emissions emitted directly from the associated portable engine, shall not exceed:
- (1) 10 tons per year per district of PM10; and
 - (2) 82 pounds per project per day of PM10.
 - (3) For registered equipment units that operate within 8TW and onshore, emissions released while operating both in 8TW and onshore shall be included toward the 10 tons per year limit.
- (b) Registered equipment units shall also meet the following applicable requirements:
- (1) Confined abrasive blasting operations:
 - (A) no air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in anyone hour which is as dark as or darker than Ringelmann 1 or equivalent 20 percent opacity;
 - (B) the particulate matter emissions shall be controlled using a fabric or cartridge filter dust collector;
 - (C) as a part of application for registration, the applicant shall provide manufacturer's specifications or engineering data to demonstrate a minimum particulate matter control of 99 percent for the dust collection equipment;
 - (D) except for vent filters, each fabric dust collector shall be equipped with an operational pressure differential gauge to measure the pressure drop across the filters; and
 - (E) there shall be no visible emissions beyond the property line on which the equipment is being operated.
 - (2) Concrete batch plants:
 - (A) all dry material transfer points shall be ducted through a fabric or cartridge type filter dust collector, unless there are no visible emissions from the transfer point;
 - (B) all cement storage silos shall be equipped with fabric or cartridge type vent filters;
 - (C) the silo vent filters shall be maintained in proper operating condition;
 - (D) no air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in anyone hour which is as dark as or darker than Ringelmann 1 or equivalent 20 percent opacity;
 - (E) open areas and all roads subject to vehicular traffic shall be paved, watered, or chemical palliatives applied to prevent fugitive emissions in excess of 20 percent opacity or Ringelmann 1;

- (F) silo service hatches shall be dust-tight;
 - (G) as a part of application for registration, the applicant shall provide manufacturer's specifications or engineering data to demonstrate a minimum particulate matter control of 99 percent for the fabric dust collection" equipment;
 - (H) except for vent filters, each fabric dust collector shall be equipped with an operational pressure differential gauge to measure the pressure drop across the filters;
 - (I) all aggregate transfer points shall be equipped with a wet suppression system to control fugitive particulate emissions unless there are no visible emissions;
 - (J) all conveyors shall be covered, unless the material being transferred results in no visible emissions;
 - (K) wet suppression shall be used on all stockpiled material to control fugitive particulate emissions, unless the stockpiled material results in no visible emissions; and
 - (L) there shall be no visible emissions beyond the property line on which the equipment is being operated.
- (3) Sand and gravel screening, rock crushing, and pavement crushing and recycling operations:
- (A) no air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in anyone hour which is as dark as or darker than Ringelmann 1 or equivalent 20 percent opacity;
 - (B) there shall be no visible emissions beyond the property line on which the equipment is being operated;
 - (C) all transfer points shall be ducted through a fabric or cartridge type filter dust collector, or shall be equipped with a wet suppression system maintaining a minimum moisture content unless there are no visible emissions;
 - (D) – particulate matter emissions from each crusher shall be ducted through a fabric dust collector, or shall be equipped with a wet suppression system which maintains a minimum moisture content to ensure there are no visible emissions;
 - (E) all conveyors shall be covered, unless the material being transferred results in no visible emissions;
 - (F) all stockpiled material shall be maintained at a minimum moisture content unless the stockpiled material results in no visible emissions;
 - (G) as a part of application for registration, the applicant shall provide manufacturer's specifications or engineering data to demonstrate a minimum particulate matter control of 99 percent for the fabric dust" collection equipment;
 - (H) except for vent filters, each fabric dust collector shall be equipped with an operational pressure differential gauge to measure the pressure drop across the filters;

- (I) open areas and all roads subject to vehicular traffic shall be paved, watered, or chemical palliatives applied to prevent fugitive emissions in excess of 20 percent opacity or Ringelmann 1; and
 - (J) if applicable, the operation shall comply with the requirements of 40 CFR Part 60 Subpart 000.
- (4) Unconfined abrasive blasting operations:
- (A) no air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in anyone hour which is as dark as or darker than Ringelmann 2 or equivalent 40 percent opacity;
 - (B) only California Air Resources Board-certified abrasive blasting material shall be used [Note: see title 17, CCR, section 92530 for certified abrasives.];
 - (C) the abrasive material shall not be reused;
 - (D) no air contaminant shall be released into the atmosphere which causes a public nuisance;
 - (E) all applicable requirements of title 17, CCR shall also apply; and
 - (F) there shall be no visible emissions beyond the property line on which the equipment is being operated.
- (5) Tub grinders and trommel screens:
- (A) there shall be no visible emissions beyond the property line on which the equipment is being operated;
 - (B) no air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in anyone hour which is as dark or darker than Ringelmann 1 or equivalent 20 percent opacity; and
 - (C) water suppression or chemical palliatives shall be used to control fugitive particulate emissions from the tub grinder whenever the tub grinder is in operation, unless there are no visible emissions.
- (c) Registered equipment units not described in section 2457(b) above, shall be subject to the most stringent district Best Available Control Technology (BACT) requirements in effect for that category of source at the time of application for registration.
- (d) No change in equipment unit configuration, operating scenario, or number of transfer points from that set out in the registration for the equipment unit shall be made unless a complete application for modification has been filed and approved by the Executive Officer prior to operation.

§ 2458. Recordkeeping and Reporting.

- (a) Except for registered engines owned by a rental business, used in a third-party rental, operated by a PEPS, used on a crane, used on a street sweeper, or TSE, the owner of registered engines, including engines otherwise preempted under section 209 (e) of the federal Clean Air Act, or registered equipment units shall maintain records of operation of each registered engine and equipment unit. Recordkeeping for engines not previously required to maintain records shall begin upon the effective date of the regulation or January 1, 2007, which ever is later. For engines not previously required to have an hour meter, fuel meter or other device approved by the Executive Officer, the owner or operator shall record hours of operation until the hour meter, fuel meter or other device approved by the Executive Officer has been installed. The records shall be maintained at a central place of business for five years, and made accessible to the Executive Officer or districts upon request. Records shall be maintained in a format approved by the Executive Officer and include, at a minimum, all of the following:
- (1) engine or equipment unit registration number;
 - (2) recordings from an hour meter, fuel meter, or other device approved by the Executive Officer, and the corresponding dates of the recordings for each registered engine or equipment unit based on the following:
 - (A) for each project as defined in 2452 (ffg) or (ggh), readings shall be recorded prior to the commencement of operation and at the completion of the project; or
 - (B) for ongoing operation of a registered engine or equipment unit at multiple locations within a stationary source, readings shall be recorded at the beginning and end of each calendar week; or
 - (C) for each location, readings shall be recorded prior to commencement of operation and upon completion of operation at that location.
 - (3) For registered engines and equipment units sUbject to a daily operational limitation, daily records of either hours of operation, fuel usage, or process throughput as applicable.
 - (4) For equipment units subject to the requirements of section 2457(b)(3), daily throughput shall be the sum of measurements of material introduced into the equipment unit. These measurements shall be taken at the initial loading point(s) of the equipment unit.
 - (5) recordings from an hour meter, fuel meter, or other device approved by the Executive Officer and the corresponding dates of the recordings any time an engine or equipment unit is undergoing service, repair, or maintenance; and
 - (6) for each start and stop reading specified in (2) and (3) above, the location identified by district, county, or other indicator (Le., street address, UTM coordinates, etc.)

- (b) A rental business or the owner of a registered engine or equipment unit involved in a third party rental, shall maintain records for each rental or lease transaction. The written rental or lease agreement shall be kept onsite with the registered engine or equipment unit at all times. Recordkeeping for registered engines not previously required to maintain records shall begin upon the effective date of the regulation or January 1, 2007, whichever is later. For registered engines not previously required to have an hour meter, fuel meter or other device approved by the Executive Officer, the owner or operator shall record hours of operation until the hour meter, fuel meter or other device approved by the Executive Officer has been installed. The owner shall provide each person who rents a registered engine or equipment unit with a written copy of applicable requirements of this article, including recordkeeping and notification requirements, as a part of the agreement. The records, including written acknowledgment by each renter of the registered engine or equipment unit of having received the above information, shall be maintained by the rental business or the owner of the registered engine or equipment unit involved in a third-party rental at a central location for five years, and made accessible to the Executive Officer or districts upon request. Records shall be maintained in a format approved by the Executive Officer and include, at a minimum, for each rental engine all of the following:
- (1) registered engine registration number;
 - (2) dates for the start and end of the rental transaction;
 - (3) hours of operation for each rental period including the hour meter reading at the start of the rental transaction and the hour meter reading at the end of the rental transaction; and
 - (4) location of use (by district, county or other indicator (i.e., street address, UTM coordinates, etc.)).
- (c) For TSE, each military installation shall provide the Executive Officer an annual report, in a format approved by the Executive Officer, within 60 days after the end of each calendar year. The report shall include the number, type, and rating of registered TSE at each installation as of December 31 of that calendar year, and be accompanied by the applicable fees pursuant to section 2461. Any variation of registered TSE to actual TSE shall be accounted for in this annual report, and the Executive Officer shall issue an updated TSE list accordingly. A renewal registration will be issued with the updated TSE list every three years according to expiration date.
- (d) For each registered engine subject to the requirements of title 17, CCR, section 93116, the owner shall keep records and submit reports in accordance with title 17, CCR, section 93116.4.

- (e) Except for registered engines or equipment units owned by a rental business, used in a third-party rental, operated by a PEPS, used on a crane, used on a street sweeper, or TSE, the owner of a registered engine or equipment unit shall provide the Executive Officer an annual report signed by the responsible official, in a format approved by the Executive Officer, by March 1 of each calendar year containing all of the following information:
- (1) the reporting year;
 - (2) the registration number of each registered engine and/or equipment unit;
 - (3) for registered engines, quarterly summaries for each district or county the total fuel usage in gallons per quarter, or total hours of operation per quarter, for each registered engine; and
 - (4) for registered equipment units, quarterly summaries for each district or county in which the registered equipment unit was operated and the total process weight or throughput.
- (f) The owner of a registered engine or equipment unit owned by a rental business or used in a third-party rental transaction shall provide the Executive Officer an annual report signed by the responsible official, in a format approved by the Executive Officer, by March 1 of each calendar year containing all of the following information:
- (1) the reporting year;
 - (2) the registration number of each registered engine and/or equipment unit;
 - (3) total hours of operation for the reporting year for each registered engine based on, and including, beginning and ending annual hour meter readings and dates upon which the total hours of annual operation calculation is based;
 - (4) list of all counties in which the registered engine operated in during the reporting year as reported by the entity(ies) that operated the registered engine;
 - (5) estimate of the percentage of total hours for each engine operated in each of the counties identified in (4) above; and
 - (6) for registered equipment units, quarterly and annual summaries for each district or county in which the registered equipment unit was operated and the total process weight or throughput.
- (g) the owner or operator of a registered engine or equipment unit used by a PEPS shall provide the Executive Officer an annual report, in a format approved by the Executive Officer, by March 1st of each calendar year containing all of the following information:
- (1) the reporting year;
 - (2) the registration number of each registered engine and/or equipment unit;
 - (3) total hours of operation; and
 - (4) estimate of the percentage of hours or fuel usage for the three counties in which the registered engine or equipment unit operated the most.

- (h) Records requests made by a district or Executive Officer shall be made to the responsible official. The responsible official shall provide the requested records within 30 days from receipt of the request. Failure to provide the records by the specified date shall be deemed a violation of this article.
- (i) Each district shall provide the Executive Officer with an annual report, in a format approved by the Executive Officer, by March 31 following the year in which the information was collected containing all of the following information:
 - (1) the number of portable engines and equipment units inspected;
 - (2) the number of portable engines and/or equipment units found operating without valid district permits or statewide registrations;
 - (3) the number of registered engines and equipment units inspected; and
 - (4) summary of results of inspections.
- (j) Vendors selling new portable engines and/or equipment units in California shall:
 - (1) notify the buyer about this regulation; and
 - (2) on a monthly basis submit to the Executive Officer the number of portable engines and/or portable equipment units sold by the vendor for use in California including: the name, address, and contact information of the purchaser, and description of the engine and/or equipment unit including make, model, and engine family name.
- (k) Registered diesel engines used on a crane shall comply with the applicable requirements in title 13, CCR, section 2449 and are otherwise exempt from the requirements of this section.
- (l) Registered diesel engines used on a street sweeper that are not subject to the requirements of title 13, CCR, section 2022 shall comply with the applicable requirements in title 13, CCR, section 2025 and are otherwise exempt from the requirements of this section.

NOTE: Authority cited: Sections 39600,39601,41752,41753,41754,41755, 43013(b) and 43018, Health and Safety Code. Reference: Sections 41750,41751,41752,41753, 41754, and 41755, Health and Safety Code.

§ 2459. Notification.

- (a) Except as listed in subsection (d) of this section, if a registered equipment unit will be at a location for more than five days, the owner or operator of that registered equipment unit, shall notify the district in writing in a format approved by the Executive Officer, within two working days of commencing operations in that district. If the registered equipment unit is to be moved to different locations within the same district, the owner or operator shall be Subject to the notification requirements above, unless the owner or operator and the district, by mutual

agreement, arrange alternative notification requirements on a case-by-case basis. The notification shall include all of the following:

- (1) the registration number of the registered equipment unit;
 - (2) the name **and** phone number of the responsible official or renter with information concerning the locations where the registered equipment unit will be operated within the district; and
 - (3) estimated time the registered equipment unit will be located in the district.
- (b) If the **district** has not been notified as required in section 2459(a) above, because the owner or operator did not reasonably expect the duration of operation to trigger the" notification requirement in section 2459(a) **above**, the owner or operator shall notify the district, in a format approved **by** the Executive Officer, within 12 hours of determining the registered equipment unit will be operating at a location more than five days.
- (c) Owners and operators of TSE are not subject to the notification requirements of this section 2459.
- (d) For STW projects, the owner or operator of a registered engine or registered equipment unit shall notify the corresponding onshQre district in writing, in a format approved by the Executive Officer at least 14 days in advance of commencing operations in that district. The notification shall include all of the following:
- (1) the registration number of the registered engine or equipment unit;
 - (2) the name and phone number of the responsible official with information concerning the locations where the registered engine or equipment unit will be operated within the district;
 - (3) estimated time the registered engine(s) or equipment unit(s) will be located in the district; and
 - (4) calculations showing the estimation of actual emissions expected for the project.
- (e) Except as listed in section 2459(d) above, owners and operators of registered engines are not sUbject to notification requirements.
- (f) The Executive Officer shall make available via the Internet a list of approved notification methods for each district.
- (g) Failure to provide the required notifications within the timelines specified in this section shall be deemed a violation of this regUlation.

NOTE: Authority cited: Sections 39600,39601,41752,41753,41754,41755, 43013(b) and 43018, Health and Safety Code. Reference: Sections 41750,41751,41752, 41753, 41754, and 41755, Health and Safety Code.

§ 2460. Inspections and Testing.

- (a) In determining if a portable engine or equipment unit is eligible for registration, the Executive Officer may inspect the portable engine or equipment unit and/or require a source test, at the owner's expense.
- (b) Each district shall inspect all registered engines and equipment units for which the district has been **designated** as the home district pursuant to section 2453(i) *above*, as specified below:
 - (1) Within 45 days after the date of initial issuance or renewal of a registration, the owner or **operator** shall contact the home district to arrange for inspection of the registered engine or equipment unit to be completed within one year of the initial registration or renewal date. If the registered engine or equipment unit shall be operating in a district, other than the home district, the owner or operator may request the home district to arrange for an inspection by that other district.
 - (2) For portable engines, each home district should conduct no more than 20 percent of the arranged inspections for that district as in-field inspections. All arranged inspections not conducted as in-field inspections shall be conducted as non-field inspections. If a portable engine is found in violation during an in-field inspection, the next arranged inspection for that engine shall be an in-field inspection. This section does not limit the authority of a district to conduct any number of non-arranged in-field or non-field inspections for which no fee is charged.
 - (3) For registered equipment units operating with registered engines, the owner or operator may not request that the registered engine be inspected at the hourly rate specified in Table 3 for equipment unit inspections. Inspection fees for registered engines are to be paid as listed in item 14 in Table 3.
 - (4) Arranged inspections for PEPS engines and registered equipment units shall be non-field inspections unless an in-field inspection is requested by the holder of the registration and a reasonable in-field inspection location is arranged with the appropriate district.
 - (5) The time for an arranged inspection shall be agreed upon in *advance* with the district and company preferences regarding time of day shall be accommodated within reason. To the extent that an arranged inspection does not fall within the district's normal workday, the district may charge for the off-hour time based on a fee as specified in Table 3.
 - (6) If an arranged inspection of a registered engine or registered equipment unit does not occur due to unforeseen circumstances, the owner or operator and the home district shall reschedule the arranged inspection no later than 90 days of the initially scheduled inspection. Any unreasonable actions on the part of the owner or operator that *prevents* the inspection to

occur within the specified time frame shall be deemed a violation of this article. Actions taken by the owner or operator that could be deemed "unreasonable" include, but are **not** limited to:

- (A) failing to respond to the district correspondences or other contracts made to schedule the inspection;
 - (B) failing to ensure that the registered engine or equipment unit is in operation for arranged "in-field inspections" or where the district has provided advance notification to the owner or operator **that** the registered engine or equipment unit is required to be observed in operation.
- (7) The owner or operator may request the scheduling of one or more arranged inspections for multiple engines in order to qualify for an inspection fee discount as specified in section 2461 (d). Within 45 days of date of initial issuance of registration or by January 30 of each year for renewals, the owner or operator shall submit a letter of intent including an equipment list and registration numbers to the district to arrange for inspection of multiple engines. The inspections shall be completed within one year after the registration renewal date for each engine inspected.
- (8) If a registered engine or equipment unit is out of California for one year or more following initial registration or renewal, the engine or equipment unit shall be excused from having the arranged inspection within that period if:
- (A) within 45 days after the date of initial issuance or renewal of the registration, the owner or operator submitted a letter to the district noting the registration number of the registered engine or equipment unit and that the engine or unit is out of California for the one-year period; and
 - (B) upon the return of the registered engine or equipment unit to the State, the owner or operator shall arrange to have the registered engine or equipment unit inspected within 30 days.
- (c) After issuance of registration, the Executive Officer or district may at any time conduct an inspection of any registered engine or equipment unit in order to verify compliance with the requirements of this article. The district shall not charge the owner or operator an additional inspection fee for that inspection. Source testing of engines for compliance purposes shall not be required more frequently than once every three years (including testing at the time of registration), except as provided in section 2460 (e), unless evidence of engine tampering, lack of proper engine maintenance, or other problems or operating conditions that could affect engine emissions are identified. In no event shall the Executive Officer or district require source testing of a registered engine for which there is no applicable emission standard, emission limit or other emission related requirement contained in this regulation.

- (d) Testing shall be conducted in accordance with the following methods or other methods approved by the Executive Officer:

Particulate Matter:	ARB Test Method 5 with probe catch and filter catch only
VOC:	ARB Test Method 100 or U.S. EPA Test Method 25A
NOx:	ARB Test Method 100 or U.S. EPA Test Method 7E
Carbon Monoxide:	ARB Test Method 100 or U.S. EPA Test Method 10
Oxygen: .	ARB Test Method 100 or U.S. EPA Test Method 3A
Gas Velocity and Flow Rate:	ARB Test Method 1 & 2 or U.S. EPA Test Method 1 & 2

- (e) Initial or follow-up source testing of engines to verify compliance with the requirements of this regulation shall not be required for certified compression-ignition engines and spark-ignition engines.
- (f) The exemption provided in section 2460 (e) shall not apply to source testing of engines for compliance purposes where evidence of engine tampering, lack of proper engine maintenance, or other problems or operating conditions that could affect engine emissions are identified.

NOTE: Authority cited: Sections 39600,39601,41752,41753,41754,41755, 43013(b) and 43018, Health and Safety Code. Reference: Sections 41750,41751,41752,41753, 41754, and 41755, Health and Safety Code.

§ 2461. Fees.

- (a) Except as otherwise set out herein, the Executive Officer shall assess and collect reasonable fees for registration, renewal, and associated administrative tasks, to recover the estimated costs to the Executive Officer for evaluating registration applications, and issuing registration documentation . .
- (b) Fees shall be due and payable to the Executive Officer at the time an application is filed or as part of any request requiring a fee. Fees are nonrefundable except in circumstances as determined by the Executive Officer.
- (c) Except as provided in (k) below, the owner or operator of a registered engine or equipment unit shall submit fees to the Executive Officer and to districts in accordance with Table 3.
- (d) The Executive Officer shall collect an inspection fee as listed in Table 3 one time per every three calendar years for each registered engine to be paid upon initial application **and** renewal. Except for TSE, when multiple registered engines are inspected at a given source or location, the owner shall receive a discount if the owner or operator intends to arrange multiple engines inspections with the district and complies with the requirements specified in section 2460(b)(7). The discounts shall be applied as follows:
- (1) no discount for 1 to 3 engines
 - (2) 25 percent discount for 4 to 9 engines
 - (3) 35 percent discount for 10 or more engines

- (e) Failure to pay renewal fees when due may result in penalties. If a fee payment is not received or postmarked by the specified due date, fee penalties may be assessed per unit in accordance with Table 3. Failure to pay renewal fees prior to expiration may result in cancellation of the registration. If a registration has expired for an engine or equipment unit that is eligible for reactivation, a canceled registration may be reactivated after payment of all renewal and penalty fees. Registration may be reissued under the original registration number and expiration date. A portable engine or equipment unit without valid registration is subject to the rules and regulations of the district in which it operates.
- (f) Fees shall be periodically revised by the Executive Officer in accordance with the consumer price index, as published by the United States Bureau of Labor Statistics.
- (g) A district may collect a fee for the inspection of a registered equipment unit pursuant to section 2460(b)(3). The district shall bill the owner of the equipment unit at a rate as specified in Table 3 of the regulation for actual staff time ~~taken~~ to perform the inspection, not to exceed the amount specified in Table 3. Upon receipt of the invoice for the inspection fee, the owner shall have the right to appeal the district's fee determination to the district Air Pollution Control Officer pursuant to the provisions of the district's rules and regulations that govern appeals of fee determinations.
- (h) The Executive Officer shall annually distribute district inspection fees collected for that year. General inspection fees will be distributed equally among the districts. Home district inspection fees will be distributed to the corresponding home district.
- (i) TSE fees are due at the time of the report pursuant to section 2458(c). Failure to submit the annual report and applicable fees within six calendar months after the end of the year will result in cancellation of the registration. For TSE, if registration is cancelled or allowed to expire, the applicant shall reapply and pay initial registration fees.

The district may collect an inspection fee as listed in Table 3 one time per calendar year for each registered TSE inspected. When multiple registered TSE units are inspected at a given source or location, the inspection fee shall be equal to the lesser of the actual cost, including staff time, for conducting the inspection or the fee as listed in Table 3 per registered portable engine or equipment unit inspected. If the district performs an inspection leading to determination of non-compliance with this article, or any applicable state or federal requirements, the district may charge a fee as listed in Table 3 per portable engine or equipment unit for each inspection necessary for the determination and ultimate resolution of the violation. In no event shall the total fees exceed the actual costs, including staff time, to the district of conducting the investigations and resolving any violations.

(k) Portable engines qualifying for initial registration as resident engines per section 2452(Umm)(2) shall use the Table 2 fee schedule. The fees collected subject to this section shall be distributed to the districts, except that \$270 dollars per engine for initial registration, and an additional \$80 dollars per engine shall be retained by the Air Resources Board to provide for administrative costs. The fees shall be determined as follows:

- (1) For tier 1 engines, as defined in section 2452(uww), registration fees will be based on the year listed in Table 2, as determined below:
 - (A) Where date of purchase can be verified by the Executive Officer, the earlier of:
 - (1) for engines ≥ 50 bhp and < 100 bhp: year of purchase or 2004;
 - (2) for engines ≥ 100 bhp and < 300 bhp: year of purchase or 2003;
 - (3) for engines ≥ 300 bhp and < 600 bhp: year of purchase or 2001;
 - (4) for engines ≥ 600 bhp and ≤ 750 bhp: year of purchase or 2002;
 - (5) for engines > 750 bhp: year of purchase or 2006.
 - (B) Where the date of purchase can not be verified, the model year shall be used.
- (2) For tier 2 engines, as defined in section 2452(wxx), registration fees as listed in Table 2 will be based on the year the engine was purchased (as verified by the Executive Officer) or the model year of the engine (if purchase date is not available).

Table 2 Registration Fees For Resident Engines Per Section 2452(##mm)(2)

<i>Portable Engine Date*</i>	<i>Application Submitted on or Before 12/31/07</i>	<i>Application Submitted in 2008</i>	<i>Application Submitted in 2009</i>
1996	\$2,353	\$3,130	\$5,000
1997	\$2,195	\$2,920	\$4,685
1998	\$2,038	\$2,710	\$4,370
1999	\$1,880	\$2,500	\$4,055
2000	\$1,723	\$2,290	\$3,740
2001	\$1,565	\$2,080	\$3,425
2002	\$1,408	\$1,870	\$3,110
2003	\$1,250	\$1,660	\$2,795
2004	\$1,093	\$1,450	\$2,480
2005	\$935	\$1,240	\$2,165
2006	\$778	\$1,030	\$1,850

*As determined in section 2461 (k)

Table 3 Fees for Statewide Registration Program
(Fees are per registered unit except where noted otherwise)

1	Initial Registration	\$270.00
2	TSE, initial registration	
A	Reoistration of first 25 units (or portion thereof)	\$750.00
B	Reoistration of every additional 50 units (or portion thereof)	\$750.00
3	Change of status from non-operational to operational	
A	Where initial evaluation has not been previously completed	\$180.00
B	Where initial evaluation has been previously completed	\$90.00
4	Identical replacement	\$75.00
5	Renewal, non-TSE	\$225.00
6	Penalty fee for late renewal payments, non-TSE	
A	Postmarked within 2 calendar months prior to registration expiration date	\$45.00
B	Postmarked within the calendar month prior to reoistration expiration date	\$90.00
C	Postmarked after the reoistration expiration date	\$250.00
7	Annual TSE inventory fee	
A	first 25 units (or portion thereof)	\$375.00
B	every additional 50 units (or portion thereof)	\$375.00
8	Modification to registered portable engine or equipment unit	\$75.00
9	Change of ownership	\$75.00
10	Replacement of registration identification device or placard	\$30.00
11	Correction to an engine or equipment unit description-	\$45.00
12	Update company information, copy of registration documents	\$45.00
13	Copy of registration documents	\$45.00
14	Total district inspection fee per registered portable engine, paid once every 3 years	\$345.00
A	General district inspection fee	\$30.00
B	Home district inspection fee	\$315.00
15	District off-hour service fee per hour	\$50.00
16	District inspection fees for equipment units:	
A	General district inspection fee, paid once every 3 years	\$75.00
B	District inspection fee per equipment unit, per hour	\$98.00 (not to exceed \$500.00)
17	TSE inspection fees:	
A	General district inspection fee per TSE unit, paid annually	\$10.00
B	District inspection fee per TSE unit per inspection	\$75.00
18	Placard	\$5.00

NOTE: Authority cited: Sections 39600,39601,41752,41753,41754,41755, 43013(b) and 43018, Health and Safety Code. Reference: Sections 41750,41751,41752,41753,41754, and 41755, Health and Safety Code.

§ 2462. Duration of registration.

- (a) Except for registrations that will expire on December 31, 2009 pursuant to sections 2456(4f)(10) and 17 CCR 93116.3(b)(1)(A), registrations and renewals will be valid for three years from date of issuance. For change of ownership, the registration shall retain the original expiration date, except where the registration has expired.
- (b) The Executive Officer shall mail to the owner of a registered engine or equipment unit a renewal invoice at least 60 days prior to the registration expiration. Failure to send or receive a renewal invoice does not relieve the responsible official from paying all applicable fees when due.

NOTE: Authority cited: Sections 39600,39601,41752,41753,41754,41755, 43013(b) and 43018, Health and Safety Code. Reference: Sections 41750, 41751, 41752, 41753, 41754, and 41755, Health and Safety Code.

§ 2463. Suspension or Revocation of Registration.

- (a) The Executive Officer for just cause may suspend or revoke registration in any of the following circumstances:
 - (1) the holder of registration has violated one or more terms and conditions of registration or has refused to comply with any of the requirements of this article;
 - (2) the holder of registration has materially misrepresented the meaning, findings, effect or any other material aspect of the registration application, including submitting false or incomplete information in its application for registration regardless of the holder's personal knowledge of the falsity or incompleteness of the information;
 - (3) the test data submitted by the holder of registration to show compliance with this regulation have been found to be inaccurate or invalid;
 - (4) enforcement officers of the ARB or the districts, after presentation of proper credentials, have been denied access, during normal business hours or hours of operation, to any facility or location where registered engines and equipment units are operated or stored and are prevented from inspecting such engines or equipment units as provided for in this article (the duty to provide access applies whether or not the holder of registration owns or controls the facility or location in question);
 - (5) enforcement officers of the ARB or the districts, after presentation of proper credentials, have been denied access to any records required by this regulation for the purpose of inspection and duplication;

- (6) the registered engine or equipment unit has failed in-use to comply with the findings set forth in the registration. For the purposes of this section, noncompliance with the registration may include, but is not limited to:
 - (A) a repeated failure to perform to the standards set forth in this article; or
 - (B) modification of the engine or equipment unit that results in an increase in emissions or changes the efficiency or operating conditions of such engine or equipment unit, without prior notice to and approval by the Executive Officer; or
 - (7) the holder of registration has failed to take requested corrective action as set forth in a Notice of Violation or Notice to Comply within the time period set forth in such notice or as otherwise specified in writing by the issuing district.
 - (8) the holder of the registration has failed to pay fees assessed by either the Executive Officer or district within 120 after the specified due date and there is no pending appeal.
- (b) A holder of registration may be Subject to a suspension or revocation action pursuant to this section based upon the actions of an agent, employee, licensee, or other authorized representative.
 - (c) The Executive Officer shall notify each holder of registration by certified mail of any action taken by the Executive Officer to suspend or revoke any registration granted under this article. The notice shall set forth the reasons for and evidence supporting the action(s) taken. A suspension or revocation is effective upon receipt of the notification.
 - (d) A holder of registration having received a notice to revoke or suspend registration may request that the action be stayed pending a hearing under section 2464. In determining whether to grant the stay, the Executive Officer shall consider the reasonable likelihood that the registration holder will prevail on the merits of the appeal and the harm the holder of registration will likely suffer if the stay is not granted. The Executive Officer shall deny the stay if the adverse effects of the stay on the public health, safety, and welfare outweigh the harm to the holder of registration if the stay is not granted.
 - (e) Once a registration has been suspended pursuant to (a) above, the holder of registration shall satisfy and correct all noted reasons for the suspension and submit a written report to the Executive Officer advising him or her of all such steps taken by the holder before the Executive Officer will consider reinstating the registration.
 - (f) After the Executive Officer suspends or revokes a registration pursuant to this section and prior to commencement of a hearing under section 2464, if the holder of registration demonstrates to the Executive Officer's satisfaction that the decision to suspend or revoke the registration was based on erroneous information, the Executive Officer will reinstate the registration.

- (g) Nothing in this section shall prohibit the Executive Officer from taking any other action provided for by law for violations of the Health and Safety Code.

NOTE: Authority cited: Sections 39600,39601,41752,41753,41754,41755, 43013(b) and 43018, Health and Safety Code. Reference: Sections 41750,41751,41752,41753,41754, and 41755, Health and Safety Code.

§ 2464. Appeals.

(a) Hearing Procedures.

- (1) Any applicant for registration whose application has been denied or a holder of registration **whose** registration has been, suspended, or revoked may request a hearing to review the action taken by sending a request in writing to the Executive Officer. A request for hearing shall include, at a minimum, the following:
- (A) name of applicant or holder of registration;
 - (B) registration number;
 - (C) copy of the Executive Order revoking or suspending registration or the written notification of denial;
 - (D) a concise statement of the issues to be raised, with supporting facts, setting forth the basis for challenging the denial, suspension, or revocation (mere conclusory allegations will not suffice);
 - (E) a brief summary of evidence in support of the statement of facts required in (D) above; and
 - (F) **the** signature of an authorized person requesting the hearing.
- (2) A request for a hearing shall be filed within 20 days from the date of issuance of the notice of the denial, suspension, or revocation.
- (3) A hearing requested pursuant to this section shall be heard by a qualified and impartial hearing officer appointed by the Executive Officer. The hearing officer may be an employee of the ARB, but may not be any employee who was involved with the registration at issue. In a request for a hearing of a denial of registration, after reviewing the request for a hearing and supporting documentation provided **under** subsection (1) above, the hearing officer shall grant the request for a hearing if he or she finds that the request raises a genuine and substantial question of law or fact.
- (4) Except as provided in (3) above, the hearing officer shall schedule and hold, as soon as practicable, a hearing at a time and place determined by the hearing officer.
- (5) Upon appointment, the hearing officer shall establish a hearing file. The file shall consist of the following:

- (A) the determination issued by the Executive Officer which is the subject of the request for hearing;
 - (B) the request for hearing and the supporting documents that are submitted with it;
 - (C) all documents relating to and relied upon in making the determination to deny registration or to suspend or revoke registration; and
 - (D) correspondence and other documents material to the hearing.
- (6) The hearing file shall be available for inspection by the applicant at the office of the hearing officer.
 - (7) An applicant may appear in person or may be represented by counsel or by any other duly-authorized representative.
 - (8) The ARB may be represented by staff or counsel familiar with the registration program and may present rebuttal evidence.
 - (9) Technical rules of evidence shall not apply to the hearing, except that relevant evidence may be admitted and given probative effect only if it is the kind of evidence upon which reasonable persons are accustomed to relying in the conduct of serious affairs. No action shall be overturned based solely on hearsay evidence, unless the hearsay evidence would be admissible in a court of law under a legally recognized exception to the hearsay rule.
 - (10) The hearing shall be recorded either electronically or by a certified shorthand reporter.
 - (11) The hearing officer shall consider the totality of the circumstances of the denial, suspension, or revocation, including but not limited to the credibility of witnesses, authenticity and reliability of documents, and qualifications of experts. The hearing officer may also consider relevant past conduct of the applicant including any prior incidents involving other ARB programs.
 - (12) The hearing officer's written decision shall set forth findings of fact and conclusions of law as necessary.
 - (13) Within 30 days of the conclusion of a hearing, the hearing officer shall submit a written proposed decision, including proposed finding as well as a copy of any material submitted by the hearing participants as part of that hearing and relied on by the hearing officer, to the Executive Officer. The hearing officer may recommend to the Executive Officer any of the following:
 - (A) uphold the denial, suspension, or revocation action as issued;
 - (B) reduce a revocation to a suspension;
 - (C) increase a suspension to a revocation if the registration holder's conduct so warrants; or
 - (D) overturn a denial, suspension, or revocation in its entirety.
 - (14) The Executive Officer shall render a final written decision within 60 working days of the last day of hearing. The Executive Officer may do any of the following:

- (A) adopt the hearing officer's proposed decision;
 - (B) modify the hearing officer's proposed decision; or
 - (C) render a decision without regard to the hearing officer's proposed decision.
- (b) Hearing conducted by written submission.
- (1) In lieu of the hearing procedure set forth in (a) above, an applicant may request that the hearing be conducted solely by written submission.
 - (2) In such case the requestor must submit a written explanation of the basis for the appeal and provide supporting documents within 20 days of making the request. Subsequent to such a submission the following shall transpire:
 - (A) ARB staff shall submit a written response to the requestor's submission and documents in support of the Executive Officer's action no later than 10 days after receipt of requestor's submission;
 - (B) The registration holder may submit one rebuttal statement which may include supporting information, as attachment(s), but limited to the issues previously raised;
 - (C) If the registration holder submits a rebuttal, ARB staff may submit one rebuttal statement which may include supporting information, as attachment(s), but limited to the issues previously raised; and
 - (D) the hearing officer shall be designated in the same manner as set forth in (a)(3) above. The hearing officer shall receive all statements and documents and submit a proposed written decision and such other documents as described in (a) 13 above to the Executive Officer no later than 30 working days after the final deadline for submission of papers. The Executive Officer's final decision shall be mailed to the holder of registration no later than 60 days after the final deadline for submission of papers.
 - (E) The Executive Officer shall render a final written decision within 60 working days of the last day of hearing. The Executive Officer may do any of the following:
 - (1) adopt the hearing officer's proposed decision;
 - (2) modify the hearing officer's proposed decision; or
 - (3) render a decision without regard to the hearing officer's proposed decision.

NOTE: Authority cited: Sections 39600, 39601, 41752, 41753, 41754, 41755, 43013(b) and 43018, Health and Safety Code. Reference: Sections 41750, 41751, 41752, 41753, 41754, and 41755, Health and Safety Code.

§ 2465. Penalties.

Violation of the provisions of this article may result in civil, and/or criminal penalties pursuant to the California Health and Safety Code. Each day during any portion of which a violation occurs is a **separate** violation.

NOTE: Authority cited: Sections 39600,39601,41752,41753,41754,41755, 43013(b) and 43018, Health and Safety Code. Reference: Sections 41750,41751,41752,41753,41754, and 41755, Health and Safety Code.

PROPOSED REGULATION ORDER

AIRBORNE TOXIC CONTROL MEASURE FOR DIESEL PARTICULATE MATTER
FROM PORTABLE ENGINES RATED AT 50 HORSEPOWER AND GREATER

Note: Proposed amendments are shown in underline to indicate additions and strikeout to indicate deletions, compared to the preexisting regulatory language.

Amend section 93116, title 13, California Code of Regulations to read as follows.

§ 93116 Purpose.

§ 93116.1 Applicability.

- (a) Except as provided below, all portable engines having a maximum rated horsepower of 50 bhp and greater and fueled with diesel are subject to this regulation.
- (b) The following portable engines are not subject to this regulation:
 - (1) Any engine used to propel mobile equipment or a motor vehicle of any kind;
 - (2) Any portable engine using an alternative fuel;
 - (3) Dual-fuel diesel pilot engines that use an alternative fuel or an alternative diesel fuel;
 - (4) Tactical support equipment;
 - (5) Portable diesel-fueled engines operated on either San Clemente or San Nicolas Island;
 - (6) Engines preempted from State regulation under 42 USC §7543(e)(1);
~~and~~
 - (7) Portable diesel-fueled engines operated at airports that satisfy the following requirements:
 - (A) the equipment is subject to the South Coast Ground Service Equipment Memorandum of Understanding (MOU); and
 - (8) the participating airlines have demonstrated to the satisfaction of the Executive Officer that the diesel PM reductions achieved by

satisfying the requirements of the MOU are equivalent to the reductions achieved by this control measure.

- (8) Engines used exclusively on cranes **shall** meet all applicable requirements in Title 13 of the California Code of Regulations commencing with section 2449;
- (9) Engines used exclusively on street sweepers that are not subject to Title 13 CCR section 2022 shall meet all applicable requirements in Title 13 of the California Code of Regulations commencing with section 2025.

Authority cited: Sections 39600, 39601, 39650, 39658, 39659, 39666, 41752, 43013 and 43018 Health and Safety Code. Reference: Sections 39650, 39666, 41752 Health and Safety Code.

§ 93116.2 Definitions.

(a) For the purposes of these regulations, the following definitions apply:

- (1) "*Air Pollution Control Officer or APCO*" means the air pollution control officer of a district, or his/her designee.
- (2) "*Alternative Fuel*" means gasoline, natural gas, propane, liquid petroleum gas (LPG), hydrogen, ethanol, or methanol.
- (3) "*Alternative Diesel Fuel*" means any fuel used in a compression ignition (CI) engine that is not, commonly or commercially known, sold or represented by the supplier as diesel fuel No. 1-0 or No. 2-D, pursuant to the specifications in ASTM Standard Specification for Diesel Fuel Oils 0975-81, or an alternative fuel, and does not require engine or fuel system modifications for the engine to operate, although minor modifications (e.g., recalibration of the engine fuel control) may enhance performance. An emission control strategy using a fuel additive will be treated as an alternative diesel fuel based **strategy** unless:
 - (A) the additive is supplied to the engine fuel by an on-board dosing mechanism, or
 - (B) the additive is directly mixed into the base fuel inside the fuel tank of the engine, or
 - (C) the additive and base fuel are not mixed until engine fueling commences, and no more additive plus base fuel combination is mixed than required for a single fueling of a single engine.
- (4) "*CARB Diesel Fuel*" means any diesel fuel that is commonly or commercially known, sold, or represented by the supplier as diesel fuel No: 1-0 or No. 2-D,

pursuant to the specification for Diesel Fuel Oils D975-81, and that meets the specifications defined in Title 13 CCR, sections 2281, 2282, and 2284.

- (5) "*Certified Nonroad Engine*" refers to an engine meeting an applicable nonroad engine emission **standard** as set forth in Title 13 of the California Code of Regulations or CFR 40 Part 89.
- (6) "*Crane*" means the same as "Two-Engine Crane" defined in Title 13, CCR, section 2449(c)(56)
- ~~(67)~~ "*Diesel Fuel*" means any fuel that is commonly or commercially known, sold, or represented by the supplier as diesel fuel, including any mixture of primarily liquid hydrocarbons-organic compounds consisting exclusively of the elements carbon and hydrogen-that is sold or represented as suitable for use in an engine.
- ~~(78)~~ "*Diesel-Fueled*" means fueled by diesel fuel, or CARB diesel fuel, in whole or part.
- ~~(89)~~ "*Diesel Particulate Matter (PM)*" means the particles found in the exhaust of diesel-fueled engines which may agglomerate and adsorb other species to form structures of complex physical and chemical properties.
- ~~(910)~~ "*District*" means a District as defined in Health and Safety Code section 39025.
- ~~(1011)~~ "*Dual-fuel Diesel Pilot Engine*" means a dual-fueled engine that uses diesel fuel as a pilot ignition source at an annual average ratio of less than 5 parts diesel fuel to 100 parts total fuel on an energy equivalent basis.
- ~~(112)~~ "*Emergency*" means providing electrical power or mechanical work during any of the following events and subject to the following conditions:
- (A) the failure or loss of all or part of normal electrical power service or normal natural gas supply to the facility:
1. which is caused by any reason other than the enforcement of a contractual obligation the owner or operator has with a third party or any other party; and
 2. which is demonstrated by the owner or operator to the district APCO's satisfaction to have been beyond the reasonable control of the owner or operator;
- (B) the failure of a facility's internal power distribution system:

1. which is caused by any reason other than the enforcement of a contractuar obligation the owner or operator has with a third party or any other party; and
 2. which is demonstrated by the owner or operator to the district APCO's satisfaction to have been beyond the reasonable control of the owner or **operator**; -
- (C) the pumping of water or **sewage** to prevent or mitigate a flood or sewage overflow;
- (D) the pumping of water for fire suppression or protection;
- (E) the pumping of water to maintain pressure in the water distribution system for the following reasons:
1. pipe break; or
 2. high demand on water supply system due to high use of water for fire suppression;
- (F) the breakdown of electric-powered pumping equipment at sewage treatment facilities or water delivery facilities;
- (G) the training of personnel in the use of portable equipment for emergency purposes.

(~~42~~13) "*Emergency Event*" refers to a situation arising from a sudden and reasonably unforeseen natural disaster such as an earthquake, flood, fire, or other acts of God, or other unforeseen event that requires the use of portable engines to help alleviate the threat to public health and safety.

(~~43~~14) "*Engine*" means any piston-driven internal combustion engine.

(~~44~~15) "*Engines Used Exclusively in Emergency Applications*" refer to engines that are used only during an emergency or emergency event, and includes appropriate maintenance and testing.

(~~45~~16) "*Executive Officer*" means the Executive Officer of the California Air Resources Board (CARB) or his/her designee.

(~~46~~17) "*Fleet*" refers to a portable engine or group of portable engines that are owned and managed by an individual operational entity, such as a business, business unit within a corporation, or individual city or state department under the control of a Responsible Official. Engines that are owned by different business entities that are under the common control of only one Responsible Official shall be treated as a single fleet.

(~~47~~18) "*Fuel Additive*" means any substance designed to be added to fuel or fuel systems or other engine-related systems such that it is present in-cylinder during combustion and has any of the following effects: decreased emissions, improved fuel economy, increased performance of the engine; or assists diesel emission control strategies in decreasing emissions, or improving fuel economy or increasing performance of the engine. Fuel additives used in conjunction with diesel fuel may be treated as an alternative diesel fuel.

(~~48~~19) "*In-Use Engines*" refers to portable diesel-fueled engines operating under valid permits or registrations as of December 31, 2005.

(~~49~~20) "*Level-3 Verified Technology*" means a technology that has satisfied the requirements of the "Verification Procedure for In-Use Strategies to Control Emissions from Diesel Engines" in Title 13, California Code of Regulations, commencing with section 2700, and has demonstrated an reduction in diesel particulate matter of 85% or greater.

(~~20~~21) "*Location*" means any single site at a building, structure, facility, or installation.

(~~24~~22) "*Low-Use Engines*" refers to portable diesel-fueled engines that operate 80 hours or less in a calendar year.

(~~22~~23) "*Maximum Rated Horsepower (brake horsepower (bhp))*" is the maximum brake horsepower rating specified by the portable engine manufacturer and listed on the nameplate of the portable engine.

(~~23~~24) "*Nonroad Engine*" means:

- (A) Except as discussed in paragraph (2) of this definition, a nonroad engine is any engine:
1. in or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as ~~garden~~ tractors, off-highway mobile cranes and bulldozers); or
 2. in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers); or
 3. that, by itself or in or on a piece of equipment, is portable or transportable, meaning designed, to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.

- (B) An engine is not a nonroad engine if:
1. the engine is used to propel a motor vehicle or a vehicle used solely for competition, or is subject to standards promulgated under section 202 of the federal Clean Air Act; or
 2. ~~the~~ engine is regulated by a federal New Source Performance Standard promulgated under section 111 of the federal Clean Air Act; or
 3. the engine otherwise included in paragraph (1)(C) of this definition remains or will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. Any engine(s) that replace(s) an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period. An engine located at a seasonal source is an engine that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (at least two years) and that operates at that single location approximately three (or more) months each year.

~~(2425)~~ "Off-Road Engine" means the same as *nonroad* engine.

~~(2526)~~ "Outer Continental Shelf (OCS)" shall have the meaning provided by section 2 of the Outer Continental Shelf Lands Act (43 USC Section 1331 et seq.).

~~(2627)~~ "Participating Airlines" means the collective group of Individual Participating Airlines under the MOU, which currently is as follows: ABX Air, Inc. (formerly Airborne Express), Alaska Airlines, America West Airlines, American Airlines, ATA Airlines (formerly American Trans Air), Continental Airlines, Delta Air Lines, Astar Air Cargo (formerly DHL Airways), Federal Express, Hawaiian Airlines, Jet Blue Airways Corp., Midwest Airlines (formerly Midwest Express Airlines), Northwest Airlines, Southwest Airlines, United Airlines, United Parcel Service, and US Airways. Participating Airlines does not mean the Air Transportation Association of America, Inc.

~~(2728)~~ "Permit" refers to a certificate issued by the Air Pollution Control Officer acknowledging expected compliance with the applicable requirements of the district's rules and regulations.

~~(2829)~~ "Portable" means designed and capable of being carried or moved from one location to another. Indicia of portability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform. For the purposes of this regulation, dredge engines on a boat or barge are considered portable. The engine is not portable if:

- (A) the engine or its replacement is attached to a foundation, or if not so attached, will reside at the same location for more than 12 consecutive months. The period during **which** the engine is maintained at a storage facility shall be excluded from the residency time determination: Any engine, such as a back-up or stand-by engine, that replace engine(s) at a location, and is intended to perform the same or similar function as the engine(s) being replaced, will be included in calculating the consecutive time period. In that case, the cumulative time of all engine(s), including the time between the removal of the original engine(s) and installation of the replacement engine(s), will be counted toward the consecutive time period; or
- (B) the engine remains or will reside at a location for less than 12 consecutive months if the engine is located at a seasonal source and operates during the full annual operating period of the seasonal source, where a seasonal source is a stationary source that remains in a single location on a permanent basis (at least two years) and that operates at that single location at least three months each year; or
- (C) the engine is moved from one location to another in an attempt to circumvent the portable residence time requirements.

~~(2930)~~ "*Project*" means the use of one or more registered *or* permitted portable engines or equipment units operated under the same or common ownership or control to perform a single activity.

~~(3031)~~ "*Registration*" refers to either:

- (A) a certificate issued by the Executive Officer acknowledging expected compliance with the applicable requirements of the Statewide Portable Equipment Registration Program; or
- (B) a certificate issued by the Air Pollution Control Officer acknowledging expected compliance with the applicable requirements of the district's Portable Equipment Registration Program.

~~(3132)~~ "*Responsible Official*" refers to an individual employed by the company or public agency with the authority to certify that the portable engines under his/her jurisdiction comply with applicable requirements of this regulation. A company or public agency may have more than one Responsible Official.

~~(3233)~~ "*Selective Catalytic Reduction (SCR) System*" refers to an air pollution emissions control system that reduces oxides of nitrogen (NOx) emissions through the catalytic reduction of NOx by injecting nitrogen-containing compounds into the exhaust stream, such as ammonia or urea.

~~(3334)~~ "*Stationary Source*" means any building, structure, facility or installation that emits any air contaminant directly or as a fugitive emission. Building, structure, facility, or installation includes all pollutant emitting activities which:

- (A) are under the same ownership or operation, or which are owned or operated by entities which are under common control; and
- (B) belong to the same industrial grouping either by virtue of falling within the same two-digit standard industrial classification code or by virtue of being part of a common industrial process, manufacturing process, or connected process involving a common raw material; and
- (C) are located on one or more contiguous or adjacent properties.

[Note: For the purposes of this regulation a stationary source and nonroad engine are mutually exclusive.]

~~(3435)~~ *"Stock Engine"* means a certified diesel-fueled engine that has never been placed in service and is part of a supply of engines offered for sale, rent, or lease by a person or company who offers for sale, rent, or lease engines and related equipment for profit.

~~(3536)~~ *"Storage"* means a warehouse, enclosed yard, or other area established for the primary purpose of maintaining portable engines when not in operation.

(37) *"Street Sweeper"* means the same as "Dual-engine Street Sweeper" defined in Title 13. CCR, section 2022(b)(2).

~~(3638)~~ *"Tactical Support Equipment (TSE)"* means equipment using a portable engine, including turbines, that meets military specifications, owned by the U.S. Department of Defense and/or the U.S. military services or its allies, and used in combat, combat support, combat service support, tactical or relief operations, or training for such operations. Examples include, but are not limited to, engines associated with portable generators, aircraft start carts, heaters and lighting carts.

~~(3739)~~ *"Tier 4 Emission Standards"* refers to the final emission standards adopted by the U.S. EPA for newly manufactured nonroad engines.

~~(3840)~~ *"Transportable"* means the same as portable.

~~(3941)~~ *"Verified Emission Control Strategy"* refers to an emission control strategy, designed primarily for the reduction of diesel PM emissions which has been verified pursuant to the "Verification Procedure for In-Use Strategies to Control Emissions from Diesel Engines" in Title 13, California Code of Regulations, commencing with section 2700, and incorporated by reference.

~~(4042)~~ *"U.S. EPA"* refers to the United States Environmental Protection Agency.

Authority cited: Sections 39600, 39601, 39650, 39658, 39659, 39666, 41752, 43013 and 43018 Health and Safety Code. Reference: Sections 39650, 39666, 41752 Health and Safety Code.

§ 93116.3 Requirements.

- (a) Diesel-fueled portable engines shall only use one of the following fuels:
- (1) CARB diesel fuel; or
 - (2) alternative diesel fuel that has been verified through the Verification Procedure for In-Use Strategies to Control Emissions from Diesel Engines; or
 - (3) CARB diesel fuel utilizing fuel additives that have been verified through the Verification Procedure for In-Use Strategies to Control Emissions from Diesel Engines.

[Note that credit for diesel PM reductions for diesel fuel or CARB diesel fuel blends that use an alternative diesel fuel such as biodiesel, Fischer-Tropsch fuels, or emulsions of water in diesel fuel is available only for fuel blends that been verified through the Verification Procedure for In-Use Strategies to Control Emissions from Diesel Engines. The credit granted is based upon the verified level approved by the Executive Officer within the Executive Order for the fuel blend.]

(b) Diesel PM Standards

- (1) Requirements for in-use portable diesel-fueled engines
 - (A) Except as provided in sections 93116.3(b)(1)(B) and ~~93116.3(b)(4)~~, starting January 1, 2010, all portable diesel-fueled engines shall be certified to meet a federal or California standard for newly manufactured nonroad engines pursuant to 40 CFR Part 89 or Title 13 of the California Code of Regulations (that is, certified to Tier 1, 2 or 3 nonroad engine standards).¹
 - (B) In lieu of complying with (b)(1)(A), owners of portable diesel-fueled engines used exclusively in emergency applications or portable diesel-fueled engines that qualify as low-use engines may commit to replacing these engines with Tier 4 engines, subject to the requirements below:

¹ Tier 1, 2, 3, and 4 refer to nonroad engine emission standards promulgated by ARB and U.S. EPA for newly manufactured engines pursuant to 40 CFR Part 89 or Title 13 of the California Code of Regulation. Each successive Tier represents more stringent emission standards and the requirements are phased-in over time with the Tier 1 engine standards becoming effective for some engines manufactured in 1996 and becoming effective for all engines by 2000. Tier 2 engine standards are phased in for engines manufactured beginning in 2001 and becomes effective for all engines by 2006. Similarly, Tier 3 engines are phased in for engines manufactured beginning in 2006, and Tier 4 engines are phased in for engines manufactured beginning in 2011.

1. the Responsible Official shall submit written notification identifying the specific portable diesel-fueled engines to be replaced with portable diesel-fueled engines certified to the Tier 4 emission standards; and
 2. for each class and category of nonroad engine, replace each portable diesel-fueled engine so identified within two years of the first engine being offered for sale that satisfies the Tier 4 emission standards.
- (2) Portable diesel-fueled engines that have not been permitted or registered prior to January 1, 2006, are subject to the following requirements:
- (A) except as specified in ~~93116.3(b)(45)~~, ~~93116.3(b)(56)~~, and ~~93116.3(b)(67)~~, and except as allowed under flexibility provisions for equipment and vehicle manufacturers and post-manufacture marinizers pursuant to 40 CFR Part 89 or Title 13 of the California Code of Regulations, the portable diesel-fueled engine shall meet the most stringent of the federal or California emission standard for nonroad engines; or
 - (B) upon approval by the air pollution control officer, a diesel-fueled portable engine not certified to an emission standard pursuant to 40 CFR Part 89 or Title 13 of the California Code of Regulations used exclusively in emergency applications or qualifying as a low-use engine designation may only be permitted or registered by a district. Any engine used exclusively in emergency applications or qualifying as a low-use engine designation is sUbject to the requirements of section 93116.3(b)(3).
- (3) Except as provided in section 93116.3(b)(1)(B), portable diesel-fueled engines used exclusively in emergency applications or qualifying as low-use engines shall satisfy one of the following requirements by January 1, 2020:
- (A) the portable diesel-fueled engine is certified to Tier 4 emission standards for newly manufactured nonroad engines; or
 - (B) the portable diesel-fueled engine is equipped with a properly functioning level-3 verified technology; or
 - (C) the portable diesel-fueled engine is equipped with a combination of verified emission control strategies that have been verified together to achieve at least 85% reduction in diesel PM emissions.

- (4) Lattice beam cranes
- (A) A portable diesel fueled engine used in a lattice beam crane shall be exempt from the requirements of section 93116.3(b)(1) ~~(A)~~ if the Responsible Official has demonstrated to the satisfaction of the Executive Officer or the APCO that the portable diesel fueled engine in the lattice beam crane cannot be replaced with a portable diesel fueled engine that is certified to meet a federal or California standard for newly manufactured nonroad engines pursuant to 40 CFR Part 89 or Title 13 of the California Code of Regulations (that is, certified to Tier 1, 2 or 3 nonroad engine standards).
 - (B) Portable diesel fueled engines exempt from the requirements of section 93116.3(b)(1) ~~(A)~~ pursuant to section 93116.3(b)(4)(A) shall satisfy one of the following requirements by January 1, 2020:
 1. the portable diesel fueled engine is certified to Tier 4 emission standards for newly manufactured nonroad engines; or
 2. the portable diesel fueled engine is equipped with a properly functioning level 3 verified technology; or
 3. the portable diesel fueled engine is equipped with a combination of verified emission control strategies that have been verified together to achieve at least 85% reduction in diesel PM emissions.
- ~~(45)~~ Engines operated in California between March 1, 2004 and October 1, 2006 may be permitted or registered by a district or registered in the Statewide Portable Equipment Registration Program until 12/31/09 if they meet an emission standard pursuant to 40 CFR Part 89 or Title 13 of the California Code of Regulations.
- (56) Upon approval by the air pollution control officer, a district may permit or register engines operated in California between March 1, 2004 and October 1, 2006 that are not certified to an emission standard pursuant to 40 CFR Part 89 or Title 13 of the California Code of Regulations.
- (67) An engine owner, operator, dealer, or distributor may permit or register an engine not meeting the most stringent emission standard providing the following are met:
- (A) The engine met the most stringent emission standard in effect prior to the change for that horsepower range; and
 - (B) The application for permit or registration of the engine is submitted within six months of the effective date of the change in emission standards.

(c) Fleet Requirements

- (1) Each fleet is **subject** to and shall comply with the following weighted PM emission fleet averages expressed as grams per brake horsepower-hour (g/bhp-hr) by the listed compliance dates:

<i>Fleet Standard Compliance Date</i>	<i>Engines <175 hp (g/bhp-hr)</i>	<i>Engines >175 to 749hp (g/bhp-hr)</i>	<i>Engines >750 hp (g/bhp-hr)</i>
1/1/13	0.3	0.15	0.25
1/1/17	0.18	0.08	0.08
1/1/20	0.04	0.02	0.02

- (2) For the purposes of this regulation, the portable diesel-fueled engines affected by the fleet provisions of this regulation include all portable diesel-fueled engines operated in California, **including** portable diesel-fueled engines registered with the Statewide Portable Equipment Registration Program or permitted by or registered with a district.
- (3) The following portable diesel-fueled engines shall be excluded **from** the fleet requirements:
- (A) portable diesel-fueled engines operated exclusively outside of California or operated only within the *DGS*.
 - (B) portable diesel-fueled engines used exclusively in emergency applications.
 - (G) portable diesel-fueled engines that qualify as low-use engines.
 - (D) portable diesel fueled engines used in a lattice boom Crane.
- (4) Portable diesel-fueled engines that qualify as low-use engines and subsequently exceed the allowed hours of operation in a calendar year, or portable diesel-fueled engines that are identified to be used exclusively in emergency applications but subsequently are used in non-emergency applications, become immediately subject to the requirements of section 93116.3(c) in the year such exceedence or use occurs. For low-use engines, **the** hours of operation used for an emergency event shall not be counted toward the allowed hours of operation.
- (5) Portable alternative-fueled engines may be included in a fleet if the engine satisfies the requirements in section 93116.3(d)(2)(B).

- (6) Portable diesel-fueled portable engines equipped with SCR systems.
- (A) The diesel PM fleet emission standards in section 93116.3(c)(1) do not apply to:
1. portable diesel-fueled engines equipped with properly operating SCR systems as of January 1, 2004; and
 2. with the approval of the Executive Officer, portable diesel-fueled engines equipped with properly operating SCR systems after January 1, 2004.
- (B) At the request of the Responsible Official, portable diesel-fueled engine(s) equipped with a SCR system(s) may be included in the company's fleet for the purpose of complying with an applicable fleet emission standard. Once the engine(s) is included in a fleet, compliance with applicable fleet emission standards shall always include these diesel-fueled portable engine(s).
- (C) For all diesel-fueled portable engines equipped with SCR systems, the following information shall be submitted to the Executive Officer to demonstrate that the SCR system is operating properly:
1. Tests results for NOx, PM, and ammonia slip
 - a. the following tests methods shall be used to demonstrate compliance:
 - i. NOx shall be measured with CARB test method 100 dated July 1997, or equivalent district-approved test method; and
 - ii. diesel PM shall be measured with CARB test method 5 dated July 1997 or equivalent district-approved test method. For the purposes of this requirement, only the probe catch and filter catch ("front half") is used to determine the emission rate, g/bhp-hr, and shall not include PM captured in the impinger catch or solvent extract; and
 - iii. ammonia slip shall be measured with Bay Area Air Quality Management District Source Test Procedure ST-1 B, Ammonia Integrated Sampling, dated January 1982, or other equivalent district approved test method.

- b. the duration of the emission test shall be sufficient to document the typical operation of the portable diesel-fueled engine(s); and
- c. testing shall be performed at the frequency required by the permit or registration. In no event shall the time between emission tests exceed three years.

(7) Beginning on January 1, 2013, the weighted average PM emission rate for the fleet cannot exceed the fleet standard that is in effect. Changes in the fleet, including portable engine additions and deletions, shall not result in noncompliance with this standard.

(d) Fleet Average Calculations

(1) General Provisions

(A) The average PM emission factor for the fleet is determined by the following formula:

$$\frac{\sum (\text{bhp} \times \text{emission factor})}{\sum \text{bhp}}$$

where:

bhp = maximum rated horsepower.

emission factor = diesel PM emission rate, as determined below:

- (B) The following diesel PM emission rates shall be used with the above formula to determine the weighted average fleet emission rate:
1. for portable diesel-fueled engines certified to a nonroad engine standard, the results of emission measurements submitted to either the U.S. EPA or CARB for the purposes of satisfying the appropriate emission standard; or
 2. results from emission measurements from a verified emission control strategy may be used in conjunction with engine emission information; or
 3. for portable diesel-fueled engine(s) equipped with SCR system(s), results from valid emission tests.

- (2) The following incentives may be used to revise the fleet average, as outlined below:
- (A) Where equipment uses grid power for more than 200 hours in lieu of operating a portable diesel-fueled engine for a given project, the time period grid power is used may be used to reduce each affected engine's emission factor. The emission factor for each affected portable engine will be reduced proportionally by the percentage of time the equipment uses grid power. To receive credit for grid power in the fleet calculation, the recordkeeping and reporting requirements in section 93116.4(c)(3) shall be satisfied.
 - (B) Alternative-fueled portable engines
 1. Alternative-fueled portable engines operating 100 or more hours may be included toward determining compliance with the applicable fleet emission standards. A diesel PM emission rate of zero shall be used in the fleet calculations for these engines.
 2. Alternative-fueled portable engines operating 100 or more hours per calendar year and added to a fleet prior to January 1, 2009, may be counted twice in the company's fleet average determination toward compliance with the 2013 and 2017 fleet emission standards. The alternative-fueled engine shall be certified to meet a federal or California standard for newly manufactured nonroad engines pursuant to 40 CFR Part 89 or Title 13 of the California Code of Regulations.
 - (B) Portable diesel-fueled engines certified to Tier 4 nonroad engine standards that are added to a fleet prior to January 1, 2015, may be counted twice in the company's fleet average determination toward compliance with the 2013 and 2017 fleet emission standards.

Authority cited: Sections 39600, 39601, 39650, 39658, 39659, 39666, 41752, 43013 and 43018 Health and Safety Code. Reference: Sections 39650, 39666, 41752, Health and Safety Code.

§ 93116.3.1 Compliance Flexibility for Diesel PM Standards.

§ 93116.4 Fleet Recordkeeping and Reporting Requirements.

§ 93116.5 Enforcement of Fleet Requirements.

- (a) Both the Executive Officer and the APCO have the authority to review or seek enforcement action for violation of the fleet emission standard.
- (b) The CARB will make available to the districts the information the Responsible Official has provided to CARB to demonstrate compliance with the fleet standard.

J

Authority cited: Sections 39600,39601,39650,39658,39659,39666,41752,43013 and 43018 Health and Safety Code. Reference: Sections 39650,39666,41752 Health and Safety Code.

PROPOSED REGULATION ORDER

AIRBORNE TOXIC CONTROL MEASURE TO LIMIT DIESEL-FUELED
COMMERCIAL MOTOR VEHICLE IDLING

Note: Proposed amendments are 'shown in underline to indicate additions and strikeout to indicate deletions, compared to the preexisting regulatory language.

Amend section 2485, title 13, California Code of Regulations to read as follows.

§ 2485. Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling.

- (a) *Purpose.* The purpose of this airborne toxic control measure is to reduce public exposure to diesel particulate matter and other air contaminants by limiting the idling of diesel-fueled commercial motor vehicles.
- (b) *Applicability.* This section applies to diesel-fueled commercial motor vehicles that operate in the State of California with gross vehicular weight ratings of greater than 10,000 pounds that are or must be licensed for operation on highways. This specifically includes:
 - (1) California-based vehicles; and
 - (2) Non-California-based vehicles.
- (c) *Requirements.*
 - (1) *Idling Restriction.*

On or after February 1, 2005, the driver of any vehicle subject to this section shall comply with the following requirements, except as noted in subsection (d) below:

 - (A) the driver shall not idle the vehicle's primary diesel engine for greater than 5.0 minutes at any location.
 - (8) the driver shall not operate a diesel-fueled auxiliary power system (APS) to power a heater, air conditioner, or any ancillary equipment on that vehicle during sleeping or resting in a sleeper berth for greater than 5.0 minutes at any location when within 100 feet of a restricted area.
 - (2) *Use of Alternative Technologies.*

- (A) On or after January 1, 2008, the driver shall not operate an internal combustion APS on any vehicle equipped with a 2007 and subsequent model year primary diesel engine unless the vehicle is:
1. equipped with an APS meeting the emissions performance requirements found in subsection (c)(3)(A), below; and
 2. the vehicle is equipped with a label meeting the requirements pursuant to section 35.B.4 of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in title 13, CeR, section 1956.8(b).
- (B) On or after January 1, 2008, the driver shall not operate a fuel-fired heater on any vehicle equipped with a 2007 and subsequent model year primary diesel engine unless the fuel-fired heater meets the emissions performance requirements found in subsection (c)(3)(B), below;
- (C) On or after January 1, 2008, the driver of a vehicle equipped with a 2006 or older model year primary diesel engine may use and operate in California any certified internal combustion APS with or without the additional PM control specified in subsection (c)(3)(A)1. or any other certified alternative idling reduction technology.
- (3) *Compliance Requirements.* As an alternative to idling the primary engine, diesel engines/vehicles may, as an option, be equipped with alternative technologies, as listed and defined below in (A), (B), and (C) of this subsection. If so equipped, these technologies are subject to the following requirements:
- (A) *Internal Combustion APS.*
1. In order to operate in California, an APS utilizing an internal combustion engine must comply with applicable California off-road and/or federal non-road emission standards and test procedures for its fuel type and power category. In addition, diesel-fueled APSs installed on vehicles equipped with primary engines certified to the 2007 and subsequent model year heavy-duty diesel engine standards, pursuant to section 1956.8(a)(2)(A) of title 13, CCR, shall either,
 - a. be equipped with a verified Level 3 in-use strategy for particulate matter control (see title 13, CCR, sections 2700 to 2710), or

- b. have its exhaust routed directly into the vehicle's exhaust pipe, upstream of the diesel particulate matter aftertreatment device.
 - 2. With advance Executive Officer approval, a certifying/verifying APS manufacturer may petition for an alternate compliance strategy other than described in (A)1.a. or b. in this subsection **above**. However, this provision is limited to manufacturers that can demonstrate, to the satisfaction of the Executive Officer, that their alternative strategy is equivalent (or "cleaner"), from an emissions standpoint, compared to the requirement described in (A)1.a. or b. in this subsection above. As an example, strategies that can use the available electric power infrastructure, instead of solely operating a diesel-fueled APS for engine and/or cab heating and cooling, may be able to use such a strategy to demonstrate compliance with these requirements.
- (B) *Fuel-Fired Heaters.* Fuel-fired heaters must comply with the applicable California emission standards and test procedures as specified in the Low Emission Vehicle program requirements found in title 13, CCR, subsections 1961(a)(15) and (d), or in Part LE.1.13 of the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," as incorporated by reference in title 13, CCR, section 1961 (d). However, the specified requirement that limits fuel-fired heaters from being operated above 40°F does not apply.
- (C) *Other Idle Reduction Technologies.* Other technologies that will reduce idling emissions may also be used, including the use of batteries, fuel cells, power inverter/chargers for on-shore electrical power, on-shore electric power infrastructure also known as truck stop electrification, and other technologies that produce minimal or no emissions. With **the** exception of battery and fuel cell powered APSs, power inverter/chargers, and electric power infrastructure, the use of other technologies are subject to advance Executive Officer approval and must be at least as effective in reducing idling emissions as the technologies described in subsections (c)(3)(A), above, or the NOx idling emission standard specified in title 13, CCR, section 1956.8(a)(6)(C). The Executive Officer shall use good engineering judgment and test data to determine if an idle reduction technology provides idling emission controls equivalent to the standards specified in subsection (c)(3)(A) above, or in title 13, CCR, section 1956.8(a)(6)(C).
- (D) *Labeling Requirements.* 2007 and subsequent modelyear commercial diesel vehicles equipped with an internal combustion APS meeting the requirements specified in subsection (c)(3)(A) shall have a label affixed

to the hood of the vehicle to allow operation of the APS in California. The labels shall meet the requirements specified in section 35.B.4 of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in title 13, CCR, section 1956.8(b).

(d) *Exceptions.*

- (1) Except when a vehicle is located within 100 feet of a restricted area, subsection (c)(1)(A) does not apply, if the vehicle is equipped with
 - (A) a primary diesel engine meeting the optional NOx idling emission standard pursuant to title 13, CCR, section 1956.8(a)(6)(C); and
 - (B) a label meeting the requirements pursuant to section 35.B.4 of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in title 13, CCR, section 1956.8(b).
- (2) Subsection (c)(1) does not apply for the period or periods during which
 - (A) a bus is idling for
 1. up to 10.0 minutes prior to passenger boarding, or
 2. when passengers are onboard;
 - (B) prior to January 1, 2008, idling of the primary diesel engine is necessary to power a heater, air conditioner, or any ancillary equipment during sleeping or resting in a sleeper berth. This provision does not apply when operating within 100 feet of a restricted area;
 - (C) idling when the vehicle must remain motionless due to traffic conditions, an official traffic control device, or an official traffic control signal over which the driver has no control, or at the direction of a peace officer, or operating a diesel-fueled APS or other device at the direction of a peace officer;
 - (D) idling when the vehicle is queuing that at all times is beyond 100 feet from any restricted area;
 - (E) idling of the primary diesel engine, operating a diesel-fueled APS, or operating other devices when forced to remain motionless due to immediate adverse weather conditions affecting the safe operation of the vehicle or due to mechanical difficulties over which the driver has no control;

- (F) idling to verify that the vehicle is in safe operating condition as required by law and that all equipment is in good working order, either as part of a daily vehicle inspection or as otherwise needed, provided that such engine idling is mandatory for such verification;
- (G) idling of the primary diesel engine, operating a diesel-fueled APS, or operating other devices is mandatory for testing, servicing, repairing, or diagnostic purposes, including regeneration or maintenance of the exhaust emission control device during engine idling when the dashboard indicator light, if so equipped, is illuminated indicating that regeneration or maintenance is in progress;
- (H) idling when positioning or prOViding a power source for equipment or operations, other than transporting passengers or propUlsion, which involve a power take off or equivalent mechanism and is powered by the primary engine for:
1. controlling cargo temperature, operating a lift, crane, pump, drill, hoist, mixer (such as a ready mix concrete truck), or other auxiliary equipment;
 2. prOViding mechanical extension to perform work functions for which the vehicle was designed and where substitute alternate means to idling are not reasonably available; or
 3. collection of solid **waste** or recyclable material by an entity authorized by contract, license, or permit by a school or local government;
- (I) idling of the primary diesel engine, operating a diesel-fueled APS, or operating other devices when operating defrosters, heaters, air conditioners, or other equipment solely to prevent a safety or health emergency;
- (J) idling of the primary diesel engine, operating a diesel-fueled APS, or operating other devices by authorized emergency vehicles while in the course of providing services for which the vehicle is designed;

idling of military tactical vehicles during periods of training, testing, and deployment; ~~and~~

idling when operating equipment such as a wheelchair or people assist lift as prescribed by the Americans with Disabilities Act;

idling of armored cars in the course of providing services for which the vehicle is designed: and

- (N) idling of *workover rigs* while performing work for which the vehicle is designed.

(e) *Relationship to Other Law.*

Nothing in this section allows idling in violation of other applicable law, including, but not limited to:

- (1) California Vehicle Code Section 22515;
- (2) Title 13, Section 2480, California Code of Regulations;
- (3) California Health and Safety Code Section 40720; or
- (4) any applicable ordinance, rule, or requirement as stringent as, or more stringent than, this section.

(f) *Enforcement.* This section may be enforced by the Air Resources Board; peace officers as defined in California Penal Code, title 3, chapter 4.5, Sections 830 et seq. and their respective law enforcement agencies' authorized *representatives*; and air pollution control or air quality management districts.

(g) *Penalties.* For violations of subsection (c)(1), (c)(2) or (c)(3), the *driver* of a subject vehicle is subject to a minimum civil penalty of 1 00 **dollars** and to criminal penalties as specified in the Health **and** Safety Code and the Vehicle Code.

(h) *Definitions.*

The following definitions apply to this section:

(1) "Armored car" is as defined in Vehicle Code Section 115

~~(1)~~(2) "Authorized emergency vehicle" is as defined in Vehicle Code Section 165.

~~(2)~~(3) "Auxiliary power system" or "APS" means any *device* that is permanently dedicated to the vehicle on which it is installed and provides electrical, mechanical, or thermal energy to the primary diesel engine, truck **cab**, and/or sleeper berth, bus's passenger compartment or any **other** commercial vehicle's cab, as an *alternative* to idling the primary diesel engine.

~~(3)~~(4) "Bus" means any vehicle defined in Title 13, California Code of Regulations, Section 2480, subsections (h) (13)-(16), **inclusive** or as defined in the Vehicle Code Section 233.

~~(4)~~~~(5)~~ "Commercial Motor Vehicle" means any vehicle or combination of vehicles defined in Vehicle Code Section 1521 O(b) and any other motor truck or bus with a gross vehicle weight rating of 10,001 pounds or more, except the following:

- (A) a zero emission vehicle; or
- (8) a pickup truck as defined in Vehicle Code Section 471.

~~(5)~~~~(6)~~ "Driver" is as defined in Vehicle Code Section 305.

~~(6)~~~~(7)~~ "Fuel-fired heater" means a fuel burning device that creates heat for the purpose of (1) warming the cab or sleeper berth compartment of a vehicle or (2) warming the engine oil and/or coolant for easy start-up of the vehicle's engine but does not contribute to the propulsion of the vehicle.

~~(7)~~~~(8)~~ "Gross vehicle weight rating" is as defined in Vehicle Code Section 350.

~~(8)~~~~(9)~~ "Highway" is as defined in Vehicle Code Section 360.

~~(9)~~~~(10)~~ "Idling" means the vehicle engine is running at any location while the vehicle is stationary.

~~(10)~~~~(11)~~ "Motor truck" or "motortruck" means a motor vehicle designed, used, or maintained primarily for the transportation of property.

@ ~~(12)~~ "Official traffic control device" is as defined in Vehicle Code Section 440.

~~(12)~~~~(13)~~ "Official traffic control signal" is as defined in Vehicle Code Section 445.

~~(13)~~~~(14)~~ "Owner" is as defined in Vehicle Code Section 460.

~~(14)~~~~(15)~~ "Primary diesel engine" means the diesel-fueled engine used for vehicle propulsion.

~~(15)~~~~(16)~~ "Queuing" means (A) through (C)

- (A) the intermittent starting and stopping of a vehicle;
- (8) while the driver, in the normal course of doing business, is waiting to perform work or a service; and
- (C) when shutting the vehicle engine off would impede the progress of the queue and is not practicable.
- (D) Queuing does not include the time a driver may wait motionless in line in anticipation of the start of a workday or opening of a location where work or a service will be performed.

~~(16)~~~~(17)~~ "Restricted area" means any real property zoned for individual or multifamily housing units that has one or more of such units on it.

M ~~(18)~~ "Safety or health emergency" means:

- (A) a sudden, urgent, or usually unforeseen, occurrence; or
- (B) a foreseeable occurrence relative to a medical or physiological condition.

~~(18)~~(19) "Sleeper berth" is as defined in Title 13; California Code of Regulations, Section 1265.

~~(19)~~(20) "Vehicle" is as defined in the Vehicle Code Section 670.

(21) "Workover rig" is as defined in Section 2449 of Title 13, California Code of Regulations.

Authority: Sections 39600, 39601, 39614(b)(6)(A), 39658, 39667, 43000.5(d), 43013(b), 43013(h), 43018(b), and 43018(c), Health and Safety Code; and *Western Oil & Gas ASSn. v. Orange County Air Pollution Control Dist.* (1975) 14 Cal.3d.411. Reference: Sections 39002,39003,39027,39500,39600,39650, 39655,39656,39657,39658,39659,39662,39665,39674,39675,42400, 42400.1,42400.2,42400.3,42402,42402.1, 42402.2, 42402.3, 42403.5, 42410, 43013, 43018, Health and Safety Code; Sections 305, 336, 350, 440, 445, 545, 546, 642, 680, 21400, 22452, 22515, 27153, 40001, 40001 (b)(5), Vehicle Code; and **Sections** 1201,1900, 1962, 2480, Title13, California Code of Regulations.

PROPOSED REGULATION ORDER

**EXHAUST EMISSIONS STANDARDS AND TEST PROCEDURES -1985 AND
SUBSEQUENT MODEL HEAVY-DUTY ENGINES AND VEHICLES**

Note: Proposed amendments are shown in underline to indicate additions and strikeout to indicate deletions, compared to the preexisting regulatory language.

Amend section 1956.8, title 13, California Code of Regulations to read as follows:

§ 1956.8. Exhaust Emissions Standards and Test Procedures -1985 and Subsequent Model Heavy-Duty Engines and Vehicles.

(a)(1) [No Change]

(a)(2)(A) The exhaust emissions from new 2004 and subsequent model heavy-duty diesel engines, heavy-duty natural gas-fueled and liquefied-petroleum-gas-fueled engines derived from diesel-cyc1e engines, and heavy-duty methanol-fueled diesel engines, and the optional, reduced-emission standards for 2002 and subsequent model engines produced beginning October 1, 2002, except in all cases engines used in medium-duty vehicles, shall not exceed:

Exhaust Emission Standards for 2004 and Subsequent Model Heavy-Duty Engines, and Optional, Reduced Emission Standards for 2002 and SUBsequent Model Heavy-Duty Engines Produced Beginning October 1, 2002, Other than Urban Bus Model-Year Engines Produced From October 1,2002 Through 2006^L (grams per brake horsepower-hour [g/bhp-hr])

<i>Model Year</i>	<i>Oxides of Nitrogen Plus Non-methane Hvdrocarbons</i>	<i>Optional Oxides of Nitrogen Plus Non-methane Hvdrocarbons</i>	<i>Oxides of Nitrogen</i>	<i>Non-methane Hydrocarbons</i>	<i>Carbon Monoxide</i>	<i>Particulates</i>
2004-2006 ^H	2.4 A,C,E,J	2.5 B,C,E,J	<i>nla</i>	<i>nla</i>	15.5	0.10 ^C
October 1, 2002-2006	<i>nla</i>	1.8 to 0.3 A,D,F	<i>nla</i>	<i>nla</i>	15.5	0.03 to 0.01 G
2007 and subsequent ^M	<i>nla</i>	<i>nla</i>	0.20 ¹	0.14	15.5	0.01 ^K

A This is the standard for the arithmetic sum of the oxides of nitrogen ,exhaust component certification value and the non-methane hydrocarbon exhaust component certification value, without individual restriction on the individual component values.

B This is the standard for the arithmetic sum of the oxides of nitrogen exhaust component certification value and the non-methane hydrocarbon exhaust component certification value, with the non-methane hydrocarbon individual component **value** not to exceed 0.5 g/bhp-hr.

C For 2004 through 2006 model years, emissions averaging may be used to meet this standard. Averaging must be based on the requirements of the averaging, banking and trading programs described in "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent

Model Heavy-Duty Diesel Engines and Vehicles" incorporated by reference in section 1956.8(b), below.

- D A manufacturer may elect to certify to an optional reduced-emission NO_x+NMHC standard between the values, inclusive, by 0.3 grams per brake horsepower-hour increments. Engines certified to any of these optional reduced-emission NO_x standards are not eligible for participation in any averaging, banking or trading programs described in "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles" incorporated by reference in section 1956.8 (b), below.
- E May be used as the certification standard for the higher emitting fueling mode of an engine certified under the dual fueling mode certification process of section 1956.8(a)(4), below.
- F May be used as the certification standard for the lower emitting fueling mode of an engine certified under the dual fueling mode certification process of section 1956.8(a)(4), below.
- G A manufacturer may elect to certify to an optional reduced-emission PM standard between the specified values, inclusive, by 0.01 grams per brake horsepower-hour increments. Engines certified to any of these optional reduced-emission PM standards are not eligible for participation in any averaging, banking or trading programs described in "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles" incorporated by reference in section 1956.8(b), below.
- H Engine manufacturers subject to the Heavy-Duty Diesel Engine Settlement Agreements (Settlement Agreements)¹ must produce engines in compliance with the requirements contained in their respective Settlement Agreement. Most engine manufacturers subject to the Settlement Agreements are required to manufacture engines meeting the exhaust emission standards for 2004 and subsequent model years engines beginning October 1, 2002.

A manufacturer may elect to include any or all of its heavy-duty diesel engine families in any or all of the NO_x emissions averaging, banking, or trading programs for heavy-duty diesel engines, within the restrictions described in "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles" incorporated in section 1956.8 (b), below. If the manufacturer elects to include engine families in any of these programs, the NO_x family emission limit (FEL) may not exceed the following FEL caps: 2.00 grams per brake horsepower-hour (0.75 grams per megajoule) for model years before 2010; 0.50 grams per brake horsepower-hour (0.19 grams per-megajoule) for model years 2010 and later. The FEL cap applies whether credits for the engine family are derived from averaging, banking, or trading programs.
- J For 2007 through 2009 model years, a manufacturer may use these emission standards in accordance with section 1956.8 (a)(2)(B). A manufacturer may elect to include any or all of its heavy-duty diesel engine families in any or all of the NO_x plus NMHC emissions averaging, banking, or trading programs for heavy-duty diesel engines, within the restrictions described in "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles" incorporated in section 1956.8 (b), below. If the manufacturer elects to include engine families in any of these programs, the NO_x family emission limit (FEL) may not exceed the following FEL caps: 2.00 grams per brake horsepower-hour (0.75 grams per megajoule) for model years. The FEL cap applies whether credits for the engine family are derived from averaging, banking, or trading programs.
- K A manufacturer may elect to include any or all of its heavy-duty diesel engine families in any or all of the particulate averaging, banking, or trading programs for heavy-duty diesel engines, within the restrictions described in "California Exhaust Emission Standards and Test Procedures for 1985 and

¹Seven of the largest heavy-duty diesel engine **manufacturers** will be implementing measures to reduce emissions beginning October 1, 2002, to meet the requirements of the Heavy-Duty Diesel Engine Settlement Agreements reached with the ARB. The Heavy-Duty Diesel Engine Settlements were agreements reached in response to lawsuits brought by the United States Environmental Protection Agency and violations alleged by the ARB pertaining to excess in-use emissions caused by the use of defeat devices and unacceptable algorithms. Navistar signed its Settlement Agreement on October 22, 1998. Cummins, Detroit Diesel Corporation, Caterpillar, Volvo, Mack and Renault signed their Settlement Agreements on December 15, 1998.

Subsequent Model Heavy-Duty Diesel Engines and Vehicles" incorporated by reference in section 1956.8 (b), below. The particulate FEL for each engine family a manufacturer elects to include in any of these programs may not exceed an FEL cap of 0.02 grams per brake horsepower-hour (0.0075 grams per megajoule). The FEL cap applies whether credits for the engine family are derived from averaging, banking, or trading programs.

- L For 2007 and **subsequent** model **year** urban bus engines, this section applies. For urban bus model-year engines produced from October 1, 2002 through 2006, refer to section 1956.1.
- M For model years between 2007 and 2009, transit agencies purchasing urban buses and/or urban bus engines shall meet the requirements set forth in section 2023.1.

(a)(6) Heavy-Duty Diesel Engine Idling Requirements.

(A) Engine Shutdown System *Engine Shutdown System*. The requirements in this subsection apply to engine manufacturers and original equipment manufacturers, as applicable, that are responsible for ~~the~~ design and control of engine and/or vehicle idle controls.

1. Requirements: Except as provided in subsections (a)(6)(8) and (a)(6)(C), all new 2008 and subsequent **model-year** heavy-duty diesel engines shall be equipped with an engine shutdown system that automatically shuts down the engine after 300 seconds of continuous idling operation once the vehicle is stopped, the transmission is set to "neutral" or "park", and the parking brake is engaged. If the parking brake is not engaged, then the engine shutdown system shall shut down the engine after 900 seconds of continuous idling operation once the vehicle is stopped and the transmission is set to "neutral" or "park." The engine shutdown system must be tamper-resistant and non-programmable. A warning signal, such as a light or sound indicator inside the vehicle cabin, may be **used** to alert the driver 30 seconds prior to engine shutdown. The engine shutdown system must be capable of allowing the driver to reset the engine shutdown system timer by momentarily changing the position of the accelerator, brake, or clutch pedal, or other mechanism within 30 seconds prior to engine shutdown. Once reset, the engine shutdown system shall restart the engine shutdown sequence described in this paragraph above, and shall continue to do so until the engine shuts down or the vehicle is driven.

2. Engine Shutdown System Override *Engine Shutdown System Override*: The engine shutdown system may be overridden, to allow the engine to run continuously at idle, only under the following conditions:

a. if the engine is operating in power take off (PTO) mode *If the engine is operating in power take-off (PTO) mode*.

The PTO system shall have a switch or a setting that can be switched "on" to override the engine shutdown system and will reset to the "off" position when the vehicle's engine is turned off or when the PTO equipment is turned off. Subject to advance Executive Officer approval, other methods for detecting or activating PTO operation may be allowed; or,

b. if the vehicle's engine coolant temperature is below 60°F./*if the vehicle's engine coolant temperature is below 60°F* .

The engine shutdown system shall automatically be activated once the coolant temperature reaches 60°F or above. The engine coolant temperature shall be measured with the engine's existing engine coolant temperature sensor used for engine protection, if so equipped. Other methods of measuring engine coolant temperature may be allowed, subject to advance Executive Officer approval.

c. ~~if~~ *if* an exhaust emission control device is regenerating, and keeping the engine running is necessary to prevent aftertreatment or engine damage, the engine shutdown system may be overridden for the duration necessary to complete the regeneration process up to a maximum of 30 minutes. Determination of what constitutes the need for regeneration will be based on data provided by the manufacturer at time of certification. Regeneration events that may require longer than 30 minutes of engine idling to complete shall require advance Executive Officer approval. At the end of the regeneration process, the engine shutdown system shall automatically be enabled to restart the engine shutdown sequence described in subparagraph (a)(6)(A)1. above. A vehicle that uses a regeneration strategy under engine idling operating conditions shall be equipped with a dashboard indicator light that, when illuminated, indicates that the exhaust emission control device is regenerating. Other methods of indicating that the exhaust emission control device is regenerating may be used with advance Executive Officer approval.

d. If servicing or maintenance of the engine requires extended idling operation. The engine's electronic control module may be set to temporarily deactivate the engine shutdown system for up to a maximum of 60 minutes. The deactivation of the engine shutdown system shall only be performed with the use of a diagnostic scan tool. At the end of the set deactivation period, the engine's electronic control module shall reset to restart the engine shutdown system sequence described in subparagraph (a)(6)(A) above.

(B) ~~Exempt~~ *Exempt Vehicles*. Heavy-duty diesel engines to be used in buses as defined in California Vehicle Code sections 233,612 and 642, school buses as defined in California Vehicle Code section 545, recreational vehicles as defined in Health and Safety Code 18010, medium duty vehicles as defined in section 1900(b)(13) of title 13, California Code of Regulations, military tactical vehicles as defined in section 1905 of title 13, California Code of Regulations, ~~and~~ *and* authorized emergency vehicles as defined in California Vehicle Code section 165, armored cars. as defined in California Vehicle Code sections 115, and workover rigs, as defined in section 2449 of title 13, California Code of Regulations are exempted from these requirements.

(C) Optional ~~NOx~~ *Optional NOx idling omission standard*. *Optional NOx idling emission standard*. In lieu of the engine ~~shutdown~~ system requirements specified in subsection (a)(6)(A) above, an engine manufacturer may elect to certify its new 2008 and subsequent model-year heavy-duty diesel engines to an optional NOx idling emission standard of 30 grams per hour. Compliance with this optional standard will be determined based on testing conducted pursuant to the supplemental

NOx idling test cycle and procedures specified in section 86.1360-2007.8.4 of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," as incorporated by reference in subsection (b). The manufacturer may request an alternative test procedure if the technology used cannot be demonstrated using the procedures in section 86.1360-2007.8.4, subject to advance approval of the Executive Officer. A manufacturer certifying to the optional NOx idling standard must not increase emissions of CO, PM, or NMHC, determined by comparing results from the supplemental NOx idling test cycle and procedures specified in section 86.1360-2007.8.4 of the referenced "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles" to emission results from the idle mode of the supplemental steady state test cycle or emission results from idle portions of the transient test cycle for heavy duty diesel engines, respectively specified in sections 86-1360-2007 and 86.1327-98 of the referenced "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles." With advance Executive Officer approval, a manufacturer may use other methods of ensuring that emissions of CO, PM, and NMHC are not adversely affected in meeting the optional NOx requirement. Also, manufacturers shall state in their application for certification that meeting the optional NOx idling requirement will not adversely affect the associated emissions of CO, PM and NMHC.

An engine manufacturer certifying its engine to the optional NOx idling emission standard must also produce a vehicle label, as defined in subsection 35.8.4 of the "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles" as incorporated by reference in subsection (b).

(D) Optional Alternatives to Main Engine Idling *Optional Alternatives to Main Engine Idling*. All new 2008 and subsequent model year heavy duty diesel engines may also be equipped with idling emission reduction devices that comply with the compliance requirements specified in title 13, CCR section 2485(c)(3).

(b) through (h) [No Change.]

NOTE: Authority cited: Sections 39500,39600,39601,43013,43018,43100,43101, 43102,43104,43105,43106,43107, and 43806, Health and Safety Code; and Section 28114, Vehicle Code. Reference: Sections 39002,39003,39500,39667,43000, 43009.5,43013,43017,43018,43100,43101,43101.5,43102,43104,43105,43106, 43107,43202,43204,43205,43205.5,43206,43210,43211,43212,43213, and 43806, Health and Safety Code; and Section 28114, Vehicle Code.

TITLE" 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER THE ADOPTION OF A REGULATION TO REDUCE GREENHOUSE GAS EMISSIONS FROM HEAVY-DUTY VEHICLES

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider adopting a regulation to reduce greenhouse gas (GHG) emissions from **heavy-duty** vehicles (HDVs). HDVs are commonly used for freight transport and typically consist of a heavy-duty tractor (tractor), the power unit, and a trailer, the towed unit. The proposed regulation affects 53-foot or longer box-type trailers and the tractors that pull them, when operating on California highways.

This notice summarizes the proposed regulatory action. The staff report document presents the proposed regulation and information supporting the adoption of the regulation in greater detail.

DATE: December 11, 2008

TIME: 9:00 a.m.

PLACE: California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., December 11, 2008, and may continue at 8:30 a.m., December 12, 2008. This item may not be considered until December 12, 2008. Please consult the agenda for the meeting, which will be available at least ten days before December 11, 2008, to determine the day on which this item will be considered.

During the course of the Board's consideration of this proposal, it may adjourn to allow the public and interested parties to view new and emerging technologies that are being developed for use in complying with the proposed rulemaking.

For individuals with sensory **disabilities**, this document and other related material can be made available in Braille, large print, audiocassette, or computer disk. For assistance, please contact ARB's Reasonable Accommodations/Disability Coordinator at 916-323-4916 by voice or through the California Relay Services at 711, to place your request for disability services, or go to <http://www.arb.ca.gov/html/ada/ada.htm>.

If you are a person with limited English and would like to request interpreter services to be available at the Board meeting, please contact ARB's Bilingual Manager at 916-323-7053.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed adoption to California Code of Regulations (CCR), title **17, new sections 95300,95301,,95302,95303,95304,95305,-95306, 95307, 95308,** 95309,95310,95311, and 95312.

Background

In 2006 the legislature passed and Governor Schwarzenegger signed the California Global Warming Solutions Act of 2006 (AB 32; Stats. 2006, chapter 488). In AB 32 the Legislature declared that global warming poses a "serious threat to the economic well-being, public health, natural resources, and the environment of California. The Legislature further declared that global warming will **have** detrimental effects on **some** of California's largest industries'including agriculture and tourism, and will increase the strain on electricity supplies. While national and international actions are necessary to fully address the issue of global warming, the Legislature recognized that action taken by California to reduce emissions of greenhouse gases will have far-reaching effects by encouraging other states, the federal government, **and** other countries to act.

AB 32 creates a comprehensive, multi-year program to reduce GHG emissions in California, with the overall goal of restoring emissions to 1990 levels by the year 2020. AB 32 requires ARB to do many things, including:

- Establishing a statewide GHG emissions cap for 2020, based on 1990 emissions;
- Adopting a scoping plan by January 1, 2009, indicating how emission reductions will be "achieved from significant GHG sources via regulations, market mechanisms and other actions;
- By June 30, 2007, adopting a list of discrete, early action GHG emission reduction measures that can be implemented and enforced no later than January 1, 2010; and
- By January 1, 2010, adopting regulations to implement the measures identified on the list of discrete early action measures.

In 2007 the Board approved a list of nine discrete early, action measures. The list includes a measure entitled: "Smartway Truck Efficiency." The proposed regulation is designed to implement this measure.

Description of the Proposed Regulatory Action

The proposed regulation would reduce GHG emissions by requiring some of the new and existing on-road tractors and trailers operating on California highways to be equipped with technologies that would result in improved fuel efficiency, and thus

reduce GHG emissions. The proposed regulation references a federal voluntary program, called the United States Environmental Protection Agency (U.S. EPA) SmartWay Partnership Program, which is designed to improve the environmental performance associated with the ground freight delivery system in the United States. In particular, the SmartWay program approves technologies, such as aerodynamic equipment and low-rolling resistance tires, and certifies tractors and trailers that incorporate these technologies. The proposed regulation relies on the SmartWay program to establish mandatory California tractor and trailer requirements. More specifically, the proposed regulation requires the use of SmartWay certified tractors and trailers, SmartWay approved aerodynamic technologies and low-rolling resistance tires. Examples of aerodynamic technologies include integrated roof fairings on sleeper-cab tractors; and side skirts, gap fairings, and rear trailer fairings on box-type trailers.

The proposed regulation would provide GHG and oxides of nitrogen (NOx) emission reductions throughout California. Tractors and trailers that comply with the proposed regulation by proper use of aerodynamic equipment and low-rolling resistance tires are expected to achieve a fuel efficiency improvement ranging from 7 to 10 percent. Staff estimates that this improvement in fuel efficiency will result in a reduction in tailpipe GHG emissions of approximately 1 million metric tons of CO₂-equivalents (MMT CO₂e) statewide in 2020 and approximately 6.7 MMT CO₂e nationwide. Staff estimates that the cumulative GHG reductions in California from 2010 to 2020, as new fuel efficient tractors and trailers are introduced and in-use tractors and trailers are retrofitted with fuel efficient technologies, will be reduced by a cumulative total of approximately 7.8 MMT CO₂e statewide and approximately 52.1 MMT CO₂e nationwide. Staff also estimates NOx reductions in California of 4.3 and 1.4 tons per day in 2014 and 2020 respectively. These reductions will help with progress toward attainment of National and State ambient air quality standards for particulate matter and ozone:

The proposed regulation focuses on long-haul tractors, because the required technologies offer the most efficient improvements at highway speeds. Thus, the proposed regulation would establish requirements for new and existing 53-foot or longer box-type trailers and the tractors that pull them. The proposed regulation would apply to both California-registered and out-of-state-registered tractors and trailers. For purposes of the proposed regulation, a box-type trailer is a dry-van trailer or a refrigerated-van trailer. As proposed, the regulation would not apply to tractors pulling other types of trailers (e.g., box-type trailers of lengths shorter than 53 feet, or tractors pulling flatbed trailers, logging trailers, drop-frame trailers, curtain side trailers, or chassis trailers hauling shipping containers). Authorized emergency vehicles and military tactical support vehicles, as well as short-haul and drayage tractors that have been provided an express exemption by ARB, would also be exempt from the requirements under the regulation as proposed.

The proposed regulation includes the following compliance schedules:

- Beginning January 1, 2010, a 2011 model year or subsequent model year tractor with a sleeper berth that pulls a 53-foot or longer box-type trailer on a California

highway **would** be required to be a U.S. EPA certified SmartWay tractor. SmartWay does not **currently** certify a daycab tractor (without a sleeper berth), so daycab tractors would not be required to **be** SmartWay certified. Low-rolling resistance tires that meet U.S. EPA SmartWay specifications would **be required**, beginning January 1, 2010, for all affected 2011' and subsequent model year tractors, regardless of whether they have sleeper berths or not. '

- Beginning January 1, 2012, any tractor with or without a sleeper berth that pulls a 53-foot or longer box-type trailer on a California highway would be required to be equipped with SmartWay approved low-rolling resistance tires. This would be the only retrofit requirement for tractors with model years 2010 and earlier, and would allow most 2010 or earlier model year tractors to use their existing tires for the remainder of their usefullife before replacing them with low-rolling resistance tires.
- Beginning January 1, 2010, a 2011 model year and subsequent model year 53-foot or longer box-type trailer, including a **refrigerated** trailer, that is pulled by a tractor on a California highway would be required to be either a U.S. EPA certified SmartWay trailer or fitted with the SmartWay approved technologies ' described in the proposed regulation. Currently only dry-van trailers are U.S. EPA SmartWay certified. U.S. EPA has **not** developed specifications for refrigerated trailers, although they may do so in the future. Thus, at present, new, 2011 model year refrigerated trailers will be required to be retrofitted with SmartWay approved components as specified in the regulation.
- Beginning January 1, 2013, 2010 model year and earlier model year 53-foot or longer **box-type** trailers would be required to be retrofitted with the SmartWay , approved technologies described in the regulation. In lieu of meeting the January 1, 2013, compliance date, the trailer owner could choose to comply with an optional trailer fleet compliance schedule.

There are two **proposed** optional trailer fleet compliance schedules that would be based on size of the trailer fleet. These would allow fleets until 2015 or 2016 to retrofit all trailers that are subject to the proposed regulation. A separate optional schedule is' proposed for refrigerated-van trailers, with diesel-fueled transport refrigeration units; this schedule provides additional years for compliance ,because owners of these vehicles .will be subjected to another ARB regulation, the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU GeRerator Sets,' and Facilities Where TRUs Operate.

The proposed regulation would expressly apply to owners of tractors pulling 53-foot or longer box-type trailers and oWners of 53-foot or longer box-type trailers, drivers of tractors pUlling 53-foot or longer box-type trailers, motor carriers and California-based brokers that dispatch 53-foot or longer box-type trailers, and California-based shippers that ship **freight** in 53-foot or longer box-type trailers.

COMPARABLE FEDERAL REGULATIONS

There are no comparable mandatory federal regulations to control GHG emissions from motor vehicles. As described above, the proposed regulation is based on a voluntary federal program, the U.S. EPA SmartWay Partnership Program.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

ARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposed regulation. The Staff Report is entitled: Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider Adoption of the Regulation to Reduce Greenhouse Gas Emissions from Heavy-Duty Vehicles.

Copies of the ISOR with the full text of the proposed new regulatory language may be accessed on the ARB's website listed below, or may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, (916) 322-2990 at least 45 days prior to the scheduled hearing on December 11, 2008.

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact person in this notice, or may be accessed on the ARB's website listed below.

Inquiries concerning the substance of the proposed regulation may be directed to the designated agency contact persons, Daniel Hawelti, Air Resources Engineer, On-Road Heavy-Duty Diesel Section, at (626) 450-6149, or by email atdhawelti@arb.ca.gov. or Alex Santos, Staff Air Pollution Specialist, On-Road Heavy-Duty Diesel Section, at (626) 575-6682, or by email atasantos@arb.ca.gov.

Further, the agency representatives and designated back-up contact persons, to whom nonsubstantive inquiries concerning the proposed administrative action may be directed, are Lori Andreoni, Manager, Board Administration & Regulatory Coordination Unit, (916) 322-4011, or Amy Whiting, Regulations Coordinator, (916) 322-6533. The Board has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

This notice, the ISOR and all subsequent regulatory documents, including the FSOR, when completed, are available on the ARB website for this rulemaking at www.arb.ca.gov/regact/2008/ghghdv08/ghghdv08.htm.

COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

The determinations of the Board's Executive Officer concerning the costs or savings necessarily incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulations are presented below.

Pursuant to Government Code sections 11346.5(a)(5) and 11346.5(a)(6), the Executive Officer has determined that the proposed regulatory action will not create: costs or savings in federal funding to the State; or costs or mandate to any local agency or school district whether or not reimbursable by the State pursuant to the Government Code, title 2, division 4, part 7 (commencing with section 17500); or other nondiscretionary cost or savings to state or local-agencies. The Executive Officer has determined that the proposed regulatory action would create costs to a State agency in the form of costs to ARB to implement and enforce the regulation and to contract with the California Highway Patrol and air quality management districts and air pollution control districts (Districts) for enforcement. No costs or savings affecting other State agencies were identified.

Staff estimates that the total costs to the ARB for implementation and enforcement of the regulation, including contract costs to Districts and CHP for enforcement, would be approximately \$68 million (2008 dollars) for the period from 2010 through 2020. Annual costs are expected to be about \$6.5 million per year.

In developing this regulatory proposal, ARB staff evaluated the potential economic impacts on representative private persons or businesses. The determinations of the Board's Executive Officer concerning the costs or savings necessarily incurred by private persons and businesses in reasonable compliance with the proposed regulations are presented below.

In general, the owners of tractors and 53-foot or longer box-type trailers subject to the proposed regulation would incur capital costs associated with the initial purchase and installation of aerodynamic technologies and low-rolling resistance tires. Staff estimates that the cost for a Smartway tractor-trailer combination is approximately \$5,000. However, the industry average trailer-to-tractor ratio is estimated to be 2.5 to 1 per owner. This translates into an average cost of \$9,200 per owner. A state guarantee loan program will be available to help finance early compliance with these requirements.

Operating cost savings resulting from the fuel efficiency improvement associated with operating compliant tractors and trailers will be substantial. For example, in 2010, assuming that most compliant tractors and trailers would realize an 8 percent fuel economy gain when operating at highway speeds, and that diesel fuel is priced at \$3.14 per gallon, the net savings would be approximately \$4,200 per year for a tractor and trailer combination. The fuel savings would fully offset the initial cost of the SmartWay equipment in 1.5 years. This net savings, realized by fleet operators and owner, operators of compliant tractors and trailers, is directly attributed to operating cost

savings associated with improved fuel economy. Overall, the benefits of this proposed regulation are approximately two times greater than the cost. .

The Executive Officer has made an initial determination that the proposed regulatory action would not have a significant statewide adverse economic impact directly **affecting** businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons. As explained above, individual businesses affected by the proposed regulation may suffer an initial adverse impact due to the up-front costs associated with acquisition of aerodynamic technologies and low-rolling **resistance** tires. These initial costs are expected to be recouped through savings from reduced fuel use, and the proposed regulation is expected to result in a substantial net savings for the businesses that operate tractors with SmartWay devices and **tires** and that pull trailers also equipped with these. Businesses that are required to **equip** trailers with aerodynamic technologies and low-rolling resistance tires but that **do** not own or operate tractors - including owners of trailer fleets and certain shippers -- may not directly recoup initial costs if they do not directly pay for **fuel** costs. But ARB staff anticipates that at least some of the fuel savings from trailers equipped with SmartWay devices and tires will be indirectly shared by trailer owners through price structures that reflect fuel savings associated with these trailers.

In accordance with Government Code section 11346.3, the Executive Officer has determined that the proposed regulatory action would affect the creation or elimination of jobs within the State of California, the creatio'n of new businesses or elimination of existing businesses within the State of California, or the expansion of businesses' currently doing business' within the State of California.

Because of the potentially large up-front capital cost imposed by this regulation on larger fleets where the trailer-to-tractor ratio is high, some businesses with affected fleets will not experience a full return on investment in required equipment for several years. It is also possible that some businesses will choose to consolidate (or merge), change owners, rent vehicles (rather than own), or relocate due to this regulation. It is also very likely that additional businesses will be created or existing businesses expanded to aid in the manufacturing, distribution, installation, and **maintenance** of aerodynamic technologies and low-rolling resistance **tires** as a result of the regulation. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the ISOR. .

The Executive Officer has also determined, pursuant to CCR, title 1, section 4, that the proposed regulatory action would affect small businesses. Staff assumes a small business owner does not own any trailers, but contracts **with** companies to haul compliant trailers. A detailed assessment of the economic impacts of the proposed regulatory action on small busioesses and **other** businesses can be found in the ISOR.

In accordance with Government Code sections 11346.3(c) and 11346.5(a)(11), the Executive Officer has found that the reporting requirements of the regulation which apply to businesses are necessary for the health, safety, and welfare of the people of

the State of California. The reporting requirements are necessary for the enforcement of the regulation. Without effective enforcement, we cannot achieve the emission reductions and public health benefits associated with the proposed regulation.

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board, or that has otherwise been identified and brought to the attention of the Board, would be more effective in carrying out the purpose for which the action is proposed, or would be as effective and less burdensome to affected private persons than the proposed action.

SUBMITTAL OF COMMENTS

Interested members of the public may also present comments orally or in writing at the meeting, and by email or other writing before the meeting. To be considered by the Board, written comment submissions not physically submitted at the meeting must be received no later than 12:00 noon, December 10, 2008, and addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: <http://www.arb.ca.gov/lispub/comm/bclist.php>

Facsimile submittal: (916) 322-3928

Please note that under the **California** Public Records Act (Gov. Code, §6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone number, email address, etc.) become part of the public record and can be released to the public upon request. Additionally, this information may become available via Google, Yahoo, and any other search engines.

The Board requests, but does not require, that 30 copies of any written statement be submitted and that all written statements be filed at least ten days prior to the hearing so that ARB staff and Board Members have time to fully consider each comment. The Board encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under the authority granted in Health and Safety Code sections 38510, 38560, 38560.5, 39600, 39601. This action is proposed to implement, interpret and make specific Health and Safety Code sections 38560, 38560.5, 38580, and 39600.

HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340) of the Government Code.

Following the public hearing, the Board may adopt the regulatory language as originally proposed, or with non substantial or grammatical modifications. The Board may also adopt the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice and that the regulatory language as modified could result from the proposed regulatory action; in such event, the full regulatory text, with the modifications clearly indicated, will be made available to the public, for written comment, at least 15 days before it is adopted.

The public may request a copy of the modified regulatory text from the ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, (916) 322-2990.

CALIFORNIA AIR RESOURCES BOARD



James N. Goldstene
Executive Officer

Date: October 14, 2008

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

State of California
AIR RESOURCES BOARD

ERRATA

STAFF REPORT: INITIAL STATEMENT OF REASONS

**PROPOSED REGULATION TO REDUCE GREENHOUSE GAS EMISSIONS FROM
HEAVY-DUTY VEHICLES**

Public Hearing Date: December 11, 2008
Date of Initial Statement of Reasons: October 24, 2008
Errata Release Date: November 25, 2008

PLEASE BE ADVISED that this errata corrects an error in an appendix to the Initial Statement of Reasons for the Proposed Regulation to Reduce Greenhouse Gas Emissions from Heavy-Duty Vehicles, dated October 24, 2008. This correction updates the material made available and posted to the Air Resources Board (ARB) rulemaking website on October 24, 2008.

Change to Appendix E of Staff Report

On page E-4 of Appendix E: Fleet Summaries, under the subheading of "Other devices have tried/tested in the past," ARB has determined that the following statement is inaccurate and is therefore removing it from the Staff Report:

- "Strakes on side of trailer did not find fuel economy improvement (in fact, saw a 1% increase in fuel consumption ~~with~~ them)"

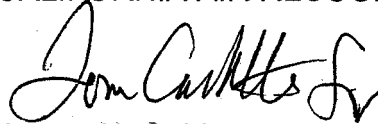
The balance of the Staff Report and appendices remains the same as released on October 24, 2008.

The complete text of the notice and the Initial Statement of Reasons are available on the ARB Internet site for this rulemaking at <http://www.arb.ca.gov/regact/2008/ghghdv08/ghghdv08.htm>

Any questions regarding these corrections should be directed to Lori Andreoni, Manager, Board Administration & Regulatory Coordination Unit, at (916) 322-4011, or Trini Balcazar, Regulations Coordinator, at (916) 445-9564.

For individuals with sensory disabilities, this document and other related material can be made available in Braille, large print, audiocassette, or computer disk. For assistance, please contact ARB's Reasonable Accommodations/Disability Coordinator at 916-323-4916 by voice, or through the California Relay Services at 711, to place your request for disability services, or go to <http://www.arb.ca.gov/html/ada/ada.htm>.

CALIFORNIA AIR RESOURCES BOARD



James N. Goldstene
Executive Officer

Date: November 17, 2008



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



**PUBLIC HEARING TO CONSIDER ADOPTION OF THE
REGULATION TO REDUCE GREENHOUSE GAS EMISSIONS
FROM HEAVY-DUTY VEHICLES**

Mobile Source Control Division
Emission Research and
Regulatory Development Branch

October 2008

**State of California
AIR RESOURCES BOARD**

**Initial Statement of Reasons:
Proposed Regulation to Reduce Greenhouse Gas Emissions from
Heavy-Duty Vehicles**

Public Hearing to Consider

**ADOPTION OF PROPOSED REGULATION TO REDUCE GREENHOUSE GAS
EMISSIONS FROM HEAVY-DUTY VEHICLES**

To be considered by the Air Resources Board on December 11, 2008, at:

California Environmental Protection Agency
Air Resources Board
Byron Sher Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

Mobile Source Control Division

Robert Cross, Chief
Steven Abu, Assistant Chief

Emission Research and Regulatory Development Branch
Michael Carter, Chief

On-Road Heavy Duty Diesel Section
Stephan Lemieux, Manager

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

**State of California
AIR RESOURCES BOARD**

**PROPOSED REGULATION TO REDUCDE GREENHOUSE GAS EMISSIONS FROM
HEAVY-DUTY VEHICLES**

Primary Authors

Stephan Lemieux
Daniel Hawelti
David Chen
Susan O'Connor
Dassi Pintar
Alex Santos

Contributing Authors

Keith Macias
LeiZhou
Andrew Spencer
Ryman Simangan
Krista Fregoso

Legal Counsel

Stephen Adams, Office-of Legal Affairs

Supporting Divisions

Planning and Technical Support Division
Enforcement Division

Acknowledgements

This report was prepared with the assistance and support from the other divisions and offices of the Air Resources Board. In addition, we would like to acknowledge the assistance and cooperation that we have received from many individuals and organizations.

TABLE OF CONTENTS

EXECUTIVE SUMMARY		ES1
I.	Introduction and Overview	1
A.	INTRODUCTION	1
B.	OVERVIEW	1
II.	Regulatory Authority	2
A.	SUMMARY OF REGULATORY AUTHORITY	2
III.	Public Outreach and Environmental Justice	3
A.	PUBLIC OUTREACH EFFORTS	3
B.	ENVIRONMENTAL JUSTICE	8
IV.	Need for Greenhouse Gas Emission Reductions	8
V.	On-road Vehicle Descriptions	8
A.	OVERVIEW	8
B.	HEAVY-DUTY TRACTORS	9
C.	BOX-TYPE TRAILERS	10
VI.	Population and GHG Contribution from Heavy-Duty Vehicles	11
A.	POPULATION	11
B.	GHG CONTRIBUTION	15
VII.	U.S. EPA SmartWay Transport Partnership	17
A.	DESCRIPTION OF PROGRAM	17
B.	SMARTWAY TRACTORS	19
C.	SMARTWAY TRAILERS	20
VIII.	Proposed Regulation	20
A.	PROPOSED REGULATION OVERVIEW	20
B.	PURPOSE	21
C.	APPLICABILITY	21
D.	DEFINITIONS	21
E.	REQUIREMENTS AND COMPLIANCE DEADLINES	22
F.	MAINTENANCE REQUIREMENTS	27

G.	EXEMPTIONS	27
H.	REPORTING REQUIREMENTS	28
I.	ENFORCEMENT AND FINES	28
IX.	Technological Feasibility of Control Measure	29
A.	SMARTWAY CERTIFIED TRACTORS	29
B.	TRAILER AERODYNAMIC TECHNOLOGIES	33
C.	TRACTOR AND TRAILER LOW-ROLLING RESISTANCE TIRES	42
X.	Alternatives Considered	46
A.	No ACTION	48
B.	EXPAND APPLICABILITY	50
XI.	Environmental Impact	51
A.	LEGAL REQUIREMENTS	51
B.	REASONABLY FORESEEABLE ENVIRONMENTAL IMPACTS	52
C.	REASONABLY FORESEEABLE MITIGATION MEASURES	57
D.	ALTERNATIVE MEANS OF COMPLIANCE WITH THE PROPOSED REGULATION	57
XII.	Cost and Economic Impact.....•.....	57
A.	SUMMARY	57
B.	LEGAL REQUIREMENTS	58
C.	METHODOLOGY FOR ESTIMATING COST AND ECONOMIC IMPACT	59
D.	ESTIMATED COSTS OF THE PROPOSED REGULATION	59
E.	POTENTIAL IMPACT ON A SMALL BUSINESS	63
F.	POTENTIAL IMPACT ON EMPLOYMENT, BUSINESS CREATION, ELIMINATION, OR EXPANSION	64
G.	ESTIMATED COSTS TO LOCAL, STATE, AND FEDERAL AGENCIES	65
H.	COST-EFFECTIVENESS OF THE PROPOSED REGULATION	66
I.	SUMMARY OF CURRENT FINANCIAL ASSISTANCE AND GRANT PROGRAMS	67
XIII.	Requirements of AS 32	69
XIV.	Issues	75
A.	MEXICAN BORDER ISSUES	75
B.	OTHER RULEMAKINGS	76

	488
XV. Recommendation	79
XVI. References	80

Appendix A: Proposed Regulation to Reduce Greenhouse Gas Emissions from Heavy-Duty Vehicles

Appendix B: Workshop Notice Flyers

Appendix C: Emission Inventory Analysis and Results

Appendix D: U.S. EPA SmartWay Documents

Appendix E: Fleet Summaries

Appendix F: Optional Trailer Fleet Compliance Schedules

Appendix G: Implementation and Enforcement

Table of Contents (cont.)

List of Tables

Table 11I-1: Public Workshop Dates, Locations and Times	3
Table 11I-2: Presentations	5
Table 11I-3: Associations, Companies and Other Organizations Contacted	5
Table VI-1: 2010 and 2020 Tractor Population and Annual VMT in California	12
Table VI-2: Percentage of Tractors with Primary Range of Operation Greater than 100 Miles	12
Table VI-3: Percentage of 53-Foot Box Type Trailers	13
Table VI-4: 2010 and 2020 Impacted Tractor Population and the Corresponding Annual VMT	14
Table VI-5: 2010 and 2020 Impacted 53-Foot Box-Type Trailers	15
Table VI-6: 1990, 2002-2004 Average, and 2020 Projected Transportation Sector GHG Emissions (MMT CO ₂ e) (ARB, 2008b)	16
Table VIII-1: Proposed Tractor Requirements	23
Table VIII-2: Proposed 2011 and Later Model Year Trailer Compliance Options, Beginning January 1, 2010	24
Table VIII-3: Proposed Optional Large Fleet (21+) Compliance Schedule for 2010 and Earlier Model Year 53-foot or Longer Box-Type Trailers, Except Refrigerated-Van Trailers with Transport Refrigeration Units using 2003 to 2009 Model Year Engines	25
Table VIII-4: Proposed Optional Compliance Schedule for Small Trailer Fleets of 2010 and Earlier Model Year 53-foot or Longer Box-Type Trailers	25
Table VIII-5: Refrigerated Fleet Compliance Deadlines	26
Table IX-1: U.S. EPA Certified SmartWay Tractors	33
Table IX-2: Fuel Savings Ranges for Trailer Aerodynamic Devices (Freight Wing, 2007; Laydon, 2007; Surcel, 2007a; Surcel, 2007b)	38
Table IX-3: Comparison of Tire Rolling Resistance Coefficients	43
Table X-1: Alternative Regulatory Structures Considered	47
Table XI-1: Fuel Efficiency Improvements - Based on Proposed Requirements	54
Table XI-2: 2010, 2015, and 2020 GHG Emission Benefits - Statewide and Nationwide (MMT CO ₂ e)	55
Table XII-1: Tractor and Trailer Costs	60
Table XII-2: Annual Maintenance Costs/Fees	61

Table XII-3: Annual Operating Cost Savings	62
Table XII-4: Owner-Operator Compliance Costs	64
Table XII-5: Fiscal Year Costs for State Agencies	65
Table XII-6: Average Annualized Cost Savings	66

Table of Contents (cont.)

List of Figures	<u>Page</u>
Figure V-1: Box-Type Trailers	10
Figure VI-1: California GHG Emissions by Sector - 2002-2004 Average (ARB, 2008b)	16
Figure VI-2: Transportation Sector GHG Emissions - 2002-2004 Average (179 MMTC02e) (ARB, 2008b)	17
Figure IX-1: SmartWay Tractors	31
Figure IX-2: Trailer Side Skirts	35
Figure IX-3: Adamworks Aeromax Retractable Fairing	36
Figure IX-4: Front Trailer Gap Fairings	37
Figure IX-5: Rear Trailer Fairings	38
Figure IX-6: Contributors to Rolling Resistance (Michelin, 2002)	44
Figure XI-1: Statewide GHG Emissions With and Without the Regulation	55

EXECUTIVE SUMMARY

The State of California has traditionally been a pioneer in efforts to reduce air pollution, dating back to 1963 when the California New Motor Vehicle Pollution Control Board adopted the nation's first motor vehicle emission standards. In 2004, ARB continued its tradition of leadership with the adoption of the first greenhouse gas (GHG) emission reduction measure in the nation, applicable to light-duty vehicles. The staff proposal presented in this Initial Statement of Reasons reduces GHG emissions from another category of motor vehicles that substantially contributes to human GHG emissions: heavy-duty vehicles (HDVs).

Climate Change Overview

While the Earth's natural climate is dynamic and constantly changing, the climate change observed over the last one-and-one-half centuries seems to differ in both its rate and its magnitude. Many sources of data indicate that the Earth is warming faster than at any time in the last millennium. For example, 11 of the last 12 years from 1995 to 2006 rank among the 12 warmest years in instrumental record of global surface temperatures (IPCC, 2007). As the global mean surface temperature increases, significant adverse effects may be observed: decreased water supply, higher sea levels, changed agricultural patterns, altered ecosystems, and worse air quality.'

Global temperatures have been linked to the GHG effect, where certain gases in the lower atmosphere absorb radiation released by the Earth's surface that was heated by solar radiation. While the GHG effect is important in maintaining the temperature of the Earth's lower atmosphere, the addition of more GHG emissions into the atmosphere due to human activities may be causing the increase in the average global ambient temperature. Burning of fossil fuels, agriculture, use of refrigeration systems, and other human activities release GHG emissions.

The transportation sector is the largest contributor of human GHG emissions in California: 38 percent of total carbon dioxide equivalent (CO₂e) emissions in 2004. Of this sector, the largest contributing category was that of passenger vehicles at 74 percent of the total transportation CO₂e emissions. The second largest contributing category was that of HDVs, responsible for 20 percent of the total transportation emissions.

Regulatory Authority

The California Global Warming Solutions Act of 2006 (AB 32) established requirements for a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, and cost-effective reductions of GHG emissions. AB 32 gave ARB responsibility for monitoring and reducing GHG emissions. It requires ARB and other state agencies to adopt regulations and other requirements that would reduce, by 2020, statewide GHG emission levels to the equivalent of 1990 levels. This represents a

reduction of about 25 percent. Further, by Executive Order the Governor has directed that GHG emission levels be reduced to 80 percent below 1990 levels by 2050. The 2020 goal establishes an aggressive, but achievable, mid-term target, and the 2050 goal represents the level scientists believe is necessary to reach in order to stabilize the climate.

To swiftly address GHG reductions in the near-term, AB 32 also directs ARB to identify a list of early action measures to be adopted by the Board and made enforceable by January 1, 2010. In 2007, the Board identified 44 early action measures, consisting of potential regulations affecting motor vehicles, fuels, refrigerant in cars, and many other sources. Included were nine discrete early action measures for which the Board would adopt regulations by the end of 2009. The proposed Heavy-Duty Vehicle Greenhouse Gas Emission Reduction Regulation is one of the nine discrete early action measures.

Federal SmartWay Partnership Program

The proposed regulation references a federal voluntary program called the United States Environmental Protection Agency (U.S. EPA) SmartWay Partnership Program. The U.S. EPA SmartWay Partnership Program aims to improve energy efficiency, reduce GHG and air pollutant emissions, and improve energy security of the ground freight movement system. Under the SmartWay program, U.S. EPA certifies tractors and trailers that have been demonstrated to be more fuel efficient than their traditional counterparts. At this time, there are SmartWay specifications for tractors with sleeper cabs and for 53-foot or longer dry-van trailers, and therefore, only these products can be certified by original equipment manufacturers under the SmartWay program. The SmartWay program also approves individual aerodynamic equipment for trailers and efficient (low-rolling resistance) tires for tractors and trailers.

Regulatory Proposal

The proposed regulation reduces GHG emissions by improving long-haul HDV fuel efficiency. A more efficient HDV uses less fuel, and as a result, emits less GHG emissions. A HDV consists of a heavy-duty tractor (tractor), and a trailer. The proposed regulation requires new and existing long-haul on-road tractors pulling 53-foot or longer box-type trailers and 53-foot and longer box-type trailers pulled by tractors, which operate on California highways, to be equipped with SmartWay approved aerodynamic technologies and low-rolling resistance tires. For purposes of the proposed regulation, a box-type trailer is a dry-van trailer or a refrigerated-van trailer. The proposed regulation does not apply to tractors pulling other types of trailers, e.g., box-type trailers of lengths shorter than 53 feet, or to tractors pulling flatbeds, or logging trailers, drop-frame trailers, curtain-side trailers, or chassis trailers hauling shipping containers. Also exempt from the requirements of the regulation are authorized emergency vehicles and military tactical support vehicles, as well as short-haul and drayage tractors, as defined in the proposal.

Proposed Requirements for Tractors

Beginning January 1, 2010, a 2011 and subsequent model year tractor with a sleeper berth that pulls a 53-foot or longer box-type trailer on a California highway would be required to be a U.S. EPA certified SmartWay tractor. As noted previously, SmartWay does not currently certify a tractor without a sleeper berth, Le., day cab, and thus, these tractors would not be required to be SmartWay certified. In addition, low-rolling resistance tires that meet U.S. EPA SmartWay specifications would be required beginning January 1, 2010, for a 2011 and subsequent model year tractor regardless of whether it has a sleeper berth or not.

Beginning January 1, 2012, a 2010 and earlier model year tractor with or without a sleeper berth that pulls a 53-foot or longer box-type trailer on a California highway would be required to be equipped with low-rolling resistance tires. This would be the only retrofit requirement for these tractors, and allows most 2010 or earlier model year tractors to use their existing tires for the remainder of their useful life before replacing them with low-rolling resistance tires.

Proposed Requirements for Trailers

Beginning on January 1, 2010, a 2011 and newer 53-foot or longer box-type trailer pulled by a tractor on a California highway would be required to be either (1) a U.S. EPA certified SmartWay trailer or (2) retrofitted with SmartWay approved technologies. The first option, to use a U.S. EPA certified SmartWay trailer, is currently only available for dry-van trailer applications. U.S. EPA has defined specifications for this type of trailer, and several manufacturers have already certified models. For refrigerated-van trailers, the second option, to retrofit with SmartWay approved technologies, would be the available compliance approach. In the future, the SmartWay program may expand to cover refrigerated trailers, as well as other types of trailers, potentially making the first option (above) available for refrigerated trailers.

2010 and earlier model year 53-foot or longer box-type trailers that will be pulled by tractors on California highways would be required to be retrofitted with SmartWay approved technologies by January 1, 2013. The retrofit requirements would be identical to the second option for 2011 and subsequent model year trailers, described above. In lieu of meeting the January 1, 2013 compliance date, the trailer owner could choose to comply with an optional trailer fleet compliance schedule only if it meets the following conditions: (1) submits a compliance plan by the due date, (2) meets its annual commitments for retrofitting trailers, and (3) allows ARB to audit records periodically.

There are two proposed optional trailer fleet compliance schedules that would be based on trailer fleet size: the large fleet compliance schedule and the small fleet compliance schedule. The large fleet compliance schedule would apply to fleets with 21 and greater trailers. A six year phase-in is proposed for large fleets, with the first compliance year starting in 2010 and the last compliance year ending in 2015. For added flexibility, a trailer owner could participate in an early compliance option, in which credit is given for 2010 and earlier model year box-type trailer that are compliant by December 31, 2009. The early compliance credit could be used to delay the retrofit of some affected trailers until 2016.

The small fleet compliance schedule would apply to trailer fleets with 1 to 20 trailers. Compliance would be delayed, beginning in **2013** and completed in 2016.

Also proposed is a delayed compliance provision for refrigerated-van fleets. This provision would apply to 2003 to 2008 model year refrigerated-van trailers equipped with diesel-fueled transport refrigeration units (TRUs). The flexibility proposed for TRUs is because owners of these vehicles will be subjected to another ARB regulation, called the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units and TRU Generator Sets, and Facilities Where TRUs Operate (TRU Rule), which will require replacement or retrofit of the TRU concurrent with the proposed optional compliance schedules. A three year compliance schedule is proposed for these trailers with the first compliance year starting in 2017 and the last compliance year ending in 2019.

Requirements for the Owners, Drivers, Motor Carriers, California-based Brokers, and California-based Shippers

The proposed regulation would establish the following requirements for each of the parties listed below. A notice of violation would be issued to each of the parties listed below if a tractor or trailer subject to the proposed regulation is found to be noncompliant.

- Owners of tractors pulling 53-foot or longer box-type trailers on California highways: Tractor owners would be responsible to ensure that the tractors subject to the proposed regulation comply with the proposed requirements within the proposed compliance schedule. Owners would also need to ensure that aerodynamic devices, if applicable, and low-rolling resistance tires are used and maintained in good operating condition. This would ensure that the SmartWay components are operating as designed.
- Owners of 53-foot or longer box-type trailers pulled by tractors on California highways: Like owners of tractors subject to the proposed regulation, trailer owners would be responsible for ensuring that the applicable trailers comply with the proposed requirements within the proposed compliance schedule, as well as ensuring that the equipment is maintained in good operating condition. Owners of affected trailers would also be required to submit information to ARB if they choose to participate in an optional compliance schedule.
- Drivers of tractors pulling 53-foot or longer box-type trailers on California highways: Drivers would be responsible for ensuring that tractors and trailers to be driven are in compliance with the proposed regulation and meet the proposed good operating condition criteria.
- Motor carriers and California-based brokers that dispatch tractors pulling 53-foot or longer box-type trailers on California highways: Motor carriers and California-based brokers would be responsible for ensuring that the tractors and trailers they dispatch to pick up freight comply with the proposed regulatory requirements.

- California-based shippers that ship freight in 53-foot or longer box-type trailers pulled by tractors on California highways: Shippers would be responsible for ensuring that any freight being picked up at their facility is done so only by compliant tractors and trailers.

Enforcement

ARB enforcement staff would enforce the requirements of the proposed regulation as follows:

- Drivers, owners of tractors and trailers, and motor carriers could receive penalties upon issuance of a notice of violation (NOV) as determined at roadside inspection locations, facility inspections, and audits.
- California-based brokers and California-based shippers would be notified of motor carriers and tractor trailer owners that they have contracted with, that have failed to settle previously issued NOVs. The purpose of this notification would be to give them the opportunity to take the necessary actions to prevent future violations'. If, however, ARB enforcement staff finds that the California-based broker or shipper continues to use delinquent motor carriers, tractor owners, or trailer owners, the California-based broker or shipper could be subject to penalties.

Environmental Impact

The statewide GHG emission benefits of the proposed regulation are projected to be 1.0 million metric tons (MMT) of CO₂-equivalent (CO₂e) emissions in 2020. Reductions of GHG emissions would extend beyond the California state borders as California interstate trucks that travel outside California and out-of-state trucks that travel onto California highways are subjected to the proposed regulation. Nationwide benefits of the proposed regulation are projected to be 6.7 MMT of CO₂e emissions in 2020. From 2010 to 2020, the cumulative GHG emission benefits are estimated to be approximately 7.8 MMT CO₂e statewide and 52.1 MMT CO₂e nationwide.

In addition to GHG benefits, reducing aerodynamic drag and rolling resistance will also reduce NOx emissions. Statewide NOx emission reductions are projected to be 4.3 and 1.4 tons per day in 2014 and 2020, respectively.

Economic Impact

The proposed regulation would **impact** trucking businesses that own tractors and 53-foot or longer box-type trailers subject to the proposed regulation. While compliance with the proposed regulation would require an initial capital cost, it is expected that a cost savings would ultimately result due to the increase in HDV fuel efficiency and the resultant usage of less fuel. The average estimated cost increase for the purchase of a SmartWay certified tractor equipped with aerodynamic devices and low-rolling resistance tires is \$2,100 per tractor. The estimated average cost of trailer compliance

for the initial purchase and installation of aerodynamic technologies and low-rolling resistance tires is approximately \$2,900 per trailer. In addition, annual maintenance costs for inspection and repair of installed aerodynamic technologies, and replacement and retread costs for low-rolling resistance tires, is estimated to be about \$143 for the tractor and \$120 for the trailer. Therefore, the initial capital cost for a tractor-trailer combination would average about \$5,000, with an annual increased maintenance cost of \$263. However, the industry average trailer-to-tractor ratio is estimated to be 2.5-to-1 per owner. This translates into an average cost of \$9,200 per owner.

Operating cost savings resulting from the fuel efficiency improvement of compliant tractors and trailers are anticipated to be substantial. A tractor-trailer combination that complies with the proposed regulation is expected to realize a 7 to 10 percent fuel economy gain, depending on the types of tractor and trailer improvements. Assuming this range, the fuel savings would be approximately \$4,000 to \$5,700 per year for a tractor-trailer combination.¹ The fuel savings due to the proposed requirements would allow the owner to recover the initial capital and maintenance costs for both the tractor and trailer in less than 1.5 years. If an owner had more trailers than tractors, i.e., a trailer-to-tractor ratio of more than one, it would require additional time for the payback of the initial capital costs. Businesses that are required to equip trailers with aerodynamic technologies and low-rolling resistance tires but do not own or operate tractors (including owners of trailer fleets and certain shippers) may not directly recoup initial costs if they do not directly pay for fuel. However, staff anticipates that at least some of the fuel savings from trailers equipped with SmartWay devices and tires will be indirectly shared by trailer owners through price structures that reflect fuel savings associated with these trailers.

The total estimated lifetime equipment cost of complying with the proposed regulation is about \$10.4 billion. However, over the same period of time, the total estimated cost (fuel) savings are about \$14.7 billion. Therefore, a net savings of approximately \$4.3 billion in 2008 dollar values is expected. The total estimated statewide lifetime cost of complying for California based tractors and trailers is about \$0.5 billion and the cost savings over the same period of time are \$1.1 billion. This yields a net statewide cost savings of almost \$0.6 billion. This net cost savings would be realized by fleet operators and owner-operators of compliant tractors and trailers and are directly attributed to operating cost savings associated with improved fuel economy.

Some financial assistance and grant programs are available to aid tractor and trailer owners in complying with the proposed requirements. These programs are available through the federal, state, and local governments; they provide technical assistance, loans for the purchase of fuel savings and emissions reducing vehicles and technologies, and grants to assist eligible partners to adopt diesel emissions reduction

¹ The assumptions for this calculation are as follows: a baseline fuel economy of 5.8 miles per gallon, an average long-haul mileage accrual rate of 125,000 miles per year, 84 percent of the vehicle miles traveled at highway speed benefit fully from the aerodynamic devices, and a projected diesel fuel cost of \$3.14 per gallon. If the cost per gallon in diesel fuel is higher than \$3.14, the fuel savings due to the proposed regulation would be proportionately greater.

strategies. In particular, in California, \$48 million has been appropriated to fund a heavy-duty vehicle air quality loan guarantee program (anticipated loan values of \$300 million) to encourage early compliance by on-road fleets affected by this proposed regulation and the proposed In-Use Truck and Bus Regulation (particulate matter and NOx reduction). In developing this air quality loan program, ARB staff is currently coordinating with the State Treasurer's Office and private sector banks to tailor a program to meet the specific needs of the heavy-duty vehicle sector.

Staff Recommendation

ARB staff recommends that the Board adopt the regulation as proposed in the Initial Statement of Reasons. The proposed regulation is intended to achieve feasible and cost-effective GHG emissions from HDVs.

I. INTRODUCTION AND OVERVIEW

A. Introduction

The mission of the California Air Resources Board (ARB or Board) is to protect public health, welfare, and ecological resources through the effective and efficient reduction of air pollutants, while recognizing and considering the effects on the economy of the State (ARB, 2002). ARB's vision is that all individuals in California, especially children and the elderly, can live in a healthful environment - free from harmful exposure and the effects of air pollution. To this end, staff is proposing a regulation to reduce greenhouse gas (GHG) emissions from long-haul heavy-duty vehicles (HDVs). These HDVs are commonly used for freight transport and consist of a heavy-duty tractor (tractor), and a trailer. The proposed regulation affects 53-foot or longer box-type trailers and the tractors that pull them, when operating on California highways.

B. Overview

The proposed regulation would reduce GHG emissions by requiring new and existing on-road tractors and trailers to be equipped with technologies that improve fuel efficiency and reduce GHG and oxides of nitrogen (NOx) emissions, when operating on California highways. The proposed regulation references a federal voluntary program, called the United States Environmental Protection Agency (U.S. EPA) SmartWay Transport Partnership, which is designed to improve the environmental performance associated with the overall ground freight delivery system in the United States. In particular, the program "certifies" or approves technologies, such as aerodynamic equipment and low-rolling resistance tires that reduce GHG emissions and improve fuel efficiency of HDVs. Currently, the federal program is limited to HDVs equipped with sleeping berths pulling 53-foot and longer box-type trailers.

The proposal would require the use of aerodynamic equipment and low-rolling resistance tires beginning January 1, 2010. Certain types of HDVs will be exempted from the proposed regulatory requirements, including short-haul trucks and drayage trucks.

Compliance with these requirements would be mandatory for those parties that use the applicable tractor and trailer to transport freight, including the owner, driver, motor carrier, California-based broker, and California-based shipper. These requirements would pertain to all applicable tractors and trailers that operate on California highways regardless of where the vehicles are domiciled.

The statewide GHG emission benefits of the proposed regulation are projected to be 1.0 million metric tons of carbon dioxide equivalent (MMT CO_{2e})² emissions in 2020. In

² Carbon dioxide equivalent (CO_{2e}) is a metric measure used to compare the emissions from various GHGs based upon their global warming potential. Global warming potential (GWP) is the index used to translate the *level* of emissions of *various* gases into a common measure in order to compare the relative *radiative* forcing of different gases without directly calculating the changes in atmospheric concentrations. GWPs are calculated as the ratio of the radiative forcing that would result from the emissions of one kilogram of a GHG to that from

addition to GHG benefits, reducing aerodynamic drag and rolling resistance will also reduce NO_x emissions. Statewide NO_x emission reductions are projected to be 4.3 and 1.4 tons per day in 2014 and 2020, respectively.

The proposed regulation would impact trucking businesses that own tractors and 53-foot or longer box-type trailers subject to the proposed regulation. While compliance with the proposed regulation would require an initial up-front capital cost, fuel savings will more than offset the initial cost. The initial capital cost for a tractor-trailer combination would average about \$5,000 with an annual increased maintenance cost of \$263.

Operating cost savings resulting from the fuel efficiency improvement of compliant tractors and trailers is anticipated to be substantial. Fuel savings for a compliant tractor-trailer combination are expected to be 7 to 10 percent. Thus, fuel savings would be approximately \$4,000 to \$5,700 per year.³ The fuel savings due to the proposed requirements would allow the owner to recover the initial capital and maintenance costs for both the tractor and trailer in less than 1.5 years. If an owner had more trailers than tractors, i.e., a trailer to tractor ratio of more than one, it would require additional time for the payback of the initial capital costs. Owners of only trailers would not benefit directly from fuel savings.

The total estimated statewide lifetime cost of complying with the proposed regulation is about \$10.4 billion. However, over the same period of time, the total estimated fuel cost savings is about \$14.7 billion. Therefore, a net savings of approximately \$4.3 billion in 2008 dollar values is expected.

II. REGULATORY AUTHORITY

A. Summary of Regulatory Authority

California first addressed climate change in 1988 with the passage of AB 4420 directing the California Energy Commission, in consultation with ARB and other agencies, to study global warming impacts to the state and develop an inventory of GHG emission sources. Since then, many other pieces of legislation have been passed to continue to research global warming impacts, to establish and update GHG emission inventories, and to develop mitigation efforts. In particular, AB 1493, signed on July 22, 2002, required ARB to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of GHGs from light-duty vehicles. This resulted in the first

emission of one kilogram of CO₂ over a period of time (usually 100 years). For example, the GWP of CO₂, methane, and nitrous oxide is 1, 21, and 310, respectively. CO₂ equivalents are commonly expressed as "million metric tons of carbon dioxide equivalents (MMT CO₂e)".

³ The assumptions for this calculation are as follows: a baseline fuel economy of 5.8 miles per gallon, an average long-haul mileage accrual rate of 125,000 miles per year, 84 percent of the vehicle miles traveled at highway speed benefit fully from the aerodynamic devices, and a projected diesel fuel cost of \$3.14 per gallon. If the cost per gallon of diesel fuel is higher than \$3.14, the fuel savings due to the proposed regulation would be proportionately greater.

regulation in the nation, adopted by ARB in September 2004, to control GHG emissions from motor vehicles;

In 2006, the California Global Warming Solutions Act of 2006 (AB 32) was signed into law, creating a comprehensive, multi-year program to reduce GHG emissions in California (Nunez, 2002). It calls for the reduction of GHG emissions to 1990 levels by the year 2020, a reduction of about 25 percent. In addition, the Governor issued an Executive Order directing state agencies to reduce GHG emissions to 80 percent below 1990 levels by 2050. The 2020 goal establishes an aggressive, but achievable, mid-term target, while the 2050 goal represents the level scientists believe must be reached in order to stabilize the climate.

To swiftly address GHG reductions in the near-term, one requirement of AB 32 directed ARB to identify a list of early action measures that could be adopted by the Board by January 1, 2011. In 2007, the Board identified 44 such early action measures including potential regulations affecting motor vehicles, fuels, refrigerant in cars, and many other sources, including nine "discrete" early action measures, which would be adopted and enforceable by January 1, 2010 (ARB, 2007). The proposed Heavy-Duty Vehicle Greenhouse Gas Emission Reduction Measure is one of these discrete early action measures.

III. PUBLIC OUTREACH AND ENVIRONMENTAL JUSTICE

A. Public Outreach Efforts

During the development of the regulatory proposal, ARB staff conducted numerous outreach efforts to inform affected parties of the proposal and to obtain stakeholder comments. Outreach efforts included public workshops, individual meetings, and email and telephone contacts.

1. *Public Workshops*

Three separate series of workshops were conducted jointly with another regulatory proposal, the In-use On-road Heavy-duty Diesel-fueled Vehicle Regulation (Truck and Bus Rule). The first series, held in January and February 2008, consisted of ten workshops in eight locations throughout California. The second series, held in May and June 2008, included twelve workshops in eight California locations. The third series, held in July and August 2008, included eleven workshops in eight locations throughout California. In addition, staff conducted two series of independent workshops focused exclusively on the proposed regulation, one in June 2008 and the other in July and August 2008. Table 111-1 provides a listing of the dates, times and locations of the workshops.

Table 111-1: Public Workshop Dates, Locations and Times

Date	Location	Time
January 28, 2008	Sacramento	Day

January 30; 2008	Fresno	Day
January 31,2008	El Monte	Day
January 31 , 2008	Riverside	Evening
February 4, 2008	San Diego	Day
February 4, 2008	El Centro	Evening
February 6, 2008	Redding	Day
February 6, 2008	Redding	Evening
February 11, 2008	Berkeley	Day
February 11, 2008	Berkeley	Evening
May 21,2008	El Monte	Day
May 27,2008	San Diego	Day
May 27, 2008	El Centro	Evening
May 29, 2008	Riverside	Evening
May 30,2008	San Jose	Day
May 30,2008	San Jose	Evening
June 2,2008	Redding	Day
June 2,2008	Redding	Evening
June 4,2008	Sacramento	Day
June 4,2008	Sacramento	Evening
June 10, 2008	Fresno	Day
June 10, 2008	Fresno	Evening
July 22, 2008	San Diego	Day
July 22, 2008	El Centro	Evening
July 24, 2008	El Monte	Day
July 28, 2008	Redding	Day
July 28, 2008	Redding	Evening
July 30, 2008	San Jose	Day
July 30, 2008	San Jose	Evening
July 31,2008	Sacramento	Day
August 4, 2008	Riverside	Evening
August 5,2008	Fresno	Day
August 5, 2008	Arvin	Evening
June 6, 2008	Sacramento	Day
June 12, 2008	El Monte	Day
June 13, 2008	San Diego	Day
July 28, 2008	Sacramento	Day
July 29, 2008	San Diego/Otay Mesa	Day
August 5, 2008	El Monte	Day

In order to ensure that Spanish-speaking stakeholders, particularly those involved in commerce at the U.S.-Mexican border, were able to understand the proposal and provide their comments, the draft regulation and presentation documents were translated into Spanish. In addition, the public workshop held in San Diego/Otay Mesa on July 29,2008, was conducted with Spanish interpreters. Efforts to reach the

attendees to inform them about the upcoming workshop included distributing flyers translated into Spanish at a California Highway Patrol border-crossing facility and through the Otay Mesa Chamber of Commerce (See Appendix B).

2. Individual Meetings

ARB staff conducted several presentations and off-site meetings targeted at specific stakeholder groups to inform them about the proposed regulation and obtain their participation and feedback in the process. These presentations were given at the following locations or events:

Table 111-2: Presentations

Date	Organization/Event
June 9, 2008	Greening the Supply Chain Conference
July 17, 2008	Distribution Management Association - Inland Empire Chapter
August 6, 2008	International Warehouse Logistics Association
July 30, 2008	Otay Mesa Chamber of Commerce
September 12, 2008	Ralphs Grocery Distribution Center
September 18, 2008	Los Angeles area logistics facilities tour

3. Other Outreach

Staff contacted more than 60 industry associations, representing the trucking, logistics, manufacturing, wholesale, and retail industries, as well as individual industry members, to inform them of the proposal and invite them to provide comments. Staff also met with various stakeholders individually to gather information, to discuss the proposed requirements, and to discuss issues of concern. These stakeholders included motor carriers, the trucking industry, warehouse and logistics companies, and equipment manufacturers. Staff met with manufacturers of trailer aerodynamic technologies and manufacturers of low-rolling resistance tires to understand their product offerings, as well as with managers of fleets in the U.S. and Canada that currently use the types of aerodynamic devices required by this regulation, to gain first-hand knowledge of their experiences with the equipment. Summaries of fleet meetings can be found in Appendix E. Table 111-3 provides a list of the various associations, companies, and other organizations contacted.

Table 111-3: Associations, Companies and Other Organizations Contacted

ACT Research	AdamWorks Inc.
ADS Logistics LLC	Advance Auto Parts
Advanced Logistics & Distribution Systems	Affiliated Warehouse Companies
American Chain of Warehouses Inc	American Home Furnishings Alliance
American Logistics Association	American Supply Association

American Trucking Association (ATA)	American Wholesale Marketers Association
Appliance Parts Distributors Association (APDA)	Association of Home Appliance Manufacturers
AT Dynamics	B& B Trucking
Bakersfield Quality Distribution Center	Business Environmental Resource Center (BERC)
Best Buy Co. Inc.	Best Logistics Inc
Brent Redmond Transportation	Brockway Smith
Brookvale International Corp	Budway Trucking & Warehouse
Bureau of Home Furnishings	CA Manufacturers Technology Association
CA Retailers Association	CA Wholesale Marketers Assoc
Cal Chamber of Commerce	California Distribution Centers
California Furniture Manufacturers Association	California Grocers Association
California Trucking Association (CTA)	California Warehouse Association
Carry Transit	Cascade Drayage & Warehouse
Cascades	Coalition for Responsible Transportation
Containerization & Intermodal Institute (CII)	Cooperative Grocers- Information Network (CGIN)
Costco Wholesale	Council of Supply Chain Management Professionals
CVS Caremark	Daimler/Freightliner
Dependable Logistics Services	Distribution & LTL Carriers Association
Distribution Management Association	Environment Canada, Environmental Stewardship Branch
Falcon Transport	Food Industry Association Executives (FIAE)
Food Ingredient Distributors Association (FIDA)	Freight Wing
Global Cold Chain Alliance/International Assoc. of Refrigerated Warehouses	Great Dane
Hiner Transport	Home Depot
Hy-Vee foods	IKEA North America
Inland Cold Storage	Inland Empire Economic Partnership International
Intermodal Association of North America	International Society of Logistics
International Foodservice Distributors Association	JBHunt
International Warehouse Logistics Association (IWLA)	Kenworth
J-Line Transport	Longs Drug
Laydon Composites	Lowe's
Los Angeles Cold Storage Co	National Association of Wholesaler-Distributors
Mexican American Grocers Association	

National Association of Chain Drug Stores	National Association of Manufacturers
National Electronic Distributors Association	National Grocers Association
National Home Furnishings Association (NHFA)	National Motor Freight Traffic Association
National Private Truck Council	National Retail Federation
National Transportation & Logistics Association	New Century
Normandin Transport	North American Transportation Council
Nose Cone	OOIDA (Owner Operator Independent Drivers Assoc)
Otay Mesa Chamber of Commerce	PAFCO (Pacific American Fish Co, Inc)
Performance Warehouse Association (PWA)	PeterbiltPaccar
Private Label Manufacturers Association	Quest Global
Ralphs/Food 4 Less (Kroger)	Retail Industry Leaders Association (RILA)
Rite Aid	RL Jones Customhouse Brokers
Safeway Inc	Sandag
Schneider National, Inc	Sears Holdings
Secretaria del Medio Ambiente y Recursos Naturales (SEMARNAT)	Sherwin Williams
Silver Eagle Manufacturing Co.	Stater Bros Holdings Inc
Stockton Chamber of Commerce	Supervalu Inc (Albertsons)
Supply Chain & Logistics Association of Canada	Swift
Target Corp	Textile Rental Services Association
The National Customs Brokers & Forwarders Association of America	The National Industrial Transportation League
Toy Industry Association (TIA)	Toys R Us
Trailmobile	Trailwood Transport
Trans Am	Transload Distribution Association
Transportation Intermediaries Association	Transtex Composite
Truckload Carriers Association	Twin City
Unicold Corporation	US Customs border inspection facility Otay Mesa
US Growers Cold Storage Inc	US WTO, National Institute of Standards & Technology (NIST)
Utility Trailer	Van Eerden Trucking
Ventura Transfer Company	Volvo
Walgreens	Walmart
Warehouse Specialists Inc	Warehousing Education & Research Council
West Coast WarehousinQ	Western Home FurnishinQs Association,
Whole Foods Market Inc.	World Food Logistics OrQanization
Yandell Truckaway, Inc	Hendrickson Trucking

Tire Retread Information Bureau
Bridgestone Bandag Tire Solutions

Marangoni Retreading Systems

B. Environmental Justice

As a matter of policy, ARB is committed to integrating environmental justice in all of its activities. On December 13, 2001, the Board approved Environmental Justice Policies and Actions (Policies), which formally established a framework for incorporating environmental justice into the ARB's programs, consistent with the directives of state law. Environmental justice is defined as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies (ARB, 2001). ARB recognizes its obligation to work closely with all stakeholders - communities, environmental and public health organizations, industry, business owners, other agencies and all other interested parties - to successfully implement these Policies. These Policies apply to all communities in California, but recognize that environmental justice issues have been raised more in the context of low-income and minority communities.

The proposed regulation would benefit the people of California by reducing fuel consumption of tractors pulling 53-foot or longer box-type trailers throughout the state, and reducing emissions of GHGs and criteria pollutants in all communities throughout California, including those with environmental justice concerns.

IV. NEED FOR GREENHOUSE GAS EMISSION REDUCTIONS

Human, or anthropogenic, activities have altered the chemical composition of the atmosphere through the buildup of GHG emissions. Over the past century the Earth's northern hemisphere has warmed at a faster rate than at any other time over the last millennium. The potential impacts of a warming of the planet include: a rise in sea level, spread of certain diseases out of their usual geographic ranges, loss of agricultural production, decreased water supply, altering of ecosystems, increased strength and frequency of storms, extreme heat events, air pollution episodes, and the consequences of these effects on the economy. As a result, there is an urgent need to curtail GHG emissions from all anthropogenic sources where technologically feasible and economically practicable. (IPPC, 2007; ARB, 2004)

V. ON-ROAD VEHICLE DESCRIPTIONS

A. Overview

This chapter provides general background information on tractors and trailers, and describes the vehicles that will be subjected to the proposed regulation.

B. Heavy-duty Tractors

1. *Background*

An on-road tractor can pull anyone of a myriad of trailers to pick up and deliver freight. A **long-haul** tractor typically has three axles: a front, or steer, axle that uses two wheels, and two rear, or drive, axles that have double wheels on each side of the axle. Thus, a three-axle tractor may have ten wheels. A tractor may also have only two axles (a **steer** axle and drive axle), which is easier to maneuver in tight areas, but has less load-carrying capacity. Although dual wheels for the drive axles are the most common configuration, there is also limited use of single wide-base tires (also known as "super singles") on each end of an axle, due to their fuel economy benefits. A tractor is also equipped with a coupling known as a fifth wheel, which is used to join it with the trailer. Some tractors have a moveable fifth wheel, also called a slider, which can move forward or backward on the tractor frame. The slider helps distribute the weight of a loaded trailer more evenly between the tractor and trailer axles, in order to stay within federal axle weight limits and bridge laws.

Typically, a tractor that pulls a trailer for a long haul has a cab that is designed for driver comfort and will contain a roomy sleeping berth, or sleeper. A long-haul tractor that is pulling trailers will typically operate at highway speeds during the majority of its trip. Another type of tractor may be used for in-city deliveries and day trips where it may return daily to the location where it is garaged. These tractors are termed local or short haul. A short-haul tractor typically operates at city speeds, with some highway driving.

While HDV exhaust emissions have been regulated since 1973 in the United States, GHG emissions from HDVs are currently unregulated. However, recent voluntary efforts to increase fuel efficiency have reduced GHG emissions. For example, tractors have recently been designed with more aerodynamic features such as rounded rather than flat edges on the cab in order to reduce wind resistance. Some tractors have aerodynamic designs on the fuel tank, exhaust stack, and other protruding parts. These designs reduce aerodynamic drag, which, in turn, reduces needed engine power to propel the vehicle forward. Since there are, as yet, no regulatory requirements established to mandate aerodynamic features on tractors, the degree of aerodynamic improvement varies from manufacturer to manufacturer and within a manufacturer's own line of trucks.

2. *Tractor Manufacturers*

There are many manufacturers of tractors subject to the proposed regulation. They include Freightliner, Navistar International, Kenworth, Mack, Peterbilt, and Volvo Trucks. Some tractor manufacturers also manufacture engines for **their** tractors, but most manufacturers design vehicles to accept engines manufactured by other companies.

3. *Commercial Truck Classifications*

Commercial truck classifications are based on the vehicle's gross vehicle weight rating. The gross vehicle weight rating is the value specified by the manufacturer as the maximum design loaded weight of a single vehicle, which means the total weight of the

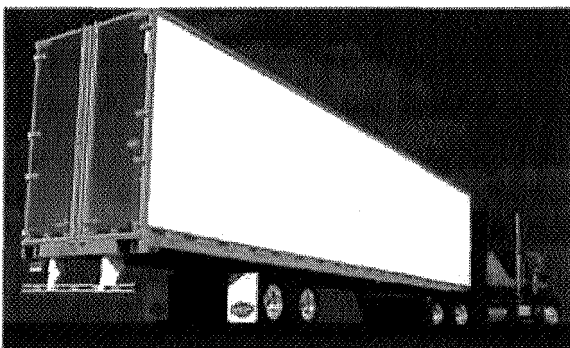
tractor and the trailer with freight. The proposed regulation applies only to Class 7 and 8 tractors. A Class 7 tractor has a gross vehicle weight rating of 26,001 to 33,000 pounds, and a Class 8 tractor is over 33,000 pounds gross vehicle weight rating. Most of the affected vehicles are Class 8 tractors.

C. Box-type Trailers

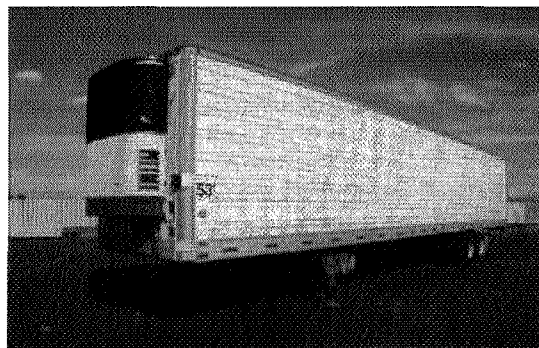
1. Background

There are many different types of trailers used on the road to carry freight. Most trailers have two axles, with dual wheels on each side of the axle, and thus have eight wheels. A trailer may be equipped with a moveable tandem axle, also called a slider, which mates with the fifth wheel of the tractor. Like the tractor's fifth wheel, the tandem axle can be moved forward or backward to more evenly distribute the weight of the loaded trailer between the tractor and trailer's axles and to meet bridge laws.

The most common type of trailer on the road is the box-type trailer, also called a van trailer. Types of box-type trailers include dry-van trailers and refrigerated-van trailers, also called reefers (see Figure V-1). A dry-van trailer, which hauls dry freight such as appliances, clothing, and furniture, does not require a temperature-controlled environment. A refrigerated-van trailer has a refrigeration or heating unit built into the trailer to maintain precise temperatures and is used to haul frozen food, fresh produce, hot or warm food, and other perishable items.



Dry...Van Trailer



Refrigerated- Van Trailer (Reefer)

. Figure V-1: Box-Type Trailers

Other common types of trailer designs include the curtain-side trailer, chassis trailer, drop-frame trailer, tanker, and flatbed trailer. The proposed regulation does not apply to these types of trailers. As with tractors, current trailer designs incorporate some aerodynamic features, such as rounded or tapered front corners and smooth, rather than ribbed sides, but the use of these features is inconsistent from manufacturer to manufacturer and from model to model.

2. *Trailer Manufacturers*

Manufacturers of 53-foot box-type trailers will be affected by the proposed regulation. These manufacturers include Utility Trailer Manufacturing Company, Wabash National Corporation, Great Dane Trailers, Trailmobile Corporation, Hyundai Translead, and other box-type trailer manufacturers.

VI. POPULATION AND GHG CONTRIBUTION FROM HEAVY-DUTY VEHICLES

A. Population

Assessing the number of tractors and trailers impacted by the rule was a challenge because the impacted tractors are a subset of the overall fleet and no complete database exists for trailers. Thus, as an example, for the tractors, staff had to take into account the percentage of total tractors that are long-haul, and of those, the number that pull 53-foot or longer box-type trailers. Staff's methodology and the assumptions used to determine the tractor and trailer population impacted by the proposal are discussed below. A variety of data sources were used to establish the tractor and trailer population impacted by the proposed rule. These include the following: ARB Motor Vehicle Emissions Inventory (ARB Inventory), U.S. Bureau of Census 2002 Vehicle Inventory and Use Survey (VIUS), Americas Commercial Transportation Research Company (ACT Research), U.S. Bureau of Census Current Industrial Reports (CIR), and Commercial Carrier Journal (CCJ). (See Appendix C for a more detailed description of these data sources.)

1. *Tractors*

Tractors impacted by the proposed regulation include Class 7 and 8 California-based intrastate and interstate tractors, and out-of-state-based tractors that operate in California. Staff used ARB's updated inventory (ARB, 2008a) as the basis for developing the tractor inventory affected by the proposed regulation. For purposes of this analysis, out-of-state-based Class 7 and 8 trucks operating in California and all California-based Class 7 and 8 interstate trucks are assumed to be tractors, since they are involved in interstate long-haul freight operation and as such generally use tractor-trailer combination trucks. Table VI-1 shows the projected total tractor population, both short-haul and long-haul, operating in California in 2010 and 2020 and the corresponding annual vehicle miles traveled (VMT).

Table VI-1: 2010 and 2020 Tractor Population and Annual VMT in California

Fleet	Class 7 & 8 Tractors		Annual VMT (10 ⁶ miles)	
	2010	2020	2010	2020
CA Intrastate	72,310	96,621	3,360	4,540
CA Interstate	62,292	83,927	2,673	3,611
Neighboring Out-of-State	43,278	58,275	1,274	1,721
Non-neighboring Out-of-State	469,323	626,853	3,935	5,316
Total	647,203	865,677	11,241	15,187

The population numbers shown in Table VI-1 were adjusted to differentiate long-haul from short-haul tractors that pull any size box-type trailer. Staff used the 2002 VIUS data to determine the long-haul fraction for California intrastate, interstate, and neighboring out-of-state fleets (Census, 2002). Specifically, the VIUS data provided staff with information on (1) the primary range of operation (to determine the percentage of vehicles with a primary range of operation greater than 100 miles), and (2) jurisdiction in which the vehicle was most driven (to determine whether fleets operate interstate or exclusively intrastate). As shown in Table VI-2, this information was used by staff to conclude that 23 percent of California's intrastate tractors and 71 percent of California's interstate tractors operate long-haul. For out-of-state registered tractors, 69 percent of tractors registered in neighboring states are affected. For the purpose of this proposal, a range of more than 100 miles from their home base would classify these tractors as long-haul. It is assumed that all tractors from non-neighboring states travel more than 100 miles, resulting in the long-haul population percentage for this category equal to 100 percent.

Table VI-2: Percentage of Tractors with Primary Range of Operation Greater than 100 Miles

Fleet	Percentage of Tractors with Primary Range of Operation > 100 Miles
CA Intrastate	23%
CA Interstate	71%
Neighboring Out-of-State	69%
Non-neighboring Out-of-State	100%

Table VI-2 gives the fraction of the tractor population with a primary range of operation greater than 100 miles. These percentages include all long-haul tractors that pull all types of trailers. However, because the proposed regulation applies only to long-haul tractors that pull 53-foot or longer box-type trailers, the percentages in Table VI-2 were further adjusted, as explained below.

To determine the percentage of box-type trailers that are 53-foot or longer, it was necessary to first assess what percentage of trailers sold each year are box-type. Staff analyzed trailer production data from the CIR report (Census, 2000), which showed that the percentage of box-type trailers sold each year from 1988 to 2000 varied from 70 to 77 percent with an overall average of 73 percent. As shown in Table VI-3, staff assumed that this average was appropriate for California intrastate, interstate, and neighboring out-of-state fleets operating in California. It was also assumed that since essentially all non-neighboring out-of-state tractors pull loads for greater distances, it would be appropriate to assume that more than 73 percent are box-type. Staff assumed that 90 percent of these tractors pull **box-type** trailers.

The next step, to determine the percentage of box-type trailers that are 53-foot or longer, staff consulted several trailer manufacturers and ACT Research.⁴ Two of the major trailer manufacturers indicated that approximately 90 percent or more of box-type trailers produced are 53-foot or longer trailers. Based on correspondence with ACT Research, 85 to 90 percent of refrigerated-van and dry-van trailers are 53-foot or longer (Vieth,2008). Therefore, as shown in Table VI-3, staff assumes that 85 percent of the box-type trailers pulled by California intrastate, interstate, and neighboring out-of-state tractors, and 90 percent of those pulled by non-neighboring out-of-state tractors are 53-foot or longer.

Table VI-3: Percentage of 53-Foot Box Type Trailers

Fleet	Percent Box-Type Trailers	Percent that are 53-foot or Longer
CA Intrastate	73	85
CA Interstate	73	85
Neighboring Out-of-State	73	85
Non-neighboring Out-of-State	90	90

Based on the total tractor population shown in Table VI-1 and the factors shown in Tables VI-2 and VI-3, staff estimated the tractor population impacted by the proposed regulation and the corresponding annual VMT, which is reflected in Table VI-4 for years 2010 and 2020.

⁴ ACT Research is a subscriber-funded research company that collects and analyzes commercial vehicle data from manufacturers.

Table VI-4: 2010 and 2020 Impacted Tractor Population and the Corresponding Annual VMT

Fleet	Impacted Tractor Population		Annual VMT (10 ⁶ miles)	
	2010	2020	2010	2020
CA Intrastate	9,547	12,910	705	952
CA Interstate	27,462	37,005	1,320	1,783
Neighboring Out-of-State	18,525	24,962	663	896
Non-neighboring Out-of-State	380,152	507,751	3,187	4,306
Total	435,686	582,628	5,875	7,937

2. Trailers

Available data were used to estimate the number of tractors that would be impacted by the proposed rule, as discussed above. For trailers, no database exists that provides a complete inventory on the total number of box-type trailers that would be impacted by the proposed rule. The ratio of trailers-to-tractors in many fleets is often not one-to-one (in which case the same numbers provided in Table VI-4 for tractors could have been used to estimate trailer inventory). The ratio varies considerably from fleet to fleet. Many fleets typically own more trailers than tractors in order to maximize efficiency and reduce downtime for the tractor while waiting for the trailer to be unloaded and loaded. The ratio varies from zero for some owner-operators that own only tractors and pull trailers owned by other businesses, to "infinity" for some shippers that own only trailers and use the services of carriers to pull their trailers. Since data describing the tractor-trailer composition of all fleets that operate in California were not available, staff determined an approximate trailer-to-tractor ratio using data from annual CCJ publications (Vise, 2007; Vise, 2008). The published data included the number of trailers and tractors owned by the top 250 carriers in the country in calendar years 2006 and 2007. Analysis of the two annual datasets provided an estimated ratio of 2.5-to-1 trailers to tractors for both years.

The number of box-type trailers impacted by the proposed rule was then estimated by multiplying the trailer-to-tractor ratio of 2.5 by the number of tractors impacted by the proposed rule shown in Table VI-4. Table VI-5 shows the resulting 53-foot box-type trailer population impacted by staff's proposal for calendar years 2010 and 2020.

Table VI-5: 2010 and 2020 Impacted 53-Foot Box-Type Trailers

Fleet	2010	2020
CA Intrastate	23,868	32,275
CA Interstate	68,655	92,513
Neighboring Out-of-State	46,313	62,405
Non-neighboring Out-of-State	950,380	1,269,378
Total	1,089,215	1,456,570

B. GHG Contribution

1. Overview, HDV Fleet

Figure VI-1 shows 2002 to 2004 average GHG emissions inventory broken down by sector (ARB, 2008b). As shown in the figure, the transportation sector, which includes on-road vehicles, aviation, rail, and ships, is the largest contributor to the total statewide GHG emissions inventory, producing approximately 38 percent of the state's total GHGs, or 179 MMT CO₂e. In 2020, GHG emissions from this sector are projected to increase by 25 percent (46 MMT CO₂e) relative to the 2002 to 2004 average and by 50 percent (75 MMT CO₂e) relative to 1990 levels, as shown in Table VI-6. Thus, emissions from the transportation sector must be significantly reduced in order to achieve the AB 32 requirement that State GHG emission levels be reduced to 1990 levels by the year 2020. Furthermore, as shown in Figure VI-2, on-road vehicle emissions account for more than 90 percent of the transportation emissions, with 74 percent from light-duty vehicles and 20 percent from on-road HDVs. This implies that most of the needed emission reductions from the transportation sector must come from on-road vehicles. The proposed regulation would therefore contribute towards achieving AB 32 goals by reducing emissions from on-road HDVs, and specifically from tractors that pull box-type trailers.

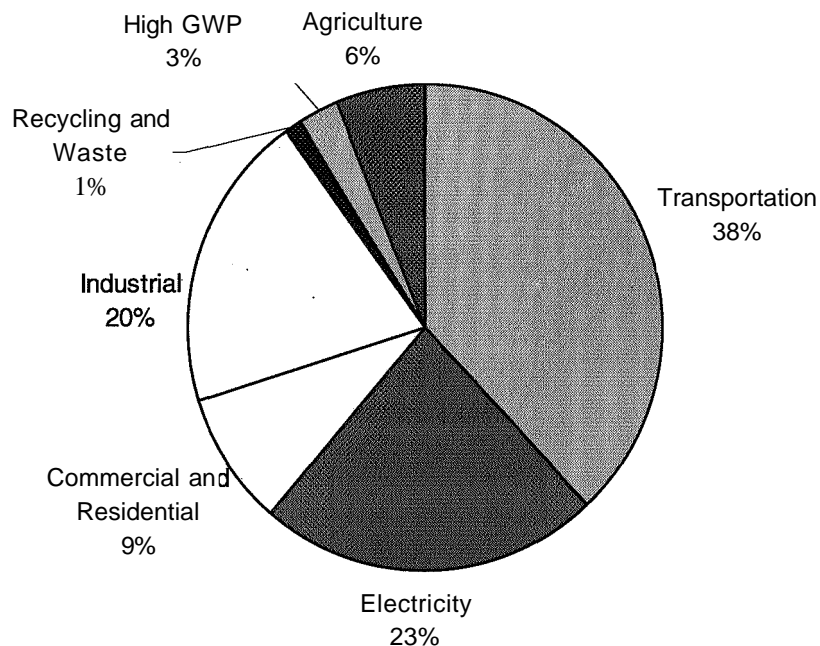


Figure VI-1: California GHG Emissions by Sector - 2002-2004 Average (ARB,2008b)

Table VI-6: 1990, 2002-2004 Average, and 2020 Projected Transportation Sector GHG Emissions (MMT CO₂e) (ARB, 2008b)

Fleet	Calendar Year		
	1990	2002-2004 Average Emissions	Projected 2020 Emissions (BAUI)
Passenger Vehicles	108.9	133.9	160.8
Heavy-duty Trucks	29.0	34.7	48.3
Ships & Commercial Boats	2.2	3.3	6.3
Aviation (Intrastate)	5.1	3.2	4.9
Rail	2.3	3.0	3.8
Unspecified	3.0	1.2	1.4
Emissions Total	150.7	179.3	225.4

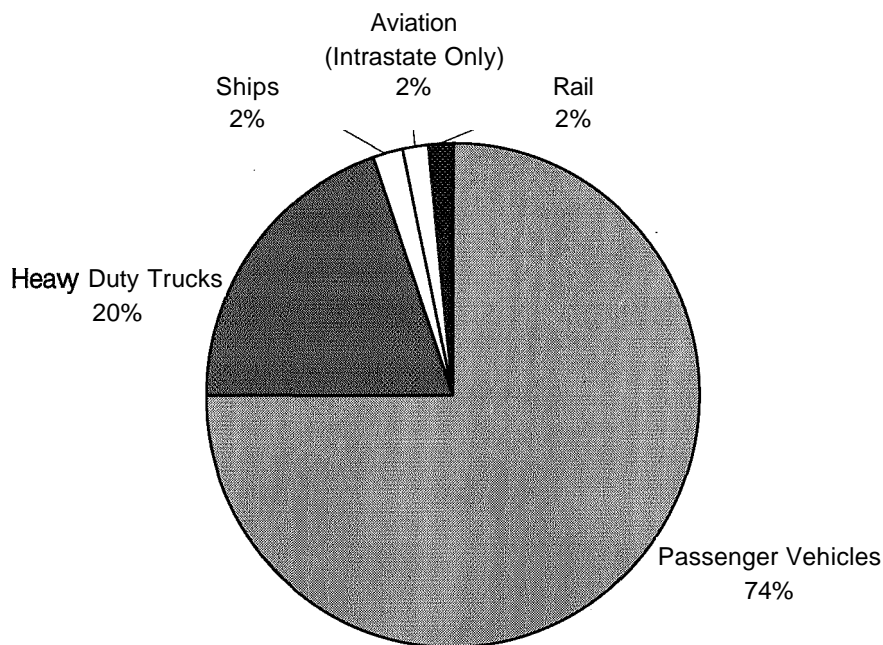


Figure VI-2: Transportation Sector GHG Emissions - 2002-2004 Average (179 MMTCO₂e) (ARB, 2008b)

2. Emissions Contribution of Impacted Tractor-trailers

Baseline GHG emissions for fleets impacted by the proposed regulation were estimated using the adjusted VMT shown in Table VI-4, an assumed fleet average fuel economy of 5.8 miles per gallon, and a GHG emission factor of 10.4 kilograms CO₂e per gallon of diesel fuel (ARB, 2008c). The baseline GHG emissions in California from long-haul tractors pulling box-type trailers are 8.5 MMT CO₂e in 2010 and 11 MMT CO₂e in 2020.

VII. U.S. EPA SMARTWAY TRANSPORT PARTNERSHIP

A. Description of Program

The SmartWay Transport Partnership (SmartWay) is a voluntary program developed by the United States Environmental Protection Agency (U.S. EPA) to reduce fuel consumption and emissions (criteria pollutant and GHG) resulting from the transportation of freight. The information presented in this chapter regarding the SmartWay program was acquired from a collection of references obtained from the U.S. EPA (see Appendix D). Through this program, freight industry companies enter into a partnership with U.S. EPA to implement strategies that improve their transportation efficiency. In return for their collaboration, U.S. EPA rewards these companies with certain market-based incentives, such as the privilege to advertise their SmartWay participation, business preference by other SmartWay partners, and for top-performers, the right to display the official SmartWay logo. U.S. EPA also continually promotes these partnerships in the public forum, which helps partners establish and maintain a

"green" image. Currently, the SmartWay program has more than 850 partners and aims to reduce oil consumption by as much as 150 million barrels per year, carbon dioxide emissions by as much as 66 million metric tons per year, and oxides of nitrogen emissions by as much as 200,000 tons per year by 2012.⁵

U.S. EPA developed SmartWay primarily for carriers (truck and rail), shippers, and logistics companies because of their influence on freight movement in the United States. By implementing strategies that improve transportation efficiency, these companies can earn performance points, the accumulation of which makes up their SmartWay score. This score serves three main purposes: it allows companies to monitor their environmental performance; it can be used as a marketing tool; and it can improve business opportunities, since contracting with other SmartWay partners increases the SmartWay scores of member businesses.

SmartWay carriers and trailer-operating shippers may use the following strategies to earn points:

- Reduce idle time
- Improve vehicle aerodynamics
- Improve freight logistics
- Use automatic tire inflation systems
- Use low-rolling resistance tires
- Implement driver training
- Use low-viscosity lubricants
- Reduce vehicle weight
- Reduce speed
- Use intermodal shipping
- Use hybrid powertrain technology
- Contract with other SmartWay partners

SmartWay shippers may also use the strategies listed below:

- Use intermodal shipping
- Provide preferential docking for SmartWay carriers
- Provide driver comfort stations
- Use electric forklifts
- Implement anti-idling policies
- Implement pickup/delivery scheduling
- Improve freight management to ensure full truckloads
- Improve efficiency of light fleet vehicles
- Improve warehouse efficiency
- Contract with other SmartWay partners

⁵ <http://www.epa.gov/smartway/swplan.htm> (July 10, 2008)

For logistics companies, scores are based solely on the SmartWay participation and scores of the carriers and shippers with whom they contract.

The option to earn points through the use of SmartWay partners encourages the industry as a whole to improve its environmental performance. Not only does a partner earn points for employing the services of another SmartWay partner, but more points are awarded for using partners with higher scores. Therefore, doing more in terms of improving efficiency, even if it requires additional investment, can actually serve as a business advantage.

Although some strategies listed in this section require upfront capital investment, SmartWay is expected to ultimately reduce the monetary cost of transportation as well as transportation's impact on the environment and public health.

B. SmartWay Tractors

Under the SmartWay program, U.S. EPA certifies tractors that have been demonstrated to use less fuel and produce lower emissions than their traditional counterparts. These tractors, which are designed to reduce aerodynamic drag, rolling resistance, and idle times, may be used to improve a partner's efficiency and SmartWay score. U.S. EPA developed the SmartWay tractor specifications in collaboration with the truck manufacturing industry and continues to update these specifications as technology advances. Several truck manufacturers currently offer U.S. EPA certified SmartWay tractors, including Freightliner, International, Kenworth, Mack, Peterbilt, and Volvo.

1. Technical Specifications and Requirements for SmartWay Tractors

To certify a tractor under the SmartWay program, a truck manufacturer must demonstrate to U.S. EPA that the tractor is equipped with the following:

- A 2007 or subsequent model year primary engine
- An integrated cab-high roof fairing
- Tractor-mounted side-fairing gap reducers
- Tractor fuel-tank side fairings
- Aerodynamic bumpers and mirrors
- An option for reducing extended idling
- Low-rolling resistance tires

Since tractors are typically designed from the ground up, retrofitting in-use tractors to meet SmartWay specifications is not practical. Therefore, in-use tractors are not considered for SmartWay certification. This is not the case for trailers, which will be explained in the following section. At this time, U.S. EPA only certifies tractors equipped with an integrated sleeper berth. However, they are currently developing specifications for day cab tractors as well.

C. SmartWay Trailers

Under the SmartWay program, carriers and shippers may use U.S. EPA certified SmartWay trailers to earn points. SmartWay trailers incorporate a number of the strategies listed in Section VII.A above, and are designed to meet specifications that emphasize improved fuel efficiency and reduced emissions. These specifications were developed collaboratively by U.S. EPA and the trailer manufacturing industry. At this time, U.S. EPA has only developed specifications for dry-van trailers, and therefore, only these trailers can be certified under the SmartWay program. Several trailer manufacturers currently offer U.S. EPA certified SmartWay trailers, including Great Dane, Hyundai Translead, Manac, Stoughton, Strick, Utility, and Wabash National.

To designate a trailer as a U.S. EPA certified SmartWay trailer, the trailer must either be equipped with the necessary SmartWay approved devices to meet U.S. EPA's design specifications, or be track tested for fuel consumption against a base trailer. This can be done by the original equipment manufacturers during manufacture, or it can be done on existing used trailers in the fleet.

The design specifications for a U.S. EPA certified SmartWay trailer currently require the following equipment:

- SmartWay approved side skirt fairings
- Either a SmartWay approved front-mounted trailer gap fairing or a SmartWay approved rear-mounted trailer fairing
- SmartWay approved low-rolling resistance tires

In order to demonstrate a trailer as a U.S. EPA certified SmartWay trailer through track testing, the testing must show that the trailer consumes at least 6.5% less fuel than a base trailer under similar drive and duty conditions. For this testing, the "SAE J1321, Type II" protocol⁶ must be used to measure fuel consumption.

VIII. PROPOSED REGULATION

A. Proposed Regulation Overview

The proposed regulation would reduce GHG emissions by requiring new and existing 53-foot or longer box-type trailers, and the tractors that pull them, to be equipped with SmartWay technologies when operating on California highways. The proposed regulatory language is contained in the new sections 95300 through 95312 of title 17, California Code of Regulations (see Appendix A of this report). The proposed requirements for both the tractors and trailers begin January 1, 2010. These requirements pertain to all applicable tractors and box-type trailers that operate on California highways regardless of where the vehicles are domiciled.

⁶ The SAE J1321, Type II test procedure does not specify any test parameters, such as environmental conditions, test design, load requirements, drive cycles, etc. Therefore, U.S. EPA reviews all test parameters before each test to ensure that testing is performed in a consistent manner.

B. Purpose

The purpose of the proposed regulation is to reduce GHG emissions from tractors that pull 53-foot or longer box-type trailers on California highways. GHG emissions would be reduced from these vehicles through the use of aerodynamic technologies and low-rolling resistance tires, which reduce aerodynamic drag and rolling resistance, respectively. This will result in the tractor requiring less energy to propel the vehicle forward, resulting in reduced fuel usage and GHG and NOx emissions.

C. Applicability

The proposed regulation applies to 53-foot or longer box-type trailers and the tractors that pull them when driven on California highways. The proposed tractor and trailer requirements apply to the owner, driver, motor carrier, California-based broker, and California-based shipper. The proposed regulation does not apply to tractors pulling other types of trailers, e.g., box-type trailers of lengths shorter than 53 feet, or to tractors pulling flatbeds, or logging trailers, drop-frame trailers, curtain-side trailers, or chassis trailers hauling shipping containers. Also exempt from the requirements of the regulation are authorized emergency vehicles and military tactical support vehicles, as well as short-haul and drayage tractors, as defined in the proposal.

D. Definitions

The proposed regulation contains many definitions to define and clarify the requirements. Only the key definitions are highlighted in this section. The full list of definitions can be found in the text of the proposed regulation, provided in Appendix A.

1. *Aerodynamic Technologies*

Aerodynamic technologies are devices designed to reduce wind resistance on the tractor or trailer that will improve overall vehicle fuel efficiency and reduce exhaust GHG emissions. Examples of such technologies for the tractor are fuel tank fairings, integrated cab roof fairings, and side extender fairings. Examples of trailer technologies are side skirts, front fairings, and rear (or boat tail) fairings.

2. *Parties Responsible for Compliance*

The parties responsible for compliance with the proposed regulation include the owner, driver, motor carrier, California-based broker, and California-based shipper. Each of these parties is defined here. The owner of a tractor or trailer is the person who legally holds the title of the vehicle or the lessee that has legal responsibility for registration and maintenance of the vehicle. The driver of a tractor is the operator of the tractor on a California highway. The motor carrier and the broker are the business intermediaries that contract with a person for pick-up and delivery of commercial freight, and either contract with tractor owners or, if a motor carrier, employs drivers of its own vehicles to pick-up or deliver freight. The shipper is the person or commercial operation that has possession of freight prior to its transportation, including, but not limited to, the owner of the freight, a distribution center, or a temporary freight storage facility. Only shippers

that are located in California are subject to the proposed requirements. When freight is shipped in a 53-foot or longer box-type trailer, each of the aforementioned parties would be responsible to ensure that both the tractor and the trailer are in compliance with the proposed requirements.

3. U.S. EPA SmartWay Partnership Program

The U.S. EPA SmartWay partnership program is a federal voluntary program aimed at improving energy efficiency, reducing GHG and air pollutant emissions, and improving energy security of the ground freight movement system. The SmartWay program certifies tractors and trailers that have the cleanest, most fuel-efficient equipment available. U.S. EPA certified SmartWay tractors and SmartWay trailers may be identified by the special certification mark on the inside of the tractor cab or trailer. U.S. EPA approved SmartWay aerodynamic devices for retrofitting non-SmartWay trailers are also identified through the SmartWay program. These devices meet the SmartWay technical specifications and requirements for improved fuel efficiency.

E. Requirements and Compliance Deadlines

1. Heavy-Duty Tractors

Different requirements would apply for tractors with sleeper berths and those without sleeper berths that pull 53-foot or longer box-type trailers on California highways (Table VIII-1). Beginning January 1, 2010, a 2011 and subsequent model year tractor with a sleeper berth would be required to be a U.S. EPA certified SmartWay tractor. A U.S. EPA certified SmartWay tractor typically has a high roof sleeper cab equipped with an integrated sleeper cab roof fairing, aerodynamic mirrors, an aerodynamic bumper, cab side extenders, fuel tank fairings, and low-rolling resistance tires. A description of tractor aerodynamic devices can be found in chapter IX, section A.2. SmartWay does not currently certify a tractor without a sleeper berth, i.e., day cab, and thus, these tractors are not included in the proposed regulation.

Low-rolling resistance tires that meet U.S. EPA SmartWay specifications would be required beginning January 1, 2010, for a 2011 and subsequent model year tractor regardless of whether it has a sleeper berth or not. 2010 and earlier model year tractors with or without sleeper berths would have additional time to comply with the low-rolling resistance tire requirements; it is proposed that they comply with these tire requirements by January 1, 2012. This flexibility minimizes waste and tire disposal issues by allowing most existing tires on the vehicle to be used for their normal useful life, and replaced with low-rolling resistance tires only when new tires are needed. Thus, by January 1, 2012, all tractors that pull 53-foot or longer trailers would have low-rolling resistance tires.

Table VIII-1: Proposed Tractor Requirements

Requirement	Model Year 2011 & Later Tractors with Sleeper Berths	Model Year 2011 & Later Tractors without Sleeper Berths	All Model Year 2010 and Earlier Tractors
SmartWay Certified Tractor	1/1/2010	Not Applicable	Not Applicable
SmartWay Approved low-rolling resistance tires	1/1/2010	1/1/2010	1/1/2012

2. Trailers

a) Requirements for 2011 and Subsequent Model Year Trailers

Beginning on January 1, 2010, a 2011 and subsequent model year 53-foot or longer box-type trailer pulled by a tractor on a California highway would be required to be either a U.S. EPA certified SmartWay trailer or retrofitted with SmartWay approved technologies (See Table VIII-2).

The first option, to use a U.S. EPA certified SmartWay trailer, is currently only available for dry-van trailer applications. The U.S. EPA has defined specifications for this type of trailer, and several manufacturers have already certified models. Certified dry-van trailers are equipped with side skirts, front trailer fairings, and low-rolling resistance tires. For refrigerated-van trailers, retrofitting with SmartWay approved technologies would be the only option for compliance. In the future, the SmartWay program may expand to certify refrigerated trailers, as well as other types of trailers, making this alternative available.

The second option, compliance by retrofitting with SmartWay approved aerodynamic and low-rolling resistance tire technologies, is available to both dry-van and refrigerated-van trailers. The proposed regulation would require dry-van trailers to use low-rolling resistance tires and either be retrofitted with (1) aerodynamic equipment that collectively meets or exceeds a 5 percent fuel savings in accordance with test requirements defined by the U.S. EPA SmartWay Partnership Program, or (2) side skirts plus a front fairing or rear trailer fairing that are SmartWay approved. This latter combination of aerodynamic devices has been certified by SmartWay to meet the five percent fuel savings criteria. Refrigerated-van trailers would be required to be retrofitted with low-rolling resistance tires and either (1) any combination of aerodynamic equipment that collectively meets or exceeds 4 percent fuel savings in accordance with test requirements defined by the SmartWay program, or (2) side skirts that are SmartWay approved. The lower percent fuel savings criteria for refrigerated-van trailers reflects the lack of a requirement for a front or rear fairing on these types of trailers. A front trailer fairing is not feasible on a refrigerated-van trailer because the transport refrigeration unit (TRU) is typically installed where the front trailer fairing would be mounted. Requiring a rear-fairing on all refrigerated-van trailers is too restrictive, since current SmartWay approved rear fairing technologies are not compatible with roll-up door trailers.

Table VIII-2: Proposed 2011 and Later Model Year Trailer Compliance Options, Beginning January 1, 2010

Trailer Type	Option 1: Purchase Certified SmartWay Trailer	Option 2: Retrofit Existing Trailer	
		Retrofitted with SmartWay approved low rolling resistance tires and SmartWay approved aerodynamic devices	Retrofitted with SmartWay approved low rolling resistance tires and aerodynamic devices demonstrated to meet min. fuel savings per SmartWay Program
Dry-Van	Available	Aero=side skirts + rear or front fairing	Aero must meet 5% fuel savings
Refrigerated-Van	Not Available*	Aero= side skirts	Aero must meet 4% fuel savings

* At time of publishing, U.S. EPA had not yet established SmartWay certification specifications for refrigerated-van trailers

b) Requirements for 2010 and Earlier Model Year Trailers

The 2010 and earlier model year 53-foot or longer box-type trailers that are pulled by tractors on California highways would be required to be retrofitted with SmartWay approved technologies by January 1, 2013. The retrofit requirements would be identical to the second option for 2011 and subsequent model year trailers described above. In lieu of meeting the January 1, 2013, compliance date, the trailer owner could choose to comply with an optional trailer fleet compliance schedule.

There are two proposed optional trailer fleet compliance schedules that would be based on trailer fleet size: the large fleet compliance schedule and the small fleet compliance schedule. A large fleet is defined as a fleet of 21 or more trailers. A small fleet is defined as a fleet of 20 or less trailers. In order to participate, a trailer owner that owns the requisite number of trailers would be required to meet the following criteria: (1) submit a compliance plan by July 1, 2010 for the large fleet optional compliance schedule or by July 1, 2012 for the small fleet compliance schedule, (2) meet the annual commitments for retrofitting trailers, and (3) allow ARB to audit records periodically. The compliance plan would include a statement of intent, information on each trailer, and details as to which affected trailers would be retrofitted to comply with each year of the optional phase-in schedule requirements. If the owner fails to comply with any of the three conditions for optional compliance participation, it may result in termination of the optional compliance schedule(s). If the fleet's participation in the optional compliance schedule is terminated, all trailers in the fleet have to be in compliance within 90 days or by December 31, 2012, whichever is later.

The large fleet compliance schedule is shown in Table VIII-3. A six year phase-in is proposed for large fleets beginning in 2010 and ending in 2015. For added flexibility, a

trailer owner could participate in an early compliance option. For every 2010 and earlier model year box-type trailer that is compliant with the proposed regulation by December 31, 2009, the owner could delay the retrofit of 1.5 noncompliant trailers until 2016. If a trailer owner participates in the early compliance option, the submitted compliance plan would need to contain information on the list of trailers that are brought into compliance by December 31, 2009, and the list of trailers that are delayed for compliance until 2016. The early compliance option is discussed in more detail in Appendix F, Optional Trailer Fleet Compliance Schedules.

Table VIII-3: Proposed Optional Large Fleet (21+) Compliance Schedule for 2010 and Earlier Model Year 53-foot or Longer Box-Type Trailers, Except Refrigerated-Van Trailers with Transport Refrigeration Units using 2003 to 2009 Model Year Engines.

	12/31/10	12/31/11	12/31/12	12/31/13	12/31/14	12/31/15
Required Percent Compliance	5%	15%	30%	50%	75%	100%

The small fleet compliance schedule is shown in Table VIII-4. The phase-in for small fleets begins in 2013 and ends in 2016.

Table VIII-4: Proposed Optional Compliance Schedule for Small Trailer Fleets of 2010 and Earlier Model Year 53-foot or Longer Box-Type Trailers

	12/31/13	12/31/14	12/31/15	12/31/16
Required Percent Compliance	25%	50%	75%	100%

3. Refrigerated Fleet Compliance Provision

Since refrigerated trailers would be concurrently impacted by the proposed regulation and the previously adopted Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate (TRU Rule), staff developed a special provision that would allow the delay of retrofits and retirements of certain in-use refrigerated trailers. Specifically, the refrigerated fleet compliance provision would apply to 2003 through 2008 model year refrigerated-van trailers equipped with 2003 and subsequent model year TRUs.

Because allowing the delay of all refrigerated trailers would significantly reduce the cumulative GHG benefits expected from the proposed regulation, the refrigerated fleet compliance provision would not apply to the following trailers:

- 2009 and 2010 model year trailers: The greatest GHG and fuel economy benefits would likely be achieved by bringing these trailers into compliance first. This is

because these trailers would be newer, so they would see more road miles and have more time to realize returns on investment.

- 2002 and previous model year trailers: These trailers would likely reach the natural end of their long-haul service before the phase-in of the refrigerated fleet compliance provision would begin.

In addition, because the provision would only apply to in-use trailers, 2011 and subsequent model year trailers would not be eligible.

A trailer owner participating under this provision would be required to bring trailers of the model years listed in Table VIII-5 into compliance by December 31 of the applicable year.

Table VIII-5: Refrigerated Fleet Compliance Deadlines

Year	2017	2018	2019
Trailer Model Year	2003-2004	2005-2006	2007-2008

4. Requirements for the Owner, Driver, Motor Carrier, Broker and Shipper

As mentioned previously, the responsibility for compliance rests primarily with the owner of the tractor and trailer, but the driver, motor carrier, California-based broker, and California-based shipper also share responsibilities. Noncompliance with the proposed tractor or trailer requirements may result in a notice of violation to each aforementioned party. The responsibility of the owner would be to ensure the applicable tractors and trailers comply with the proposed requirements within the proposed compliance schedule. The owner of affected trailers would also be required to report information to ARB on its trailers and its compliance plan, if applicable.

The driver would be responsible to ensure that the tractor-trailer to be driven is in compliance with this proposed regulation, Le., SmartWay certified, and meets the good operating condition criteria. If the tractor-trailer is not in compliance, the driver should refuse to operate the tractor-trailer. Failure to do so may result in a notice of violation. The driver should also ensure that the following information is available to be presented to authorized enforcement personnel: driver's license, tractor registration, origin of freight being transported, destination of freight being transported, and motor carrier information, if applicable.

Motor carriers would be responsible to ensure that a tractor-trailer they dispatch to pick up and deliver freight complies with the proposed regulatory requirements. To facilitate compliance, motor carriers would be required to provide the following information to the dispatched driver: the motor carrier business name, street address, contact person, and contact person's business phone number.

The requirements for California-based brokers are similar to those discussed in the previous paragraph for motor carriers. In addition, ARB would also have the authority to

restrict California-based brokers from using the services and vehicles of particular motor carriers, tractor owners and trailer owners that have failed to settle a previously issued notice of violation. This approach to enforcement is discussed in detail in Appendix G, Implementation and Enforcement.

The California-based shipper would be responsible to ensure that the tractors' and box-type trailers used to transport freight from its facility are in compliance with the proposed regulation. ARB would have the authority to restrict California-based shippers from using the services and equipment of particular motor carriers, California-based brokers, tractor owners and trailer owners that have failed to settle a previously issued notice of violation. This approach to enforcement is discussed in detail in Appendix G, Implementation and Enforcement.

Motor carriers, California-based brokers, and California-based shippers may choose to discharge the obligation to pay fines through contractual language. For example, once a fine has been assessed to a shipper, the shipper could have a contract with the noncomplying motor carrier that requires the motor carrier to pay all fines associated with the use of noncompliant tractor-trailers. Similarly, a motor carrier could also have a contract with a tractor or trailer owner requiring the tractor or trailer owner to pay all fines associated with the use of a noncompliant tractor or trailer, respectively.

F. Maintenance Requirements

Owners and drivers of the applicable tractors and trailers would be responsible to ensure that the applicable tractor and trailer are equipped with appropriate equipment and that the equipment is in good operating condition. The aerodynamic technology would need to be installed according to manufacturer's specifications, be securely fastened to the tractor or trailer, not bemissing any panels or sections, and not be damaged to the extent that its aerodynamic effectiveness is compromised. In addition, a rear trailer fairing must be designed such that, when not in-use, it can be folded back against the trailer or otherwise be readily compacted to allow normal functioning of the doors.

G. Exemptions

The proposed regulation would exempt certain types of tractors and trailers, as discussed previously in Section C of this chapter. For a short-haul tractor exemption, the trailer would need to be registered with ARB and approved as short-haul, requiring annual renewal. A short-haul trailer is defined as only operating within a 100 mile radius from the registered location where the trailer is garaged and maintained. A drayage truck would also be exempted from the proposed requirements. A drayage truck is defined as a truck that only operates within 100 miles of a port or intermodal rail yard property of origin or destination.

H. Reporting Requirements

For tractors, reporting would not be required for the owner of Class 7 or Class 8 tractors used exclusively for long-haul purposes. In order for a tractor or trailer to be classified as short-haul, and thus exempted from the proposed regulation, it would need to be registered with ARB. The owner would need to submit an application with specific information on the vehicle, vehicle owner, and vehicle's local haul base. For tractors, the owner would designate, in the application, whether the exemption will be based on a limit of 50,000 miles annually or a limit of operation within a 100-mile radius from its local base. Once approved, the tractor or trailer would be considered short-haul and not subjected to the **requirements** of the proposed regulation. The short-haul exemption would be effective for one year and would require renewal on an annual basis.

A trailer owner who does not choose to participate in any of the optional compliance schedules would not be required to provide reporting of trailers. However, if the owner chooses to participate in the optional compliance schedules, a compliance plan would be required to be submitted by July 1, 2010. The compliance plan would include a statement of intent, information on each affected trailer, and details as to which affected trailers would be retrofitted to comply with each year of the optional phase-in schedule requirements.

There are no recordkeeping requirements for shippers specified in the proposed regulation. However, ARB staff reserves the right to audit existing shipping records, if the shipper or broker continues to use noncompliant tractor-trailer owners and motor carriers after being notified of their noncompliance.

I. Enforcement and Fines

Enforcement of the proposed requirements may be carried out by authorized representatives of ARB, peace officers, and authorized representatives of an air pollution control district. A violation of the proposed requirements may result in civil or criminal penalties. A violation may be issued for failure to comply with the proposed tractor and or trailer requirements, failure to submit the appropriate information, or providing false information. The extent of the penalty would depend on the willfulness of the violation, the length of time of the noncompliance, the magnitude of the noncompliance, and other pertinent factors. Authorized enforcement personnel may stop trucks on the highway or at alternative locations, such as on the roadside, at weigh stations, or at loading docks, to ensure that the appropriate aerodynamic equipment and low-rolling resistance tires are properly installed and in good operating condition.

If the tractor or trailer does not have the appropriate aerodynamic equipment or low-rolling resistance tires, or if such equipment is damaged or not properly functioning, the enforcement personnel would write a notice of violation to the parties involved in the movement of freight in the noncompliant vehicle. These may include the owner, driver, motor carrier, California-based broker, and California-based shipper of the transported freight. While the owner of the tractor and trailer is solely responsible for purchasing SmartWay certified tractors and trailers, or retrofitting **tractors** and trailers with approved SmartWay devices, it would also be the responsibility of brokers and California-based

shippers to ensure that only compliant tractors and trailers are used to transport freight on California highways.

If the tractor and/or trailer has been approved for short-haul exemption, the enforcement personnel would crosscheck its exemption status with the ARB database and confirm that the short-haul tractor and/or trailer is operating within the 100 mile radius from its local base or is within its annual miles limit, whichever is applicable. Similarly, an enforcement officer may check a drayage truck to ensure that it is operating within 100 miles of the port or intermodal rail yard property. See Appendix F for a further discussion of implementation and enforcement issues.

IX. TECHNOLOGICAL FEASIBILITY OF CONTROL MEASURE

The proposed regulation would require heavy-duty tractors and box-type trailers to be SmartWay certified or use SmartWay approved equipment and tires. The vehicles and equipment necessary to comply with the proposed regulation are already commercially available and in use today. In addition, new technologies continue to emerge. Therefore, staff firmly believes that the technological feasibility of the proposed regulation is sound.

The following sections describe the availability of SmartWay certified tractors, SmartWay certified trailers, retrofit equipment for in-use trailers, and low-rolling resistance tires. In addition, because there have been concerns expressed about the reliability and safety of trailer side skirts, fleet experience with these technologies is discussed.

A. SmartWay Certified Tractors

The proposed regulation would require all 2011 and subsequent model year long-haul tractors that pull 53-foot or longer box-type trailers to be SmartWay certified. Most major truck manufacturers currently offer SmartWay tractors and have indicated that they are in a position to manufacture more if demand increases.

Since tractor models are designed as a single unit, retrofitting a tractor with SmartWay aerodynamic equipment after its initial build would not be practical. Therefore, for in-use tractors, the proposed regulation would only require the use of low-rolling resistance tires, and not aerodynamic technologies.

1. *Base Tractor*

For every SmartWay tractor, a manufacturer must first identify a "base tractor," upon which SmartWay features can be incorporated. To qualify as a base tractor, a tractor must have an overall aerodynamic profile and a high roof sleeper cab.⁷ Most major tractor manufacturers offer at least one base tractor that is eligible for the SmartWay program. Some examples are:

⁷ As defined by SmartWay Logo Use Guidelines - Language - Tractor Requirements
27Mar07.doc

- Freightliner Columbia, Century Class *SfT*, and Cascadia
- International Prostar and Lonestar
- Mack Pinnacle
- Kenworth T2000 and T660
- Peterbilt 387 and 386
- Volvo VN Series

Examples of SmartWay tractors are shown in Figure IX-1 ..

2. Aerodynamic Features

A base tractor must be equipped with all of the following aerodynamic features to be considered for SmartWay certification.⁸ These features have been defined for the purposes of this regulation as follows:

- Integrated sleeper cab roof fairing - a fairing located on the roof of a sleeper-cab-equipped tractor that extends from the front windshield of the tractor cab to the rear edge of the sleeper cab, with enclosed sides that line up with the sides of the sleeper cab.
- Aerodynamic mirrors - side mirrors designed to minimize air resistance
- Aerodynamic bumper - a front bumper designed to minimize air resistance
- Cab side extenders - vertical additions to the rear side of the tractor that fan out slightly and reduce the space between the tractor and trailer.
- Fuel tank fairings or chassis skirt - the fairing located at the base of the cab between the front wheel of the tractor and the forward-most rear wheel, covering the open space and streamlining the fuel tank.

⁸ As defined in SmartWay Logo Use Guidelines - Language - Tractor Requirements-27Mar07.doc

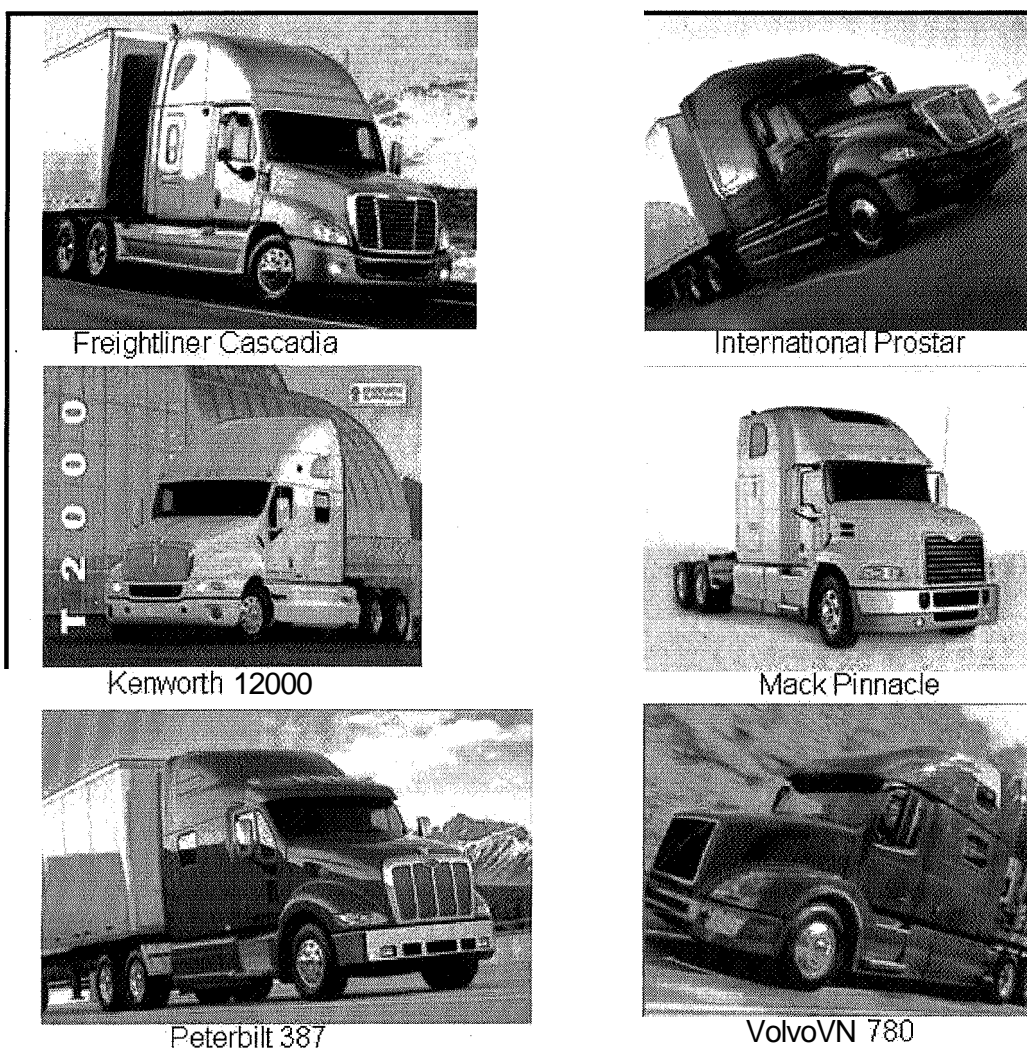


Figure IX-1: SmartWay Tractors

3. Experience with SmartWay Certified Tractors

Based on meetings with various fleets, experiences with SmartWay tractors have been favorable. The only concerns raised, that fuel tank fairings can get easily damaged, appear to be highly driver-specific. Therefore, staff anticipates that the damage can be minimized by providing additional guidance to drivers on how to prevent or minimize damage to the fairings.

4. Incremental Cost of SmartWay Certified Tractors

The aerodynamic tractor package cost, which includes low-rolling resistance tires, was determined from current available retail prices, fleet price quotes, and manufacturer price estimates for new SmartWay approved tractors. The average incremental cost of the equipment is about \$2,100, based on the purchase price of tractors equipped with the aerodynamic package. Specifically, this incremental cost assumes that the tractor is

equipped with an aerodynamic equipment package featuring fuel tank fairings or chassis skirts, cab side extenders, an integrated sleeper cab roof fairing, aerodynamic bumpers and mirrors, and low-rolling resistance tires.

5. Lifetime Costs of SmartWay Certified Tractors to Owners

The measure is expected to provide cost savings to tractor owners over the useful life of the tractor by reducing operational costs (Le., fuel consumption). A SmartWay certified tractor is expected to reduce fuel consumption by about 3.5 percent compared to a regular tractor, resulting in an annual fuel savings of approximately \$1,800. Looking at the equipment operating costs only, about \$22,000 savings is expected over a typical equipment life of 11 years. Equipment life was estimated from discussions with fleets which stated that a tractor will be typically used in the long-haul application for about 11 years. Accounting for capital cost, maintenance cost, and fuel savings to the tractor owner, the proposed requirement is expected to have a net cost savings of about \$6,000 (in 2008 dollars). Staff believes this is a conservative estimate of the savings since current California retail prices for diesel fuel are higher than the projected fuel cost used in this analysis. The cost of the SmartWay package for a tractor can, therefore, be recovered from fuel savings in 1 to 1.5 years. For further details on staff's cost analysis, see Chapter XII.

6. Production Availability

The proposed regulation would require that, beginning January 1, 2010, all applicable tractors be SmartWay certified. This section discusses two important issues associated with this requirement: 1) the anticipated demand for these types of tractors; and 2) the procedure that a tractor manufacturer would need to undergo to certify a SmartWay tractor model.

For model years 2011, 2015, and 2020, ARB staff estimates that 107,000, 129,000, and 143,000 new Class 8 SmartWay tractors, respectively, will be sold to comply with the proposed rule. These numbers represent about 70 percent of the total number of new Class 8 tractors sold nationwide in each of those years that will, at some point in their useful life, travel in California. Staff believes that tractor manufacturers will be able to meet the increased demand for SmartWay tractors resulting from this proposal.

Currently, there are six tractor manufacturers that sell a SmartWay base model tractor. Table IX-1 lists the manufacturers and the base tractor models that, when properly outfitted with aerodynamic equipment and low-rolling resistance tires, currently meet the SmartWay specifications. The decision-making process to develop a SmartWay tractor is normally preceded by a series of discussions between the U.S. EPA and the manufacturer to ensure mutual understanding of the technical specifications and requirements of the SmartWay program. Each manufacturer that is approved by the U.S. EPA to sell a SmartWay tractor must abide by a licensing agreement, included in Appendix D.

Table IX-1: U.S. EPA Certified SmartWay Tractors

Manufacturer	Base Tractor Model
Navistar International	Prostar 9200i*
Mack	Pinnacle Cascadia
Daimler (Freightliner)	Century Class Columbia
Kenworth	T660 T2000
Volvo	VN780 VN 730
Peterbilt	387 386

* will be replaced with the LoneStar model

B. Trailer Aerodynamic Technologies

1. Aerodynamic Technologies.

Aerodynamic technologies are defined in the regulation as components that are designed to reduce wind resistance on the tractor or trailer, resulting in improved overall tractor fuel economy and reduced carbon dioxide emissions. These technologies are currently available commercially through several U.S. and Canadian companies; additional companies are in the process of developing new or improved aerodynamic products. The types of equipment they currently offer include: trailer side skirts (sometimes called belly fairings), front fairings, rear fairings, strakes, traps, and others. These aerodynamic products and the companies that manufacture them are briefly described below. Some of the identified technologies are SmartWay approved at the present time, while others are not. It should be noted that this summary does not imply an endorsement of any of the companies or products identified below, nor does it claim to reflect a comprehensive list of all aerodynamic technologies currently available or under development for box-type trailers.

a) Trailer Side Skirts

Trailer side skirts are fairings that extend down from the bottom of the trailer to cover part of the open space between the tractor and the rear trailer wheels. They can be used on dry-vans as well as on refrigerated-vans. The range of fuel savings demonstrated by side skirt manufacturers is between 4 percent and 7 percent. Currently available side skirts are made of aluminum, thermoplastics, or composite materials. Some are constructed of individual panels that can be replaced separately in the event they are damaged, while others are constructed as a single unit extending the length of the skirt. One design consists of dual, parallel side panels. A set of side skirts, on average, may weigh between 150 and 350 pounds, depending on the material, length, and configuration of the skirt. The amount of ground clearance

provided by the various side skirts varies somewhat across the different models; generally they average between 10 and 20 inches from the ground in order to strike a balance between maximizing fuel savings and avoiding potential damage due to road hazards or steeply sloping ramps. According to the manufacturers, installation times per trailer range between three and six hours, although some anticipate shorter times when installed by fully trained installers.

The retail costs to purchase a single set of trailer side skirts range between \$1000 and \$2600, excluding installation. Fleet volume pricing would be lower. It is anticipated that as demand for these technologies increases, costs will likely drop. The cost to replace a panel varies considerably depending on the design of the skirts, from \$80 to \$500.

Five different companies manufacture trailer side skirts; four of them offer skirts that are commercially available at the time of this writing, while the fifth company is still in the prototype phase.

Currently Available Trailer Side Skirts:

Figure IX-2 contains photographs of side skirts offered by the four companies discussed below.

- Freight Wing Incorporated offers a selection of side skirts, which they market as Belly Fairings, adapted for different types of trailers. Three of these configurations are currently SmartWay approved, including the Standard Belly Fairing shown in Figure IX-2. Earlier models of the Belly Fairings were constructed of aluminum, while their newest version is made from high density polyethylene.
- Laydon Composites Ltd. offers the TrailerSkirt, a full-length injection molded side skirt. It is made of ABS plastic with a rubber strip along the bottom. This product is constructed of separate panels; the number of panels used will depend upon the length of the trailer (typically between 6 and 8 per side). The Laydon TrailerSkirt is SmartWay approved.
- Silver Eagle Manufacturing offers Mini-Skirts (see two photographs in Figure IX-2). The Mini-Skirts are made of aluminum and designed with dual parallel side panels that are constructed in four-foot modules. As of this writing they are not yet SmartWay approved.
- Transtex Composite manufactures the MFS Skirt out of a fiberglass/thermoplastic composite material. It is constructed of a single panel on each side. The MFS Skirt is SmartWay approved.

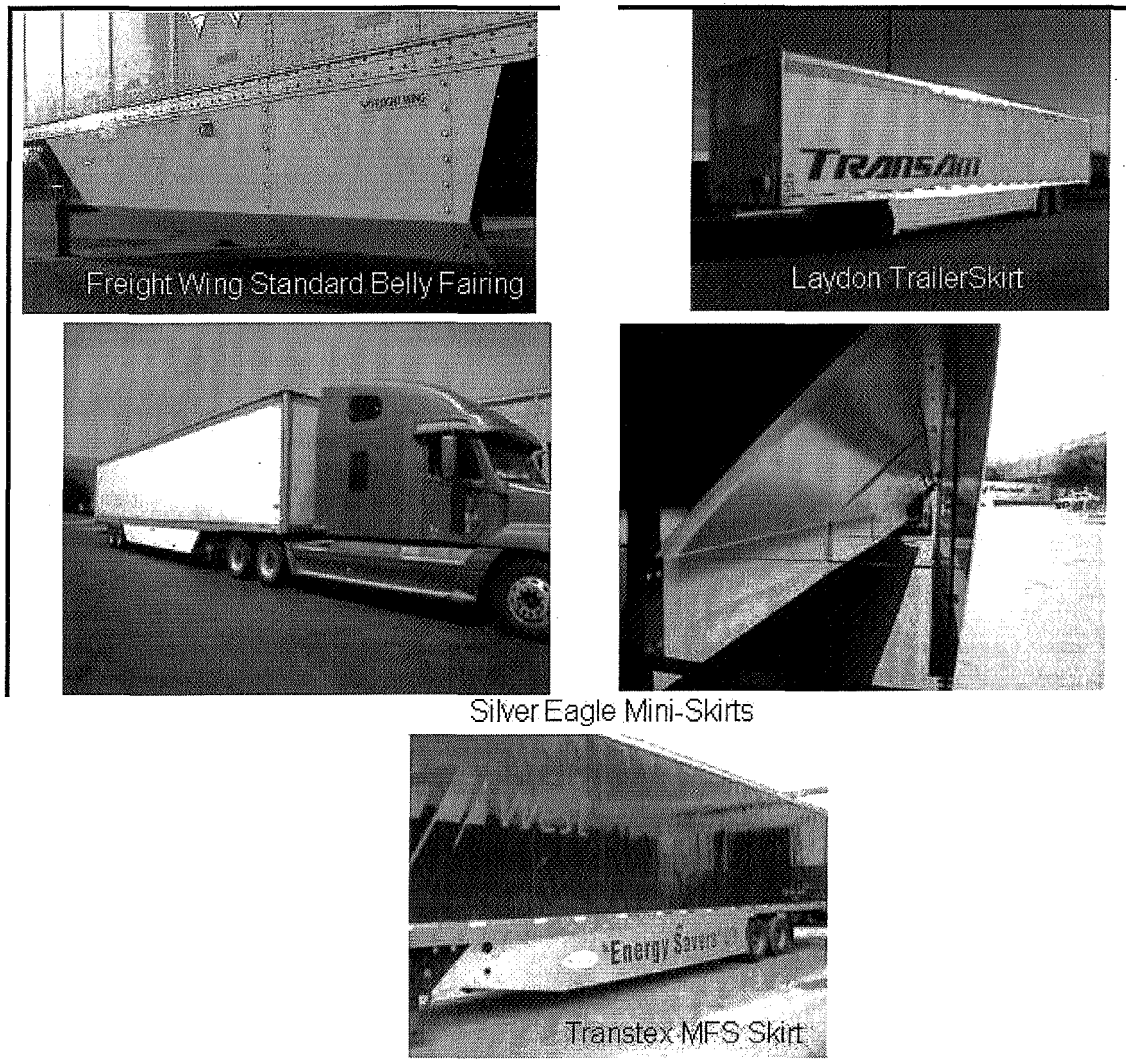


Figure IX-2: Trailer Side Skirts

Still In Development:

- Adamworks has developed the AeroMax Retractable Fairing System, which is currently in the prototype phase. It is designed to be pneumatically controlled and speed sensitive; it deploys at 35 miles per hour (and retracts when speeds fall below 35 miles per hour). When deployed, it reaches within a few inches of the ground, and when retracted, it stays at about 20 inches above ground (see Figure IX-3). The potential advantages of this type of design are that it reduces the chance of damage at low speeds or at loading docks (when retracted), and yet offers potential additional efficiency improvements when deployed closer to the ground, thereby reducing air flow under the trailer. As of this writing, this device is not yet SmartWay approved.



Figure IX-3: Adamworks Aeromax Retractable Fairing

b) Front Trailer Fairings

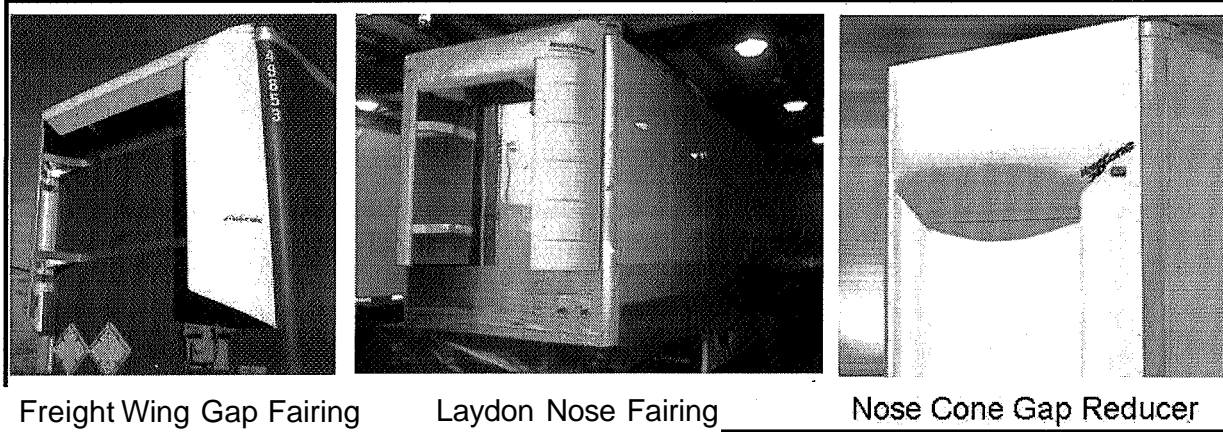
Front trailer fairings are defined in the regulation as curved structures that attach to the front facing surface of a trailer that covers all or part of the trailer's front facing surface. These devices serve to reduce the wind resistance caused by the gap between the tractor and the trailer and allow for smooth, 'uninterrupted air flow, regardless of the angle of approaching wind. They are most effective when installed on tractor-trailers with a gap greater than 36 inches. They are designed to be used on dry-vans and not on refrigerated-vans. The average fuel savings associated with front trailer fairings is between 1 percent and 2 percent. Currently available front trailer fairings are constructed of aluminum; fiberglass or plastic. They typically weigh between 75 and 140 pounds.

The approximate retail costs for current front trailer fairings range between \$800 and \$1000.

The following three companies manufacture some type of front trailer fairing, as shown in Figure IX-4:

- Freight Wing Incorporated produces a few different front trailer fairings. One model, the Gap Fairing, is SmartWay approved. It consists of three curved aluminum panels that extend forward and inward from the top and sides of the trailer front.
- Laydon Composites Ltd. produces the Nose Fairing, which is currently made of fiberglass. It is SmartWay approved. It consists of three elongated hemispheric structures that extend along the top and sides of the trailer front.

- Nose Cone manufactures the Nose Cone/Gap Reducer. It is a rounded air deflector that is installed on the upper front portion of a trailer. The Nose Cone is most effective on trailers pulled by tractors that do not have the extended roof fairings. Previously constructed of aluminum, a newer, plastic version of the Nose Cone has received SmartWay approval, and will soon be commercially available.



Freight Wing Gap Fairing

Laydon Nose Fairing

Nose Cone Gap Reducer

Figure IX-4: Front Trailer Gap Fairings

c) *Rear Trailer Fairings*

Rear trailer fairings are structures that attach to the outer edges of the trailer's rear-facing surface to provide a continuous surface for the air passing over the side and top surfaces of the trailer. Some models also have a base plate on the lower surface. These fairings reduce turbulence and resistance by reducing "suction" on the rear of the trailer. They can be used on both dry-vans and refrigerated-vans. The fuel savings associated with rear trailer fairings ranges between 1 percent and 5.1 percent.

The following three manufacturers offer some type of rear trailer fairing, as shown in Figure IX-5.

- Advanced Transit Dynamics (ATDynamics) manufactures a rear trailer fairing called the TrailerTail. The TrailerTail is a rigid structure that extends four feet out from the perimeter of the rear of the trailer when deployed. It collapses when the rear doors of the trailer are opened, and it expands into its aerodynamic configuration when the doors are closed. This device is SmartWay approved.
- Nose Cone manufactures the Tail Cone. This device is installed on trailers that do not open at the rear. As of this writing, this device is not SmartWay approved.
- Transtex Composite manufactures the BoatTail rear air deflector. It automatically folds away when the rear doors are opened, and folds flat against the sides of the trailer so as not to interfere with loading or unloading. As of this writing, this device is not SmartWay approved.

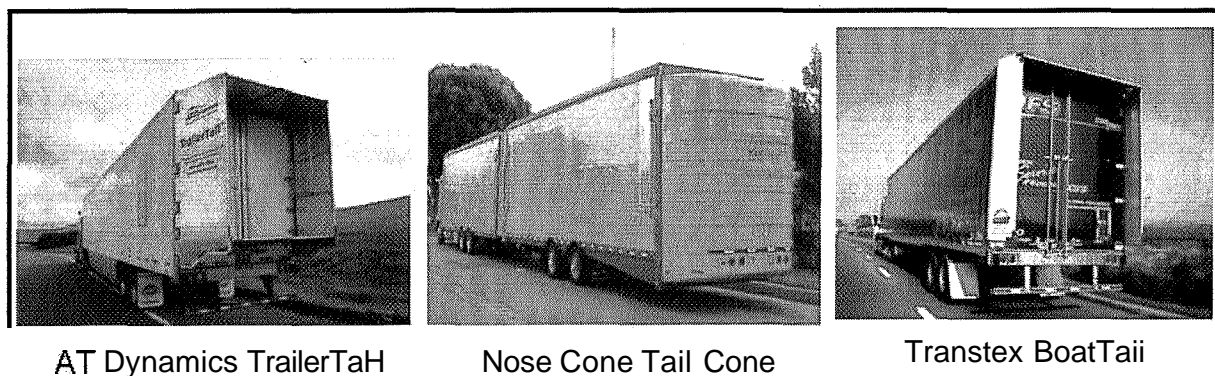


Figure IX-5: Rear Trailer Fairings

The ranges of fuel savings offered by each of the three types of aerodynamic devices discussed previously are shown in Table IX-2 below. In general, staff expects the benefits of using more than one type of device to be additive, although there may be synergistic effects or interactions that may limit those additive benefits.

Table IX-2: Fuel Savings Ranges for Trailer Aerodynamic Devices (Freight Wing, 2007; Laydon, 2007; Surcel, 2007a; Surcel, 2007b)

Trailer Aerodynamic Devices	Fuel Savings Range
Side skirts	4%-7%
Front gap fairings	1%-2%
Rear fairings	1% -5.1%

d) Other Technologies

Several manufacturers have developed additional technologies to improve trailer aerodynamics, including other types of fairings and a variety of flow control devices (vortex strakes, vortex traps, air talons). As of this writing, these devices are not SmartWay approved but, if approved, may potentially play a role in meeting California's proposed requirements.

2. Experience with Aerodynamic Technologies

ARB staff spoke with representatives of several fleets that have been using some of the aerodynamic technologies identified above in order to ascertain what their "real world" experiences have been with the technologies. Details of these discussions can be found in Appendix E: Fleet Summaries. For the most part, as described below, these companies have used some type of trailer side skirt and, in a few cases, some other type of technology. It should be noted that the majority of fleets with whom staff spoke

were customers of the manufacturers identified in the previous section of this report. Staff also spoke with representatives of two large nationwide fleets that do not currently use trailer aerodynamic technologies; these fleets had some previous negative experiences with them. Their comments, one of which is detailed in Appendix E (the other fleet refused to allow its inclusion in this report), are also summarized below in the Previous Users of Aerodynamic Technologies section.

a) *Current Users of Aerodynamic Technologies*

Fleet Descriptions

The companies with whom staff spoke are located in different parts of the United States, including the East, Midwest, South, and West, as well as eastern Canada. Fleet sizes ranged from fewer than 50 trailers to over 20,000 trailers. Some operated dry-vans exclusively or refrigerated-vans exclusively, while others operated a variety of different types of trailers. The majority operated mostly 53-foot trailers, although one used smaller trailers (48-foot) exclusively.

Types of Aerodynamic Technologies

All of the fleets indicated that they have been using at least one type of side skirt over a period of between nine months and more than two years. The numbers of skirts they currently use vary considerably, from 2 to 200 skirts, depending primarily on the size of their fleet. Some fleets reported that they are planning to install skirts on all of their trailers, while others have not yet decided or do not have the capital to invest in them at the present time. The majority have continued using the same brand of device; only a minority reported trying more than one brand. Also, only a minority have tried devices other than side skirts. Of those fleets, a few have tried some type of gap reducing fairing, and fewer have tried a rear trailer fairing.

Fuel Economy and Other Benefits

In the real world it is difficult to isolate the benefits achieved using one particular aerodynamic technology from all other fuel-saving strategies and technologies that may be used. Many of the fleets reported that besides side skirts, they also employ the following fuel-conserving practices or technologies: speed governing, extensive driver education and incentives, low-rolling resistance tires, more fuel efficient (SmartWay) tractors, auxiliary power units, etc. For that reason, several fleets were not able to isolate the fuel savings achieved from individual components. For those fleets that could isolate the benefits, they attributed an estimated three to six percent improvement in fuel economy with the skirts - a significant improvement according to these fleet representatives.

In addition to fuel economy, the fleets reported additional benefits when using trailer side skirts, including a smoother and more stable ride, particularly in a crosswind; less side spray in the rain; and an overall improvement in the ability of the trailer to follow straighter. Most fleets were convinced that trailer skirting improves overall safety.

Damage and Repair Issues

The vast majority of the fleets reported having very few incidents of damage to the side skirts. Of those who reported any damage, all were minor. Many were caused by driver error, while some were caused by unavoidable accidents. In all cases, none resulted in any serious damage to their equipment or anyone else's property. None reported any pieces of the skirts becoming disconnected and flying off the trailers. A few reported that when damage did occur, the driver was able to take action to secure the situation before driving on the road.

When damage occurred to aluminum skirts, fleets reported they were often able to repair minor damage themselves, by hammering the skirt back into shape. When that was not possible, fleets reported that either they had extra replacement panels (where applicable) or that the manufacturers quickly sent them replacement panels so that repairs were made within a few days.

Based on anecdotal information, staff became aware that side skirts might accumulate excessive amounts of snow and ice in colder climates. However, several fleets specifically indicated that they do operate in colder climates and severe weather, and have not experienced any problems with snow or ice build-up. Nevertheless, the skirt manufacturers have become aware of these potential concerns and are taking steps to avoid any future problems.

Although the majority of fleets have not used rear fairings, a few expressed skepticism about the safety and ease of using them. They reported concerns that drivers or individuals who load or unload the trailers but are unfamiliar with the equipment could easily damage the rear fairings. Staff anticipates that as drivers and warehouse personnel become more familiar with the technologies, these concerns will disappear. In addition, aerodynamic equipment manufacturers are taking steps to further develop and improve their products to eliminate these potential problems.

Costs and Return on Investment

The majority of fleets reported paying between \$1000 and \$2600 for their skirts. Several of those who purchased their skirts about two years ago were able to take advantage of a grant that paid for one-half of the cost, up to a certain number of skirts. The return on investment achieved by some of the fleets (excluding those who received grant funding), averaged about 18 months, and ranged from a few months to 3 years (most of the fleets reported a trailer-to-tractor ratio of 2-to-1 or 2.5-to-1).

b) Previous Users of Aerodynamic Technologies

Staff spoke with representatives of two companies with large fleets who had used trailer side skirts in the past, but either stopped using them or were in the process of phasing out their use. The following paragraphs identify the main reasons why these companies are not current proponents of side skirt use, and discuss how these concerns are being addressed.

- Side skirts installed on trailers were damaged by scraping the ground when encountering elevated railroad track crossings and steep loading dock ramps. Side skirt manufacturers are well aware of this concern and have developed workable solutions that are incorporated in many of the side skirt models available today. These solutions include using more pliable and durable materials, adjusting the height of the skirts to provide more clearance where necessary to prevent damage, and designing the skirt to retract when traveling at slow speeds.
- Side skirts were damaged when encountering objects such as snow banks or fire hydrants. As noted in the previous section on Damage and Repair Issues, fleets that are currently using side skirts have not encountered significant damage to their side skirts. When damage did occur, it was usually minor and often caused by driver error.
- Side skirts were pulled away from their mounting brackets by the wind force encountered while traveling on the highway. Most fleets contacted did not experience this issue.
- Side skirts and their support structure collect snow and ice in inclement weather, adding weight to the trailer and posing a safety hazard as the ice breaks away when the trailer is traveling on the highway. As discussed previously, current side skirt users, including those who operate in extreme weather conditions, have not encountered these problems. Moreover, the manufacturers have indicated that the materials from which their skirts are constructed tend to repel snow and ice. Staff therefore anticipates that these issues will continue to be addressed by skirt manufacturers.
- Rain flowing off the side skirts caused a "blinding" spray on vehicles directly behind and near the trailer. Fleets that currently use side skirts did not raise this comment; in fact, some commented that the skirts provide enhanced visibility for the truck driver.
- Side skirts caused additional delays when crossing the U.S.-Mexico border. Staff anticipates that as border inspection personnel become more familiar with such aerodynamic devices as side skirts, they will become more efficient at inspecting trailers equipped with them, and will no longer delay those vehicles.
- High trailer-to-tractor ratio makes outfitting an entire large fleet with skirts cost-prohibitive. Staff recognizes that the return on investment for such fleets will be longer than for the average fleet, but anticipates that these fleets will eventually realize the cost savings during the trailer's life.

3. Incremental Cost of Aerodynamic Technologies

Staff estimated the cost of aerodynamic devices based on currently available retail prices, fleet price quotes, and equipment manufacturer prices for new SmartWay trailers. The amount of time to install the aerodynamic equipment varied, depending on the experience of the person(s) doing the installation. Staff used a typical or average time for installation of four hours and a labor rate of \$50 per hour. Thus, the average incremental cost of the aerodynamic equipment for the trailer (which would include side

skirts and front fairings) would be about \$2,900. For further details on staff's cost analysis, please see Chapter XII.

4. *Lifetime Costs of Aerodynamic Technologies to Owners*

The proposed requirements are expected to provide cost savings to owners of trucking businesses over the useful life of the trailer by reducing operational costs (i.e., fuel consumption). The cost of the add-on devices for a trailer can be recovered from fuel savings in 18 months. Looking at the equipment operating costs only, about \$35,000 savings is expected over a typical equipment life of 11 years. Staff used 11 years to be consistent with the equipment life of a long-haul trailer. However, it is recognized that a trailer may be used for many years in a long-haul application beyond the assumed equipment life of 11 years. Accounting for capital cost, maintenance cost, and fuel savings, the proposed requirements are expected to result in a net cost savings of about \$13,000 per trailer (in 2008 dollars). Staff expects that aerodynamic equipment prices may be lower for future purchases because of increased production and additional manufacturers of approved equipment entering into the market. Again, for further details on the staff's cost analysis, please see Chapter XII.

5. *Product Availability*

Although recent increases in the cost of fuel have made aerodynamic technologies for trailers more attractive, demand for them has been extremely limited up to this point. Some of the manufacturers identified earlier in this chapter have been producing aerodynamic technologies for only a few years. Nevertheless, some of them have indicated that they will have the capability to meet upcoming demand for their devices in their existing facilities by increasing the number of shifts they operate or by purchasing additional equipment to increase the number of production lines. Others indicated that they have licensed their technology to other larger and more nationally distributed companies, or that they can subcontract production of their products to other manufacturers. It is anticipated that the phase-in period provided by this proposal will give manufacturers time to expand production volumes and help stabilize the cost of the technologies.

C. Tractor and Trailer Low-rolling Resistance Tires

1. *SmartWay Approved Low-rolling Resistance Tires*

Under the SmartWay program, the assumption is that for every 5 percent reduction in tire rolling resistance, a 1 percent reduction in fuel savings is attained (U.S. EPA, 2008). The goal of requiring low-rolling resistance tires is to achieve a fuel consumption savings of at least 3 percent. In order for tires to be SmartWay approved, U.S. EPA requires manufacturers to provide test data that demonstrate their tires meet the SmartWay performance requirements, using one of the following test methods:

- Using the SAE J1321 Type II fuel consumption test, demonstrate a 3 percent (or greater) fuel savings with low-rolling resistance tires. This test must be performed on a test track, rather than "in service", or

- Using the SAE J1269 tire rolling resistance test, demonstrate that the tire's rolling resistance coefficient complies with the SmartWay "target values." These values (see Table IX-3) are axle-specific.

Table IX-3: Comparison of Tire Rolling Resistance Coefficients

Tire Position	Standard Tire (kg/metric ton)	SmartWay Tire (kg/metric ton)
Steer Axle	6.8	5.8
Drive Axle	8.6	7.3
Trailer Axle	6.1	5.2

After analyzing tire rolling resistance data, U.S. EPA set the SmartWay target values at 15 percent below the midrange coefficient levels of the most commonly used long-haul tires. A 15 percent reduction in tire rolling resistance results in a 3 percent reduction in fuel consumption. The SmartWay target values for tire rolling resistance are expressed in kilograms (kg) per metric ton. This measurement takes the amount of resistance forces within a tire and divides it by the load mass supported by that tire. For example, a tire with a rolling resistance coefficient of "6" (when tested under SAE J1269) has 6 kilograms of resistive tire forces for each metric ton of downward force on that tire. Thus, about 60 newtons of constant force would be required to overcome the rolling resistance of such a tire.

2. Experience with Low-rolling Resistance Tires

As stated in SAE J1269, rolling resistance is defined as the scalar sum of all contact forces tangent to the test surface and parallel to the wheel plane of the tire. The rolling resistance coefficient is the ratio of the rolling resistance to the load on the tire (SAE J1269). Simply put, the more rolling resistance a tire has, the more energy is required to move a vehicle. The three main physical causes of rolling resistance are: hysteretic losses, aerodynamic drag, and friction losses (tire/ground and tire/rim).

Hysteresis is the phenomenon whereby the tire material's internal molecules slip against one another. The energy that should be converted to do the mechanical work of moving the vehicle forward ends up getting released in the form of heat. Hysteresis occurs as the tires go through their continuous deformation and recovery cycles (Bajer, 2008); *Le.*, *deforming* when in contact with the road (and bearing the weight) and *recovering* when not in contact with the road). By using more resilient rubber compounds in the manufacturing process, hysteretic losses can be reduced.

Aerodynamic drag stems from the wind drag caused by a tire's tread design. Although it can provide additional traction, an aggressive, zigzag tread pattern with deep lugs has significantly more wind drag (especially at high speeds) than does a rib tread design with straight grooves. By designing tread patterns that are more aerodynamic, wind drag is reduced; resulting in lower rolling resistance.

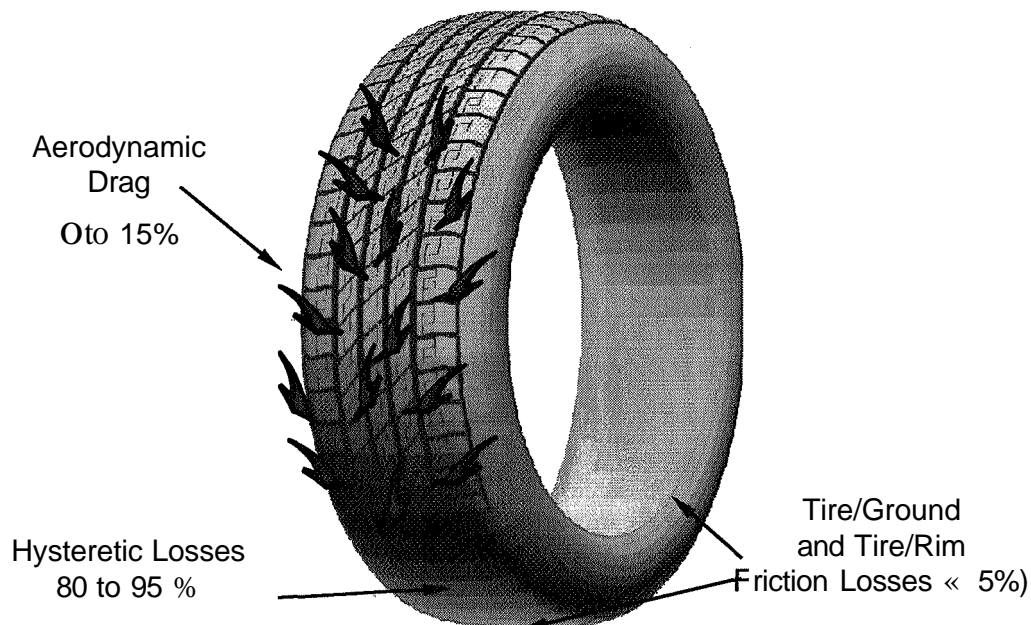


Figure IX-6: Contributors to Rolling Resistance (Michelin, 2002)

Friction losses between the tire and road and between the tire and rim are particularly prevalent when tires are new. Forces on drive tires due to acceleration, and upon all wheels due to turning and heavy loads, can cause flexing and scuffing to the tire tread and sidewalls that result in extra friction. Rough road surfaces further exacerbate this problem. The taller, deeper treads of a new tire are more susceptible to this condition (lack of lateral stiffness) because there is more tire material available to flex. As a tire wears down, lateral stiffness increases and rolling resistance decreases; resulting in fuel economy benefits that increase as the tires' tread depth decreases. Therefore, to provide lower rolling resistance, SmartWay tires are designed with tread depths that are slightly shallower than most standard long-haul tires. Improvements to the tire casings have also been made to reduce sidewall flexing and casing growth (Le., stretching out of shape), as well as strengthening of tire beads to better stabilize tire-to-rim contact.

The development of low-rolling resistance tires began largely in response to the 1975 Energy Policy Conservation Act, which established Corporate Average Fuel Economy standards for passenger cars and light trucks. Since 1980, the tire and rubber industry has responded by reducing the rolling resistance of tires by more than 50 percent. One of the greatest factors that reduced rolling resistance was the shift from bias-ply tires to radial tires. Although still manufactured (largely due to lower cost), bias-ply tires produce higher friction and heat than radials, which results in higher rolling resistance and fuel consumption.

There are several other factors that affect a tire's rolling resistance, including tire mass, rubber formulations, tread design, inflation pressure, speed, ambient/tire temperature, applied drive torque, surface roughness, and the vehicle's wheel alignment (front/steer tires). Improvements to the factors over which tire manufacturers have control (Le., tire

mass, rubber formulations, and tread design) are the focus of the SmartWay performance requirements.

3. Incremental Costs of Low-rolling Resistance Tires

According to a tire industry trade publication, in 2005 almost 70 percent of original equipment tires and over 60 percent of replacement tires sold for HDV use were radials (MTD, 2006). With the advent of the SmartWay program, combined with the recent increase in fuel costs, staff believes these percentages are considerably higher today. In the staff's analysis, the cost of SmartWay approved tires over standard HDV radial tires ranged from about \$0.00 to \$50.00 per tire, with an incremental cost of \$0.00 to \$900.00 to replace the tires on a tractor and trailer. The average incremental cost for those upgrading to SmartWay tires from bias-ply tires would be slightly higher, but their fuel economy benefit will be significantly greater than those who are already using radial tires. The estimated tire prices were determined from price quotes obtained from fleets, tire manufacturers, and tire retailers. For this analysis, staff assumed that the typical HDV has 18 tires: two steer tires, eight drive tires, and eight trailer tires. Although SmartWay approved tires typically have slightly shallower tread depths, improvements to both the tire casing and tread design have shown that some low-rolling resistance tires may last as long as their conventional counterparts. Moreover, many fleets are already equipping their tractors and trailers with SmartWay approved tires, so their capital expenses for tires have been made already.

4. Lifetime Costs of Low-rolling Resistance Tires

With respect to tires, there are notable differences between tractor-trailers and passenger cars. Most notably, when the tires wear out on passenger cars, they are discarded for new ones. However, when tractor-trailer tires wear out, the tire casings are usually retreaded and put back into service again. Therefore, it is not uncommon for a tire to start off "new" as a steer tire, get retreaded and used as a drive tire, and then retreaded once or twice more and used as a trailer tire before being discarded. Some fleets may retread the trailer tires even more often, if the casing remains serviceable. Taking this practice into account, staff estimates that tractor-trailers equipped with SmartWay approved tires will realize an annual fuel cost savings ranging from \$500 to \$1,000 (greater fuel savings for those replacing bias-ply tires with SmartWay tires).

Another benefit from the use of low-rolling resistance tires is that, because the tires run cooler, the tire casings are subject to less heat and fatigue, thereby, improving the likelihood that the casings of SmartWay tires will be candidates for multiple retreadings. Besides the cost savings associated with retreads (about one-half the cost of new tires), retreads result in a reduction in the demand for petroleum. Tires are petrochemical products. On average, it takes about 22 gallons of oil to produce a new tire. However, it only takes about 7 gallons to produce a retread (TRIB, 2008). Thus, retreading is not only a cost-effective alternative, but it also reduces the demand on petroleum resources.

5. Product Availability

In discussions with tire manufacturers, the added demand for SmartWay tires does not pose a product availability problem. In years past, tire longevity and traction were the important considerations when selecting tires. Now, following the recent increase in fuel costs, the demand for fuel-efficient tires has come to the fore. Manufacturers are already working towards making their tires more fuel efficient. Although staff anticipates that additional tire manufacturers will produce low-rolling resistance tires that meet the performance requirements of SmartWay, there are currently four manufacturers with SmartWay approved tires: Bridgestone, Continental, Goodyear, and Michelin. According to a recent trade publication (MTD, 2008), these four companies comprise over 79 percent of the truck tire market share. Moreover, each one of these manufacturers produces SmartWay approved tires (listed below) in both the 22.5-inch and 24.5-inch HDV rim sizes, and in tread designs optimized for the steer, drive, and trailer axle positions.

Bridgestone
Steer R287, R280
Drive M720, Greatec
Trailer R195, Greatec

Goodyear
Steer G395 LHS Fuel Max
Drive G305 LHD Fuel Max
Trailer G316 LHT Fuel Max

Continental
Steer HSL
Drive HDL Eco Plus
Trailer HTL

Michelin
Steer XZA3, XZA2
Drive XDA Energy, XDA3, X-One XDA
Trailer XTA Energy, XT1, X-One XTA

Another option for the drive and trailer axle positions is the use of SmartWay approved wide base tires, or "super singles." Unless originally equipped, this alternative requires replacing the dual-wheel configuration on the drive and/or trailer axles with a single, wide tire and rim. The super single tires provide excellent low-rolling resistance and fuel economy; and because they weigh less, they allow for greater carrying freight capacity.

X. ALTERNATIVES CONSIDERED

Staff developed the proposed regulation in an open public process, initially presenting draft regulatory concepts that evolved into the proposed regulation. During the regulatory development process, the scope, structure, and requirements of the regulation changed based on information staff gained through its own research and through information exchanged at public workshops and separate meetings with interested stakeholders. Ideas that were formulated during the development process and incorporated in the final proposed draft regulation included: adding California-based shippers to the list of regulated entities; removing receivers and non-California-based brokers from the list of regulated entities; exempting short-haul tractors and trailers,

defining an optional compliance schedule that extends over several years, exempting curtain-side trailers, and providing credit for early actions.

When determining whether a suggested change should be incorporated into the proposed regulation, staff considered the impact the proposed change would have on reaching the following goals:

- Achieve maximum reductions in GHG emissions as expeditiously as possible by improving the efficiency of long-haul tractors and trailers;
- Base the regulation's requirements on the U.S. EPA's SmartWay technology specifications and requirements for improved tractor and trailer aerodynamics and reduced rolling resistance;
- Delay the cost to fleet owners that are also retrofitting or replacing equipment to comply with title 13, California Code of Regulations, section 2477, Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate;
- Ensure that the regulation is enforceable on both California-based and out-of-state-based tractors and trailers;
- Achieve a positive cost-benefit ratio resulting from substantial fuel savings;
- Achieve cost-effective emission reductions on a dollar per ton basis; and
- Achieve these goals while keeping in mind the U.S. EPA SmartWay approved technologies available today and likely to become available over the next few years.

The alternative regulatory structures considered and reasons they were rejected in favor of the proposed regulation are summarized in Table X-1 below.

Table X-1: Alternative Regulatory Structures Considered

Approach	Why Rejected
No action - Tractor and trailer owners would install SmartWay technology on a voluntary basis in accordance with the U.S. EPA SmartWay program requirements.	SmartWay technologies have been available for several years and most truck and trailer owners have not installed them despite available fuel savings. Would prevent ARB from meeting GHG emission reduction goals required by AB 32.

Don't limit applicability of regulation to heavy-duty tractors pulling 53-foot or longer box-type trailers

- Expand applicability of aerodynamic technology requirements - Require aerodynamic technologies to be installed on box-type trailers of any length and on straight trucks
- Expand applicability of low-rolling resistance tire requirements - Require low-rolling resistance tires on all heavy-duty tractors, trailers, and heavy-duty straight trucks.
- Beyond scope of current U.S. EPA SmartWay Program
 - o No SmartWay approved aerodynamic technologies exist for straight trucks.
 - o SmartWay approved technologies only exist for 53-foot or longer box-type trailers
 - o SmartWay certified trailers are all 53-foot or longer.
- Extending regulation to straight trucks results in only modest increase in GHG reductions.
- Heavy-duty tractors pulling 53-foot or longer box-type trailers comprise the majority of long-range mileage from heavy-duty tractors. Those vehicles will see the greatest fuel economy benefits from the use of aerodynamic technologies and low-rolling resistance tires.
- Information to quantify the emission benefits of low-rolling resistance tires on other heavy-duty truck applications is lacking. Thus, it is difficult to assess at this time whether the benefits would outweigh the costs.

The sections below provide further quantification and detail on the two alternative regulatory structures identified in Table X-1.

A. No Action

During the course of the regulatory development process, tractor and trailer owners, as well as representatives of trucking industry associations, suggested that the best approach is to continue with the voluntary U.S. EPA SmartWay Program. They argued that at this time there are insufficient data available to demonstrate how the various aerodynamic technologies and low-rolling resistance tires perform in real world operations to support a regulation that mandates their use.

Staff agrees that the use of aerodynamic technologies and low-rolling resistance tires by current long-haul transport fleets is not widespread. However, staff believes that there are sufficient laboratory test data (generated by U.S. EPA's SmartWay program, Chapter VII) as well as real-world data (information gathered by staff, Chapter IX) to support requiring their use in accordance with the proposed regulation.

The reported negative experiences with aerodynamic devices include increased weight with little or no fuel efficiency gain, extent and frequency of fairing damage, and additional weight added due to snow and ice build-up. The negative experience with low-rolling resistance tires includes little or no fuel economy savings and loss of traction" in off-road applications. The negative concerns about adding weight without fuel efficiency gains is being addressed in the proposed regulation by limiting the requirement to add aerodynamic devices to only long-haul applications, where most vehicle miles traveled are done at highway speeds. Further, by limiting the low-rolling resistance tire requirement to tractor-trailer rigs comprised of tractors pulling 53-foot or longer box-type trailers on California highways, concerns about loss of traction are largely mitigated, since typical off-road applications (e.g., logging, construction equipment transport) are not impacted by the proposed regulation. Other negative experiences like fairing damage and snow/ice buildup have largely been addressed by aerodynamic device manufacturers. In summary, staff believes the negative experiences associated with aerodynamic and low-rolling resistance tire technologies required by the proposed regulation are being addressed by the manufacturers of those products and are further lessened by limiting the applicability of the proposed regulation to long-haul tractor-trailer rigs.

Although the SmartWay program has been in place since 2004, a relatively small number of tractors and trailers have been retrofitted with aerodynamic technologies in response to this program. This is especially true for trailers, where staff estimates that less than 0.3 percent of the total 53-foot or longer box-type trailer inventory incorporates aerodynamic technologies. Part of the reason for this lack of use of aerodynamic technologies is that SmartWay partners are choosing other options to reduce the GHG footprint of their businesses. Strategies chosen include reduction in idling time, increasing intermodal transport, reducing trailer weight, and using cleaner diesel engine technologies. But the question still remains, why don't they choose to retrofit trailers instead of some of these other options when meeting their SmartWay goals? Staff believes the decision not to retrofit is rooted in the conservative nature of the long-haul transport business and the magnitude of the up-front capital costs to retrofit an entire fleet of trailers.

Staff estimates that the average capital cost to comply with the proposed regulation is approximately \$5,000 per tractor and trailer affected. About \$2,900 is needed to retrofit a box-type trailer with aerodynamic technologies and low-rolling resistance tires. However, the operating cost savings resulting from the fuel efficiency improvement associated with compliant tractors and trailers is substantial. Staff estimates a compliant tractor-trailer combination will save between \$4,000 and \$5,700 in fuel costs every year. To some extent, the transportation industry has recognized the benefits associated with improved aerodynamics. Most long-haul tractors have some aerodynamic features - roof fairings and fuel tank fairings are two examples. However, trailer aerodynamics has lagged woefully behind. Box-trailer design has not evolved much over the last 30 years. The trailers are designed to carry the largest possible load within federal and state size and weight limits. As a result, trailers are rectangular in shape, designed to take advantage of every inch allowed by the size limits, with little consideration given to aerodynamics. Staff believes the incorporation of aerodynamic

technologies on box-type trailers will not happen in a timely manner without regulatory impetus. Real and quantifiable near-term GHG reduction benefits will be lost if the proposed regulation is not implemented. As a result, staff has rejected the "No Action" option.

B. Expand Applicability

The proposed regulation was identified by staff in October 2007 as a discrete early action measure required to be adopted by the Board and made enforceable by January 1, 2010 (ARB, 2007). Key to its inclusion in the list of discrete early actions was the existence of the SmartWay program, which establishes technical specifications and requirements for compliant tractors and trailers. The applicability of the proposed regulation is inline with the applicability of the SmartWay program's technical specifications and requirements.

Throughout the regulatory development process environmental groups have suggested that the applicability of the proposed regulation should be expanded beyond the traditional long-haul configuration of tractor and trailer (Le., a sleeper cab tractor pulling a 53-foot or longer box-type trailer) to include box-type trailers of various lengths and types, and straight trucks. Their analysis indicates that requiring aerodynamic device retrofits and low-rolling resistance tires on all tractor-trailers pulling box-type trailers and straight trucks could get an additional 46 percent reduction in cumulative GHG emissions by 2020 (Schubert, 2008).

Staff agrees that additional GHG emission reductions can be gained by expanding the applicability of the proposed regulation beyond the proposed long-haul configuration tractors and trailers. But expanding the applicability of the proposed regulation in these areas would mean that it would be broader in scope than the applicability of the current SmartWay program. Expanding the applicability of the rule would require staff to develop an ARB tractor and trailer, tire rolling resistance, and aerodynamic technology approval and certification program. A certification testing protocol and certification procedure would need to be developed. This could not be accomplished in the timeframe allotted to develop the proposed regulation. As a result, staff did not expand the applicability of the proposed regulation. However, staff is committed to work with U.S. EPA SmartWay program staff and evaluate the feasibility of expanding the program in the near future

Below are listed some of the specific data needs associated with expanding the applicability of the proposed regulation that could not be addressed by staff within the regulatory development timeframe of the proposed regulation. These issues will be addressed by staff in the development of future regulations.

- Obtain additional test data to verify fuel economy improvements from aerodynamic technologies and low-rolling resistance tires on straight trucks, and other box-type trailers. For the proposed regulation, staff has relied on the U.S. EPA's published fuel economy benefits based on a Class 8 tractor pulling a 53-foot box-type trailer loaded to 65 percent of its gross vehicle weight rating

(52,000 lbs.) operated over three drive cycles representative of line-haul tractor-trailer operations (Bachman, 2005.) For different trailer sizes and tractor classes and vocations, the fuel economy benefits may be different and would need to be verified through testing.

- Obtain additional data on low-rolling resistance tire availability, off-road capability, and production capacity. Expanding the applicability of the low-rolling resistance tire requirement will increase the demand for these tires and result in them being used on tractors and trailers that travel off-road regularly, Le. log hauling.
- Obtain additional data on the synergistic effects of combining aerodynamic technologies on tractors and trailers. Staff relied on the fuel economy benefits established by the SmartWay program for combinations of aerodynamic devices. Requiring all available aerodynamic technologies on all trailers goes beyond the requirements of the SmartWay program. Staff needs to verify the fuel economy benefits of such an approach through additional testing.

XI. ENVIRONMENTAL IMPACT

The proposed regulation is driven by the need to reduce GHG emissions from the transportation sector and specifically from on-road HDVs. The reductions are expected to be achieved through the accelerated introduction of new aerodynamically styled fuel efficient tractors and trailers and the retrofit of existing tractors and box-type trailers with fuel efficient aerodynamic and tire technologies.

Staff expects implementation of the regulation to result in significant GHG emission reductions and to a lesser extent oxides of nitrogen emission reductions, and does not anticipate any significant adverse public health or environmental impacts associated with the proposed regulation. The following sections discuss the environmental impacts associated with the proposed regulation.

A. Legal Requirements

The California Environmental Quality Act (CEQA) and ARB policy **require** an analysis to identify the potential environmental impacts of proposed regulations and to mitigate significant effects whenever it is feasible to do so. Since ARB's program involving adoption of regulations has been certified by the Secretary of Resources as meeting certain environmental standards set forth in CEQA, the CEQA environmental analysis requirements may be included in the Initial Statement of Reasons (ISOR or Staff Report) for this rulemaking in lieu of following the CEQA format of an Initial Study and Negative Declaration, and Environmental Impact Report (see Public Resources Code, section 21080.5). In addition, ARB staff will respond, in the Final Statement of Reasons for the regulation, to all significant environmental issues raised by the public during the public review period or at the Board public hearing.

Public Resources Code section 21159 requires that the ARB's environmental impact analysis include the following:

- An analysis of the reasonably foreseeable environmental impacts of the **methods** of compliance;
- An analysis of reasonably foreseeable mitigation measures; and
- An analysis of reasonably foreseeable alternative means of compliance with the regulation.

The proposed regulation is designed to reduce GHG emissions from long-haul combination trucks. The reductions are needed to reduce global warming which poses a threat to the public health, natural resources, economic well being, and the environment of California as required by AB 32.

Alternatives to the proposed regulation are discussed in Chapter X of this report. ARB staff has concluded that there are no alternative means of compliance that would achieve similar GHG emission reductions at a lower cost.

B. Reasonably Foreseeable Environmental Impacts

Staff has identified air quality benefits and minimal negative environmental impacts of compliance with the proposed regulation.

1. *Estimated GHG Benefits*

The GHGs associated with diesel exhaust are CO₂, methane, and nitrous oxide, with CO₂ being the major component of the three. Since CO₂ is emitted in direct proportion to the fuel combusted, any reduction in CO₂ emissions requires reduction in the fuel burned to propel the vehicle. The proposed regulation would reduce GHG emissions by reducing the fuel consumption of HDVs achieved through improvements in aerodynamic drag and tire rolling resistance. The GHG reductions would contribute towards attaining AB 32 goals for the year 2020.

Equation XI-1 was used to calculate the GHG reductions from the proposed regulation.

$$\text{CO}_2\text{e Reduced} = \text{Fuel Savings} * \text{EF} / 1000 \quad (\text{Equation XI-1})$$

Where: CO₂e Reduced = average annual reduction in GHGs in metric tons CO₂e
 Fuel Savings = Annual fuel savings in gallons per year
 EF = GHG emission factor from diesel fuel combustion (10.4 kilograms CO₂e per gallon of diesel fuel (ARB, 2008c))
 1000 = Conversion factor from kilograms (kg) to metric tons (1000 kg = 1 MT)

Annual Fuel Savings: The annual fuel savings is determined from the percent fuel efficiency improvement, annual VMT, and the baseline fuel economy.

Percent Fuel Efficiency Improvements: The percent fuel efficiency improvements used to quantify the GHG benefits are shown in Table XI-1. These were determined based on the minimum aerodynamic and tire rolling resistance performance

requirements specified in the proposed regulation. For example, the proposed regulation would require a minimum fuel efficiency improvement of 3 percent from low-rolling resistance tires on the combined tractor and the trailer, a minimum of 4 percent from trailer side skirts, and a minimum of 1 percent from front or rear gap fairings on dry-van trailers. Thus, for this example, an in-use pre-2011 model year tractor pulling a dry-van trailer would achieve an overall fuel efficiency improvement of 8 percent, as shown in Table XI-1.

The fuel efficiency improvements of currently certified aerodynamic devices are determined from track tests conducted at speeds of 60 to 62 miles per hour according to "SAE J1321 Type II" test procedures. These aerodynamic devices also reduce drag at lower speeds, though to a lesser extent, since aerodynamic drag varies with the square of the vehicle speed.

Annual VMT: The annual VMT applicable to tractors pulling 53-foot or longer box-type trailers was determined using the methodology described in Chapter VI. However, the resulting total VMT cannot be directly applied to the fuel efficiency improvements shown in Table XI-1, since the VMT is accrued at various speeds, while the fuel efficiency improvements are determined at speeds of approximately 60 miles per hour. Thus, the speed-VMT distribution of the impacted tractors and fuel efficiency improvements at different speeds are needed in order to accurately quantify the GHG emission benefits. However, such data were not available and therefore staff estimated the GHG benefits using only the VMT accrued at highway speeds, without taking into account benefits that occur at lower speeds. Accordingly, for non-neighboring out-of-state tractors, staff assumed 85 percent of the VMT to be at highway speeds, since these tractors travel long distances, spending the majority of their VMT at highway speeds. For neighboring out-of-state, California interstate, and California intrastate tractors, staff assumed 75 percent of the VMT to be at highway speeds, benefiting fully for 75 percent of the VMT from the aerodynamic devices.⁹

⁹ This assumption is consistent with assumptions made by other studies. For example, a report by Rocky Mountain Institute indicates 75 percent of the VMT is at highway speeds. (Ogburn, 2007).

Table XI-1: Fuel Efficiency Improvements - Based on Proposed Requirements

	Tractor Improvements	Trailer Improvements¹⁰	Fuel Savings
1,	2011+ model year SmartWay certified sleeper cab tractor (3.5%)	Dry-van trailer - SmartWay certified or retrofitted with side skirts and front gap fairings (6.5%)	10.0%
2	2011+ model year SmartWay certified sleeper cab tractor (3.5%)	Refrigerated-van trailer - SmartWay certified or retrofitted with side skirt (5.5%)	9.0%
3	2011+ model year day cab tractors and all pre-2011 model year in-use tractors - Tire Improvements (1.5%)	dry-van trailer - SmartWay certified or retrofitted with side skirts and front gap fairings (6.5%)	8.0%
4	2011 + model year day cab tractors and all pre-2011 model year in-use tractors - Tire Improvements (1.5%)	Refrigerated-van trailer - SmartWay certified or retrofitted with a side skirt (5.5%)	7.0%

Baseline Fuel Economy. Staff also used model year specific baseline fuel economy values to estimate the fuel savings from the proposed regulation. The fuel economy values used are developed by ARB staff and are applicable for on-road HDVs operating in California (See Appendix C for a discussion of the development of fuel economy values for HDVs).

For the purposes of quantifying the emission reductions, staff also assumed that all fleets will adopt the large fleet trailer compliance plan which provides a compliance option for in-use pre-2011 trailers based on a phase-in schedule specified in Appendix F of this report. Staff also assumed that in the absence of the proposed regulation, 20 percent of the tractors sold each year from ,201 0 to 2020 would be SmartWay certified and 25 percent of the in-use' pre-2011 model year tractors would use fuel efficient tires.

The GHG emission benefits were calculated for the years 2010 to 2020 based on VMT accrued within California and nationwide. Table XI-2 summarizes the 2010, 2015, and 2020 statewide and nationwide GHG emission benefits of the proposed regulation. Staff estimates that from 2010 to 2020, as new fuel efficient tractors and trailers are introduced and in-use ones retrofitted with fuel efficient technologies, GHG emissions will be reduced by a cumulative total of approximately 8 MMT CO₂e statewide and approximately 52 MMT CO₂e nationwide. The 2020 benefits are approximately 1 MMT CO₂e statewide and 6 MMT CO₂e nationwide. Figure XI-1 shows the statewide

¹⁰ The trailer aerodynamic technologies specified in the table are meant for illustration purposes. Fleets can meet the requirements using other aerodynamic technologies that meet or exceed the minimum performance requirements.

baseline and controlled GHG emissions for calendar years 2010 to 2020. As seen in Figure XI-1, GHG emissions from long-haul tractors continue to increase even with implementation of the proposed regulation because the trucking industry will grow substantially between now and 2020 (ARB, 2008a).

Table XI-2: 2010, 2015, and 2020 GHG Emission Benefits - Statewide and Nationwide (MMT CO₂e)

Calendar Year	California		Nationwide	
	Baseline	Reductions	Baseline	Reductions
2010	8.5	0.2	55.6	0.9
2015	10.1	0.8	65.7	5.5
2020	11.4	1.0	74.6	6.7

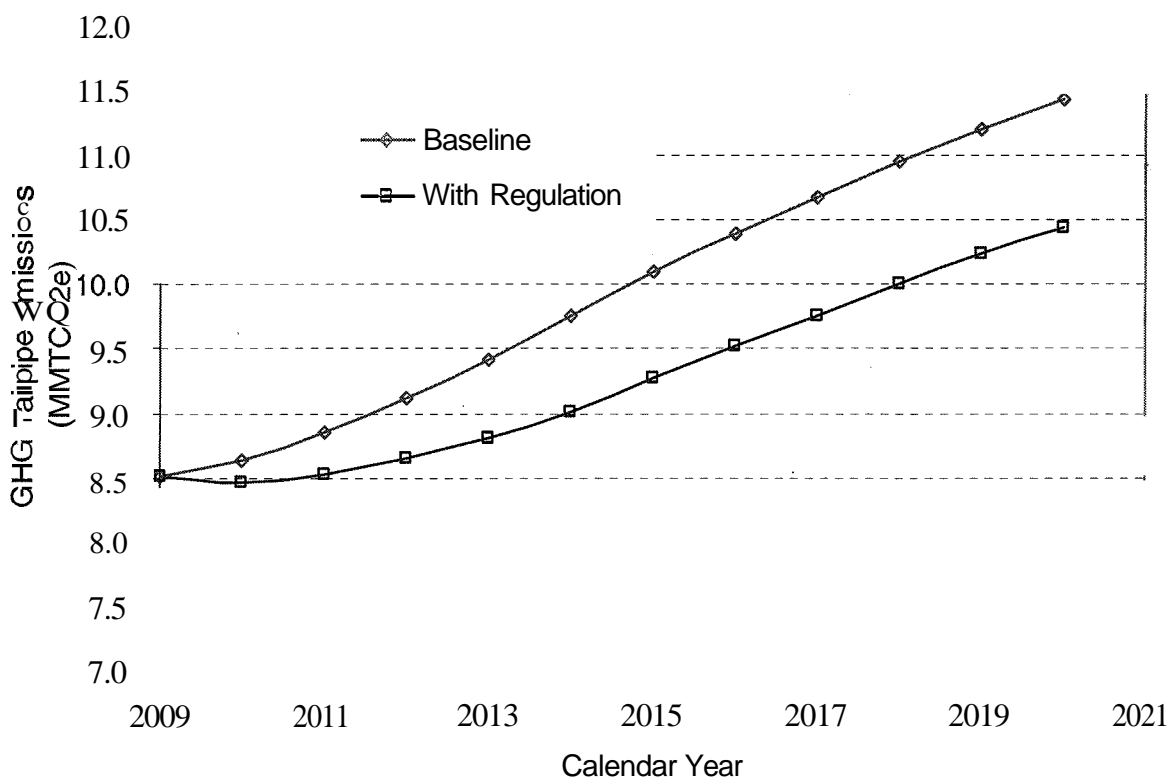


Figure XI-1: Statewide GHG Emissions With and Without the Regulation

2. *Estimated Oxides of Nitrogen (NOx) Emission Benefits*

In addition to GHG benefits, reducing aerodynamic drag and rolling resistance also reduces NOx emissions (Bachman, 2005; Bachman, 2006). Thus, the proposed regulation is expected to provide NOx emission reduction benefits that would contribute towards attainment of ambient air quality standards for ozone. Staff used the methodology specified in the U.S. EPA SmartWay State Implementation Plan (SIP) and Transportation Conformity guidance document (U.S. EPA, 2007) to quantify the NOx emission benefits from the proposed regulation.

Because the effects of the SmartWay technologies on NOx emissions of trucks with particulate matter and NOx aftertreatment controls is not yet determined, the U.S. EPA recommends that, for SIP and conformity determinations, the NOx reductions not be applied to trucks of model years newer than 2006. Furthermore, the NOx emission reductions associated with SmartWay retrofit applications vary by speed, requiring the VMT to be distributed by speed. Since speed distribution data for the fleet that is impacted by the proposed regulation were not available, staff made the following assumptions on VMT-speed distribution of long-haul tractors. That is, for non-neighboring out-of-state tractors, staff assumed 85 percent of the VMT to be at highway speeds and a corresponding NOx reduction of 9.5 percent. For the remaining 15 percent of the VMT staff assumed an average speed of 35 miles per hour and a NOx reduction of 4.6 percent. For California intrastate, California interstate, and neighboring out-of-state tractors, staff assumed 75 percent of the VMT to be at highway speeds and a corresponding NOx reduction of 9.5 percent. For the remaining 25 percent of the VMT, staff assumed an average speed of 35 miles per hour and a corresponding NOx reduction of 4.6 percent. Based on these assumptions and U.S. EPA guidelines, California specific NOx reductions were estimated to be 4.3 and 1.4 tons per day in 2014 and 2020 respectively. These reductions assume a "business as usual" scenario, where they do not take into account the impact of other proposed regulations that would impact NOx emissions.

3. *Potential Negative Impacts*

Staff has identified one potential negative impact resulting from the proposed requirement to use fuel efficient tires. Waste tires may increase during the phase-in periods because fleet owners, in order to comply with the proposed requirements, may be forced to replace usable tires before the end of their useful life. If not managed properly, waste tires can cause serious public health risks and environmental problems, such as fires, air and groundwater contamination resulting from burning tires, providing habitats for vector breeding, and reduction of landfill capacity.

Staff believes the proposed requirement would result in minimal or no increase in tire waste for the following reasons. The proposed regulation requires that in-use 2010 and older model year tractors use fuel efficient tires by January 1, 2012, giving fleet owners 2 years to comply with the requirements. It also provides in-use 2010 and older model year trailers the option to meet the proposed requirements during a 6-year phase-in period by January 1, 2016. For long-haul operations, fleets normally replace old steer tires with new tires once every year. Thus, replacing steer tires with new fuel efficient

tires during the two-year phase-in period will not result in increased tire waste since the replacement can be done at the end of the tire's normal life. Drive tires, depending on the fleet's tire maintenance program, may be replaced with new tires once every one to two years, or recapped once or twice during their lifetime and reused as drive or trailer tires. Thus, similar to the steer tires, the drive tires replaced with new fuel efficient tires during the two-year compliance period would not result in increased tire waste since replacement can occur at the end of the tire's normal life. Retreaded drive tires that would have been reused as drive tires, but because of the proposed requirements are now replaced with new fuel efficient tires, could also be used as trailer tires or sold to out-of-state fleets or for use on tractors and trailers not affected by the proposed regulation, resulting in no increase or minimal increase in tire waste. Trailer tires are normally retreaded and reused multiple times. However, the proposed regulation provides a phase-in period of six years for fleets to comply with the trailer retrofit requirements, providing enough time to retread and reuse trailer tires before they are forced to replace them with fuel efficient tires. Trailer tires that cannot be reused in California but have remaining life for retread could also be sold to out-of-state fleets, thus minimizing tire waste.

C. Reasonably Foreseeable Mitigation Measures

ARB staff has concluded that no significant adverse environmental impacts should occur from adoption of and compliance with the proposed regulation. Therefore, no mitigation measures would be necessary.

D. Alternative Means of Compliance with the Proposed Regulation

Alternatives to the proposed regulation are discussed in Chapter IX of this report. ARB staff has concluded that the proposed regulation provides the most effective and least burdensome approach to reducing GHGs from on-road HDVs.

XII. COST AND ECONOMIC IMPACT

A. Summary

AB 32 requires that climate change regulations must consider the impacts on the economy of the state. The consideration should include, but not be limited to, the impacts of the regulations on jobs and businesses, and California business competitiveness. The regulations must take into account the impacts on local communities with minority/low-income populations, and affiliated businesses. This section discusses the economic methodology and cost impacts staff anticipates from implementation of the proposed climate change regulation on the California economy. The results are intended to provide an overall picture of the economic impacts on the economy although an individual business or consumer may experience different impacts than anticipated.

The cost analysis was computed based upon an 11-year equipment lifespan, from 2010 to 2020. Over that time span, staff expects a net savings of approximately \$4.3 billion to the affected stakeholders in 2008 dollar values. During the first six years of

implementation from 2010 to 2015, an estimated net savings of \$3.5 billion is expected. The net savings will be realized by truck operators because of improved fuel economy. Businesses that own only trailers and no tractors may not be able to recover the cost of retrofitting their trailers through fuel savings, and therefore, they may need to recover their investment by paying less to haulers or by passing it on to customers by increasing the cost of their merchandise. Ultimately, the substantial operating cost savings seen by the truck haulers should result in lower costs to ship goods and result in lower cost for consumers. Staff calculated the savings based upon the projected retail price per gallon of ultra low sulfur diesel fuel of \$3.14 in 2010 to \$3.69 in 2020.¹¹ However, staff believes this may be a conservative estimate of the savings since recently the California average retail price for diesel fuel was about \$4.00 per gallon.¹² At \$4.00 per gallon, the lifetime savings of the regulation (over the 11-year lifespan of the equipment) would be about \$8.5 billion.

The GHG emission reductions from the proposed rule for all affected vehicles traveling in and out of California are estimated at 6.7 MMT CO₂e in 2020. An emission benefit of approximately 1 MMT CO₂e or 15 percent would occur within California. The proposed rule is also expected to achieve NO_x reductions. The U.S. EPA State Implementation Plan (SIP) guidelines for implementation of aerodynamic devices on heavy-duty trucks and trailers approved through the SmartWay program estimates NO_x reductions ranging from 2 to 10 percent per vehicle, depending on speed. Based on the guidelines, in addition to the GHG benefits, the proposed measure would result in a statewide NO_x emission reduction of about 4.3 tons per day (tpd) in 2014¹³ and 1.4 tpd in 2020.

B. Legal Requirements

The legal requirements for an economic analysis are included in the Government Code sections 11346.3 and 11346.5 and the Health and Safety Code section 57005. These statutes require all State agencies do an assessment of the potential adverse economic impacts on California business enterprises and individuals when any regulation is proposed, adopted, or amended. The assessment must include at a minimum, consideration of the impact of the proposed regulation on California jobs, business expansion, elimination or creation, and the ability of California businesses to compete with businesses in other states. State agencies also are required to estimate the cost or savings to any State or local agency and school district, in accordance with instructions adopted by the Department of Finance. The estimate shall include any non-discretionary cost or savings to local agencies and the cost or savings in federal funding to the State. The ARB must also perform an economic impact analysis of submitted alternatives to a proposed regulation before adopting any major regulation. A major

¹¹ Integrated Energy Policy Report, California Energy Commission developed in 2007 and projected to 2020 (CEC, 2007).

¹² The United States Energy Information Administration tracks California retail diesel fuel price; on September 15, 2008, ultra low sulfur diesel was at \$4.05 per gallon (EIA, 2008).

¹³ 2014 is one of the target years for reducing emissions in the California SIP.

•

regulation is defined as a regulation that will have a potential cost to California business enterprises in an amount exceeding ten million dollars in any single year.

C. Methodology for Estimating Cost and Economic Impact

The cost-effectiveness analysis is based on estimates of expected emissions reductions and costs for implementation of the proposed regulation. The annual discounted capital costs and operating cost savings were calculated to determine the total annual costs or net savings. The incremental cost to purchase SmartWay certified aerodynamic devices and approved tires begins with the 2011 model year (2010 calendar year) and is incurred as a lump sum. Since the equipment may last for many years, the lump sum expenditure can be "spread-out" over the expected life of the equipment. Staff used the capital recovery method, also known as the amortization method, to spread the costs of the equipment and tires over their useful life at a specified interest rate.

The following formula (Linsley, 1977) is used to calculate the annualized cost of new and in-use equipment replacement:

$$AC = (ICE)(CRF)$$

Where:

AC = Annualized cost of equipment

ICE = Incremental consumer expenditure for equipment

CRF = Capital recovery factor = $\frac{i(1+i)^n}{(1+i)^n - 1}$

Note that "i" in the CRF formula represents the interest rate (or "opportunity cost") for the incremental consumer expenditure, while "n" represents the equipment life. By using the capital recovery factor method, the equipment's annual depreciation and the opportunity cost is accounted for.

Annual capital cost values of the affected population of tractors and trailers were calculated by multiplying the projected population for each year by the incremental cost of the required aerodynamic equipment and tires in that year. The affected population represents the projected number of tractors sold in that year generated from the ARB's inventory. The trailer population was determined by using a trailer-to-tractor ratio of 2.5 to 1. Annualized costs are estimated using a real interest rate of 5 percent. All these costs are predictions of future prices, which could vary noticeably depending on demand, competition, and economic conditions, among other factors.

D. Estimated Costs of the Proposed Regulation

Staff estimated aerodynamic device and tire costs from currently available retail prices, fleet price quotes; and equipment manufacturer prices for new and in-use SmartWay trucks and trailers. The low, average and high cost estimates for the required equipment tires are shown in Table XII-t. Staff assumed in absence of the regulation, 20 percent of the new tractors sold would be SmartWay certified and 25 percent of new day cabs and in-use sleepers would use fuel efficient tires. In staff's analysis, it was assumed that without the regulation, affected trailer owners would not purchase

SmartWay certified trailers nor retrofit their existing trailers. This is based on conversations with manufacturers of SmartWay aerodynamic equipment who stated that very few fleets had SmartWay equipped trailers. In addition, fleets that had purchased aerodynamic trailer equipment mostly did so because they were awarded grant funding:

Staff assumed that the tractor would be equipped with fuel tank fairings, cab side extenders, an integrated sleeper cab roof fairing, aerodynamic bumpers and mirrors, and low-rolling resistance tires. The lower price estimate for new sleeper cab equipment was based on selecting lower cost SmartWay aerodynamic component options, some of which now come standard on new sleeper tractors. Also, depending on the manufacturer, the aerodynamic package for new sleepers may include components that may not necessarily be needed to meet the minimum requirements for the proposed regulation, thereby providing even more benefits than estimated.

The trailer would be equipped with side skirts and front or rear fairings. Both the tractor and trailer are assumed to have SmartWay approved tires. Staff did not include any incentive or grant funds that may be available to offset the purchase of the proposed technologies, although these programs can provide a significant reduction in capital outlay and are discussed in section 1.1 of this chapter - Summary of Current Financial Assistance and Grant Programs.

Table XII-1: Tractor and Trailer Costs

Category	Low	Average	High
New Sleeper	\$1,100	\$2,100	\$3,000
Trailer	\$1,900	\$2,900	\$4,200
Tractor & Trailer	\$3,000	\$5,000	\$7,200

The estimated tire cost differentials for a conventional heavy-duty tire versus a SmartWay approved tire ranged from \$0 to \$50. For the tire cost analysis, staff assumed that the typical long-haul tractor has two steer tires and eight drive tires. Staff assumed the trailer has eight tires.

As noted in the technology discussion, SmartWay approved tire technology has made improvements to both the casing and tread design over the years, and may now last as long as conventional tires. Based on this, staff assumed that the steer tires will last one year, the drive tires will be replaced every two years, and the trailer tires would last four years and then be retreaded. One retread was assumed for the tractor drive tires and two retreads for the trailer tires. Some fleets may retread the tires as long as the casing lasts. Staff also spoke with retreaders that stated that there was no cost difference between retreads for a low-rolling resistance tire versus a conventional tire. The retreader also stated that the retread cost was based on the amount of rubber used and that a low-rolling resistance tire could be less expensive to retread since this tire typically does not have a tread depth as thick as a conventional tire. Also, some fleets noted that they will continue to use tires with tread left and then switch these tires from the steer position to drive position to trailer tire positions to reduce tire purchasing costs;

staff did not account for these additional savings in the cost analysis. From meetings with various fleets, it was noted that fleets have a variety of tire replacement practices.

Staff included maintenance costs and administrative fees, as shown in Table XII-2. No incremental maintenance cost for tires was included since it is assumed that a fuel efficient low-rolling resistance tire would be maintained in the same manner as a conventional tire.

Many fleets noted that, in general, neither the tractor nor trailer aerodynamic devices required any additional annual maintenance. However, to be conservative, staff included an annual maintenance and inspection cost of \$143.00 based on the repair and replacement of a fiberglass panel for one out of every ten tractors. Most of the fleets indicated that the maintenance needed for tractor fairings was minimal. Damage to trailer side skirts was more common because of loading, environmental conditions, and driver errors. For trailer maintenance and repair, staff included a cost of \$120.00 per year. This is an average of \$170 per year (about 10 percent of the cost of a side skirt) reported by one fleet that used trailer skirts in a very harsh environment of snow and ice; and \$75 per year from a 2.5 year maintenance study of 20 trailers (Freight Wing, Inc., 2008).

The proposed regulation specifies reporting requirements for short-haul tractors and trailers, and in-use trailer compliance schedules. Included in the overall cost is an estimated annual \$500 per fleet for trailer reporting cost during the first five years of the proposed regulation. The fees are meant to account for the record keeping, tracking of California compliant tractors/trailers, updating of contract/legal fees, inspection costs for freight companies and shippers, and administrative costs during implementation.

Table XII-2: Annual Maintenance Costs/Fees

Item	Low	Average	High
Tractor	\$30	\$143	\$233
Trailers	\$75	\$120	\$166
Contract Administration Fees	0	\$3.50Tractor \$5Trailer	\$5

Using the above costs, staff estimates that for the industry as a whole, the lifetime capital cost of complying with the proposed regulation would be about \$10.4 billion and the cost savings over the same period of time would be \$14.7 billion. This yields a net cost savings of almost \$4.3 billion. On an annualized basis, the average cost savings over the lifetime of the proposed regulation would be about \$0.4 billion per year from 2010 to 2020 (2008 dollars). However, at a retail diesel fuel price of \$4.00 per gallon, net cost savings would increase to about \$8.5 billion or \$0.8 billion per year from 2010 to 2020.

Approximately 9 percent of the affected tractor and trailer population are based in California. The total estimated statewide lifetime cost for California based tractors and trailers to comply is about \$0.5 billion, and the cost savings over the same period of

time are \$1.1 billion. This yields a net statewide cost savings of almost \$0.6 billion. This net cost savings would be realized by California fleet operators and owner operators of compliant tractors and trailers and are directly attributed to operating cost savings associated with improved fuel economy.

On a per vehicle/equipment basis, the total operating cost savings per year ranges from approximately \$5,400 to \$3,700 as shown in Table XII-3. The cost of add-on devices would, on average, be \$5,000 (Table XII-1), making the cost recovery period less than 1.5 years.

Table XII-3: Annual Operating Cost Savings

Vehicle/Equipment	Fuel Savings (gallons/year)	Fuel Cost Savings¹ (\$/year)	Maintenance Cost (\$/year)	Total Savings¹⁴ (\$/year)	Fuel Savings
New Sleeper Cab & Trailer Combination	-1,819	-\$5,704	\$263	-\$5,441	10.0%
New Sleeper Cab & Refrigerated Trailer Combination	-1,737	-\$5,133	\$263	-\$4,870	9.0%
In-Use Sleeper Cab/New Day Cab & Trailer Combination	-1,455	-\$4,563	\$263	-\$4,300	8.0%
In-Use Sleeper Cab/New Day Cab & Refrigerated Trailer Combination	-1,273	-\$3,993	\$263	-\$3,729	7.0%

¹ The estimated fuel cost is \$3.14 per gallon in 2010, sourced from the Integrated Energy Policy Report of the California Energy Commission in 2007 (CEC, 2007).

Staff expects that the increased production of the aerodynamic equipment needed to meet the proposed regulation would help to lower future purchase costs as economies of scale are realized. Also, staff expects additional manufacturers of approved aerodynamic equipment to enter the marketplace, providing more competitive pricing. As mentioned previously, businesses that own only trailers and no tractors may not be able to directly recover the cost of retrofitting their trailers through fuel savings, and therefore, they may need to recover their investment either by paying less to haulers who receive the direct fuel economy benefit or by passing it on to customers by temporarily increasing the cost of their merchandise.

¹⁴ The assumptions for this calculation are as follows: a baseline fuel economy of 5.8 miles per gallon, an average long-haul mileage accrual rate of 125,000 miles per year, 84 percent of the vehicle miles traveled at highway speed that benefit fully from the aerodynamic devices, and a projected diesel fuel cost of \$3.14 per gallon. If the cost per gallon in diesel fuel is higher than \$3.14, the fuel savings due to the proposed regulation would be proportionately greater.

For instance, due to high fuel prices, some motor carriers are charging a fuel surcharge per truckload; however, a company with a dry-van meeting the rule's requirements should incur a lower fuel surcharge. A retrofitted dry-van will increase the fuel economy of the tractor pulling it on average by 6.5%. Therefore, it would be reasonable for a company that hires a motor carrier to haul their retrofitted or SmartWay certified trailer to negotiate a proportional reduction in the freight rate.

E. Potential Impact on a Small Business

Most businesses that operate long-haul tractors and trailers are not considered small businesses because they generate revenues where the transportation and warehousing annual gross receipts exceed \$1.5 million (Government Code 11342.610) particularly when they own multiple tractors and operate multiple shifts. Similarly, logistics companies are typically not considered small businesses. These organizations, however, may contract with small fleets and truck owner-operators that could be classified as small businesses.

Based upon transportation revenue estimates, staff developed a "small fleet" definition (see Appendix F). A small fleet could own up to 8 tractors and 20 trailers using the "small fleet" definition. The typical fuel savings projected for one year for one tractor-trailer combination is \$3,700 to \$5,400, so the payback for an expensive option of purchasing a new SmartWay tractor (versus not SmartWay), and retrofitting a trailer is less than 1.5 years.

The notice of public hearing issued in conjunction with this staff report included a statement on page 7 that staff assumed that a small business owner did not own any trailers. This statement in the notice was in error; as noted in this section of the staff report, ARB's analysis considers that companies owning as many as 20 trailers may be small businesses, and the regulation specifically provides that those owning up to this number of trailers may utilize a "small fleet compliance schedule." This misstatement had no effect on staff's economic analysis or on ARB's determination as stated in the notice that the proposed regulatory action would affect small business.

Staff assumed that most owner-operators will fall under the small business definition. The Owner Operator Independent Drivers Association (OOIDA) has a California membership of about 5,600 (OOIDA, 2004). According to OOIDA, about 50 percent of their members are involved with long-haul, and of these 28 percent operate dry-vans and refrigerated-vans that could be affected by the regulations. According to the OOIDA survey, 15 members own, on average, 1.5 tractors; 82 percent own only one tractor. About 40 percent of owner-operators purchase their tractors new and 60 percent purchase their tractors used. About 53 percent own trailers and those that do own trailers have, on average, two trailers. Based on these statistics, the cost of compliance will vary as shown in Table XII-4 below:

15 Not all owner-operator truck drivers are members of OOIDA. Therefore, the survey results discussed may not apply to all owner-operators.

Table XII-4: Owner-Operator Compliance **Costs**

Owner-Operator Equipment Configuration	Equipment Needs	Cost per One Tractor-Trailer Combination	Cost per Owner-Operator with 1.5 Tractors and 2 Trailers
Owns used tractor	Upgraded tractor tires	\$0 to \$500	\$0 to \$750
Owns used tractor and trailer	Upgraded tractor tires, retrofit trailer	\$2,900 to \$3,400	\$5,800 to \$6,500
Purchases new SmartWay tractor, owns trailer	SmartWay tractor, retrofit trailers	\$5,000	\$9,000

Outside of California, based on the OOIDA market survey, there are approximately 160,000 owner-operator businesses (OOIDA, 2004). Of these, staff estimated that there are about 18,000 long-haul owner-operator businesses that operate dry-vans and refrigerated-vans that may be subject to the proposed rule.

F. Potential Impact on Employment, Business Creation, Elimination, or Expansion

There are modest up-front costs associated with the proposed regulation before fuel efficiency gains occur. It is possible that some very marginal trucking companies would not be able to finance the required upgrades. Financial assistance and grant programs will be available to assist these businesses. Fuel costs have been shown to have a direct correlation to the survivability of many long-haul transport businesses, and this proposed regulation is expected to provide a net fuel savings once the required equipment is installed.

The regulation should result in an increased demand for aerodynamic devices and low-rolling resistance tires. This in turn may result in the creation or expansion of some businesses as a result of manufacturing, distributing, and marketing of these devices. The increased demand in approved aerodynamic devices may also result in the creation of some new jobs related to research and development for further improvement of these devices.

Most of these types of jobs are expected to be located near chassis or trailer manufacturing facilities located outside of California, although some will be created in California dealerships and maintenance facilities. New jobs for maintaining/replacing aerodynamic devices may also be created.

The regulation is not expected to affect the ability of California businesses to compete with other states by making it more costly to produce goods or services because the proposal affects both interstate and intrastate long-haul freight distribution. In addition, most of the tractors and trailers affected by the proposed regulation are owned by businesses located outside of California.

G. Estimated Costs to Local, State, and Federal Agencies

The proposed regulation is not expected to have any impact on local public agencies. However, there would be a cost to the State for additional staff to provide the ongoing regulatory development, implementation, and enforcement of the regulation. The costs for the additional staff would be approximately \$3,613,223 in fiscal year 2009-2010 (this includes one-time contract and equipment costs). In fiscal year 2010-2011 and going forward, the cost to the State would be \$6,494,463 annually (in 2008 dollars). The total costs for fiscal years 2009-2010 and 2010-2011 are shown in Table XII-5.

Table XII-5: Fiscal Year Costs for State Agencies

Fiscal Year	State Cost (2008 \$)
FY: 2009 - 2010	\$3,613,223
FY: 2010 - 2011	\$6,494,463

The cost is based on 20 new staff to conduct ongoing regulatory development and program implementation and 11 staff for enforcement of the regulation. The need for 20 new positions was estimated based on the number of staff it has taken to develop and implement similar rules.¹⁶ It is envisioned that there would be a significant amount of coordination and program development work with U.S. EPA SmartWay staff. The proposed program would be dynamic in nature, meaning that regulatory amendments are expected to be routinely brought before the Board for approval as the program is expanded to include new aerodynamic components, trucks, and trailers. Given that the heavy-duty truck fleet accounts for 20 percent of the GHG emissions from the transportation sector (or 36 MMT CO₂e), expansion of the program is not only expected, but vitally needed.

Because ARB's enforcement staff already has major commitments to other diesel regulations, it is expected that existing staffing levels will not be adequate to meet the increased demand for inspections and other enforcement activities. Staff anticipates additional inspectors will be required to conduct an enforcement program involving field

¹⁶ Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling, Title 13, Section 2485; Regulation for In-Use Off-Road Diesel Vehicles, Title 13, Sections 2449, 2449.1, 2449.2 and 2449.3

inspections, office investigations, and case development for the affected population of over 400,000 tractors and over 1 million trailers. A robust enforcement program is necessary to assure a level playing field for those that comply, and to assure the GHG emission reductions are achieved.

Staff does not expect any costs to federal agencies as these agencies typically contract out for long-haul freight services.

H. Cost-Effectiveness of the Proposed Regulation

The basic methodology ARB staff uses to determine cost-effectiveness of a regulation is to determine what costs are involved to comply with the proposed regulation and to compare those costs to the emission reduction benefits to the public. Since the proposed regulation would result in an overall savings to the affected industry, it would be cost effective.

This regulation would result in an estimated CO₂ benefit of approximately 1 MMT CO₂e in California and 6.7 MMT CO₂e nationwide in 2020. In addition, the regulation is estimated to provide NO_x emission reductions of about 4.3 tons per day (tpd) in 2014 and 1.4 tpd in 2020.¹⁷

The regulation would provide a cost savings of \$4.3 billion. The annualized net savings are the cost savings for the tractors and trailers subject to the regulation from 2010 to 2020, as shown in Table XII-6. On an average annualized basis, this is equivalent to an operating cost savings of about \$0.4 billion per year over the 11 years.

Table XII-6: Average Annualized Cost Savings

Model Year	Cumulative Annual Capital Costs	Annual Operating Cost Savings	Net Savings Total
2010	\$71,994,512	-\$586,464,631	-\$514,470,120
2011	\$233,058,924	-\$809,739,777	-\$576,680,853
2012	\$411,434,088	-\$1,176,648,403	-\$765,214,315
2013	\$613,503,052	-\$1,292,353,131	-\$678,850,079
2014	\$822,210,899	-\$1,361,253,981	-\$539,043,082
2015	\$1,040,505,088	-\$1,423,881,061	-\$383,375,973
2016	\$1,169,863,202	-\$1,477,348,117	-\$307,484,915
2017	\$1,300,497,855	-\$1,538,439,022	-\$237,941,167
2018	\$1,435,448,768	-\$1,585,812,457	-\$150,363,689
2019	\$1,572,800,765	-\$1,666,974,913	-\$94,174,148
2020	\$1,727,329,806	-\$1,755,052,155	-\$27,722,349
Total Savings	\$10,398,646,958	-\$14,673,967,648	-\$4,275,320,691

¹⁷ U.S. EPA methodology entitled, "SmartWay SIP and Transportation Conformity Guidance: Accounting for NO_x Reductions from Trailer Aerodynamic Kits and Low-rolling Resistance Tires"

Total Savings over 6 year implementation	-\$3,457,634,422
Total Savings over 11 years to 2020 per AS 32	-\$4,275,320,691

I. Summary of Current Financial Assistance and Grant Programs

1. *Federal grants and state incentive programs*

a) *U.S. EPA: EPA's National Clean Diesel Campaign*

Under the Energy Policy Act of 2005, the Diesel Emissions Reduction Act (DERA) authorized \$200 million per year for 5 years for implementation of diesel emissions reduction projects. The U.S. EPA National Clean Diesel Campaign Program (NCDC) consists of the NCDC Grants and Funding Program and the State Clean Diesel Grant Program, with the first appropriation of \$49.2 million authorized by Congress in 2007. The NCDC includes the SmartWay Clean Diesel Finance Program. The programs provide technical assistance and grants to assist eligible partners to adopt diesel emissions reduction strategies. Grant opportunities are announced at the national level or via regional agreements such as Region 9 and 10 via the West Coast Collaborative (Federal Register & NCDC website).

b) *U.S. EPA SmartWay Partnership Financing Program*

The U.S. EPA SmartWay Finance Center provides a website to assist the trucking industry with the purchase of fuel savings and emissions reducing vehicles and technologies. This website works by bringing interested buyers and lenders together in one place. The interested tractor or tractor equipment buyer submits an application for an approved vehicle or technology, and interested lenders submit loan or lease offers to the applicant. The applicant decides which lenders he/she wants to work with, and **both** applicant and lender discuss the specific terms and conditions of each loan or lease.

In September 2008, U.S. EPA was awarded \$3.4 million in grants to provide financial assistance for truckers under the SmartWay Clean Diesel Finance Program. These loans will help small trucking firms lower their fuel costs and their carbon footprint by purchasing newer used trucks and idling and emissions reduction technologies. However, the loans and leases on this web site are limited to SmartWay certified vehicles and/or approved technologies and not available to the general public.

Information on financial institutions that provide loans for purchase of new or pre-owned tractors can be found at the following website: www.SmartwayFinanceCenter.com. The following provides SmartWay Program details from the U.S. EPA website:

- Interest rates: 5.5 to 8.5 percent, depending on, among other things, each applicant's business history, available collateral, cash flow, and credit score

- Loan payback period: 3 to 6 years, depending on, among other things, business history, available collateral, and cash flow
- Geographic location: Nationwide
- Eligible activities: Purchase used trucks that are already upgraded, or upgrade them with SmartWay or CARB verified idle reduction and/or emission reduction technology.
- Program Goal: Establish a revolving loan fund for the purchase of used trucks that have SmartWay upgrades or will receive SmartWay upgrades.
- Service fee: 2 to 3 percent

2. California incentive programs

While ARB's existing incentive grant programs, such as the Carl Moyer Program, have a proven success record in accelerating fleet turnover to newer, cleaner vehicles, funding opportunities for regulatory compliance are limited by statutory requirements to achieve surplus emission reductions, i.e., reductions that occur early and/or are in excess to what is required by regulation. As such, staff is currently developing an air quality loan program comprised of various financing options to provide an additional, more flexible financial assistance tool to regulated fleets.

The 2008-2009 fiscal year State budget contains a \$48 million appropriation to fund a heavy-duty vehicle air quality loan program to assist on-road fleets affected by staff's proposal and the proposed Truck and Bus Rule. In developing this air quality loan program, ARB staff is coordinating with the State Treasurer's Office (STO) to tailor a program to meet the specific needs of the heavy-duty vehicle sector.

One option being developed by ARB staff is a program with loan guarantees as the core component. Loan guarantees are advantageous for two primary reasons: 1) by reducing the financial risk to lenders, they create opportunities for borrowers that fall slightly below normal lending criteria and may not otherwise qualify for loans to obtain affordable financing packages; and 2) they provide an inherent benefit of fund leveraging to significantly increase the amount of funds available for direct loans to fleet owners. For example, the \$48 million budget appropriation could result in nearly \$340 million in competitive-rate loans to heavy-duty vehicle fleet owners, based on a seven-to-one leveraging ratio found in similar financing programs within the STO. In conjunction with loan guarantees, staff is evaluating other economic assistance tools to extend repayment periods and further reduce interest rates, as well as evaluating financial mechanisms that maximize State funds to create a large-scale, sustainable air quality loan program.

Because this loan program specifically supports the ARB's two proposed regulations for on-road heavy-duty vehicle fleets, ARB staff will update the Board

on the program at the same time the regulatory proposals are presented for Board consideration; funds should be available to assist fleets in early 2009.

a) *Assembly Bil/118*

Assembly Bill 118 (Nunez, 2007) created the Alternative and Renewable Fuels and Advanced Technology Program to be administered by the California Energy Commission, and the Air Quality Improvement Program to be administered by ARB. The Energy Commission program will have about \$120 million annually beginning in fiscal year 2008-2009, and is geared toward transforming California's fuel and vehicle types to help attain California's climate change goals. ARB will receive \$50 million annually to support clean air programs, and the first year appropriation is the source of the loan program funds described above. AB 118 provides the Energy Commission with over seven years in program funding. AB 118 requires that grants received pursuant to this program must achieve emission reductions that are early or go beyond what is required by regulation. ARB and the Energy Commission are currently developing guidelines and eligible project categories for their respective programs, with initial year project solicitations expected in mid-2009.

b) *Local Agency Programs*

Most Federal and State programs are administered by local agencies. In most cases, equipment operators should check with their local air district for funding opportunities, apply to, and be funded through them. Many local programs administered in conjunction with Carl Moyer funds operate under the title of "Heavy-duty Incentives" or similar. In the same manner, federal funding may be distributed through special programs like Sacramento Air Quality Management District's Emergency Clean Air and Transportation Program, supplemented by CMAQ (Congestion Mitigation and Air Quality) and state funds.

In addition, certain vehicle types and uses of trucks may have their own specially funded programs. The Ports of Long Beach and Los Angeles fund the Gateway Cities Clean Air Action Program fleet modernization plan via a combination of use fees (concession and container), Goods Movement and other matching sources. This program operates in conjunction with the San Pedro Bay Ports Clean Air Action Plan and Local Area Council of Governments, and anticipates replacing 16,000 trucks with newer used trucks over the next five years. Other agencies and jurisdictions may also have settlement and mitigation funds available for air quality improvement programs.

XIII. REQUIREMENTS OF AB 32

AB 32, at Health and Safety Code section 38560.5, requires that ARB adopt regulations by January 1, 2010 to implement discrete early action GHG emission reduction measures. These measures must "achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions" from the sources identified for early action measures. AB 32 contains additional standards in Health and Safety Code

section 38562 that apply to regulations that will be adopted for general emissions reductions consistent with ARB's scoping plan. Among other things, this section requires that reductions must be real, permanent, quantifiable, verifiable, and enforceable. ARB is also required to adopt rules and regulations in an open, public process. While section 38562 does not directly apply to early action items enacted under section 38560.5, ARB is interested in ensuring that its early action measures for GHG reductions such as those contained in this proposed regulation meet the broader criteria for the GHG reduction regulations that will follow. For that reason, these criteria are summarized here, with staff's assessment as to why the proposed regulatory action **meets** them or is not specifically applicable to them.

The proposed regulation would reduce GHG emissions by improving long-haul heavy-duty vehicle fuel efficiency. This improvement in fuel efficiency would be accomplished through the required use of aerodynamic technologies and low-rolling resistance tires. Below is a discussion of why staff believes the proposed regulation meets the requirements of State law.

1. *The State Board shall adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reduction from sources or categories of sources.*

The proposed regulation was developed in consultation with affected parties in an open, public process. ARB staff conducted numerous outreach efforts to inform affected parties of the proposal and to obtain stakeholder comments. Outreach efforts included public workshops, individual meetings, and email and telephone contacts. See Chapter III, Public Outreach and Environmental Justice, for a description of the public process.

2. *Design the regulations, including distribution of emissions allowances where appropriate, in a manner that is equitable, seeks to minimize costs and maximize the total benefits to California, and encourages early action to reduce greenhouse gas emissions.*

The proposed regulation requires the use of U.S. EPA SmartWay approved aerodynamic technologies and low-rolling resistance tires on long-haul heavy-duty vehicles. Long-haul heavy-duty vehicles are the focus of the proposed regulation because GHG emission benefits resulting from the use of aerodynamic improvements are maximized when vehicles travel a majority of their miles at highway speeds. Heavy-duty vehicles that travel a majority of their miles at slower speeds, e.g., short-haul delivery vehicles, are exempted from the regulatory requirements.

The proposed regulation would apply equally to California-registered and out-of-state registered long-haul heavy-duty vehicles. All long-haul vehicles (heavy-duty tractors pulling 53-foot or longer box-type trailers) subject to the requirements would need to comply, regardless of state or country of registration. The proposed regulation would also establish requirements for drivers and owners of heavy-duty tractors and 53-foot or longer box-type trailers, motor carriers, California-based brokers, and California-based shippers. Drivers, motor carriers, tractor owners, and trailer owners would be directly

responsible for ensuring that noncompliant tractors and trailers do not operate on California's highways. Although California-based shippers and brokers would not initially be held responsible for noncompliant tractors and trailers, they could be held responsible, under certain circumstances, if a motor carrier, tractor owner, or trailer owner with whom they did business failed to settle a previously issued notice of violation. Under this strategy, staff expects that motor carriers, tractor owners, and trailer owners, including those domiciled out of state, would have an incentive to settle outstanding violations in order to avoid any potential detriment to their relationships with California-based shippers and brokers. Ensuring that out-of-state fleets are treated the same as California-registered fleets with respect to enforcement, would provide an equitable playing field for doing business in California. See Appendix G, Implementation and Enforcement for further information.

Owners of long-haul vehicles affected by the proposed regulation may have up-front costs associated with acquisition of aerodynamic technologies and low-rolling resistance tires. These initial costs are expected to be recouped through savings from reduced fuel use, and the proposed regulation is expected to result in a substantial net savings for the businesses that operate long-haul vehicles in California. See Chapter XII, Cost and Economic Impacts, for a more detailed discussion.

The proposed regulation would provide an incentive for owners of trailers to retrofit their trailers early. For every 2010 and earlier model year 53-foot or longer box-type trailer that is compliant with the proposed regulation by December 31, 2009, the owner could delay the retrofit of 1.5 nonconforming trailers until 2016. This provision encourages early compliance and is structured such that GHG emissions would not be lost. The early compliance option is discussed in more detail in Appendix F, Optional Trailer Fleet Compliance Schedules.

3. Ensure that activities undertaken to comply with the regulations do not disproportionately impact low-income communities.

Long-haul heavy-duty vehicles operate throughout California; no disproportionate localized impacts are expected. Greater GHG and NOx reductions would occur in populations located near interstate highways, typically where low-income communities are located.

4. Ensure that entities that have voluntarily reduced their greenhouse gas emissions prior to the implementation of this section receive appropriate credit for early voluntary reductions.

The U.S. EPA SmartWay Partnership program is a voluntary program that encourages the use of approved aerodynamic technologies and low-rolling resistance tires. In response to this program, some long-haul vehicle owners have voluntarily installed aerodynamic technologies and low-rolling resistance tires that meet the requirements of the proposed regulation. The proposed regulation would allow extra flexibility to fleets that have complied early with the requirements by providing additional time to meet the requirements. See Appendix F, Optional Trailer Fleet Compliance Schedules.

5. *Ensure that activities undertaken pursuant to the regulations complement, and do not interfere with, efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions.*

The proposed regulation requiring the use of aerodynamic technologies and low-rolling resistance tires on long-haul heavy-duty vehicles would aid in efforts to achieve federal and state standards by reducing NOx emissions. Long-haul heavy-duty vehicles equipped with aerodynamic devices and low-rolling resistance tires are able to transport freight more efficiently, reducing the required load on the engine. Engines operating at lower loads have lower peak combustion temperatures and thus lower NOx emission rates. The magnitude of the reduction in NOx emissions resulting from improvement in tractor-trailer efficiency is dependent on the NOx emission rate of the tractor's engine. Older engines produce more NOx emissions, and thus will realize a greater NOx reduction benefit from efficiency improvements. See Chapter XI, Environmental Impacts, for a more detailed description.

6. *Consider cost-effectiveness of these regulations.*

The proposed regulation is expected to result in a substantial net savings for the businesses that operate long-haul heavy-duty vehicles in California. See Chapter XII, Cost and Economic Impacts, for a more detailed discussion.

7. *Consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health.*

The proposed requirements for long-haul heavy-duty vehicles are not expected to cause any adverse impacts to society or the environment. California would benefit from the reduction of GHG emissions. As discussed in the response to criterion five above, the proposal would not cause an increase in volatile organic compound or toxic air contaminant emissions, and would result in NOx emission reductions. See Chapter XI, Environmental Impacts, for a more detailed description.

8. *Minimize the administrative burden of implementing and complying with these regulations.*

For those long-haul heavy-duty vehicle owners that comply with the requirements by the established compliance dates, the administrative burden would be minimal. The proposed regulation requires no recordkeeping or reporting for these parties.

Only those tractor or trailer owners that wish to be classified as short-haul, and exempted from the requirements of the proposed regulation, or those that choose to participate in an optional compliance schedule or the refrigerated fleet compliance provision, would be subject to reporting requirements.

To apply for the short-haul exemption, owners would need to submit an application with specific information on the vehicle, vehicle owner, and vehicle's local haul base. Once approved, the tractor or trailer would be considered short-haul and not subject to the

requirements of the proposed regulation. The short-haul exemption would be effective for one year and would require renewal on an annual basis.

To participate in an optional compliance plan, owners would need to submit a compliance plan that would include a statement of intent, information on each affected trailer, and details as to which affected trailers would be retrofitted each year to comply with the optional phase-in schedule requirements.

To participate in the refrigerated fleet compliance provision, owners would need to submit information on each affected refrigerated-van trailer, and details as to which affected trailers would be retrofitted each year to comply with the phase-in schedule requirements.

There would be no recordkeeping requirements for motor carriers, California-based shippers, or California-based brokers.

9. Minimize leakage.

Leakage is not expected as a result of the proposed regulation. Leakage occurs when an emission limit or regulatory requirement set by the State causes business activities to be displaced outside of California. If leakage were to occur, emissions, jobs and other economic benefits to California would be lost. The proposed regulation requires that long-haul vehicles traveling on California highways be equipped with aerodynamic devices and low-rolling resistance tires, regardless of state or country of registration. Therefore, there would not be a situation where a long-haul heavy-duty vehicle registered inside the State would be at a competitive disadvantage compared to vehicles registered outside of the State. Similarly, both California and out-of-state motor carriers would be subject to the same requirements; both would be required to dispatch compliant vehicles.

The proposed regulation does, however, establish additional requirements for California-based brokers and California-based shippers. These California-based businesses would be required to use compliant long-haul vehicles when dispatching vehicles and loading freight for transport, respectively. The primary intent of this strategy is to provide an incentive for out-of-state motor carriers, tractor owners, and trailer owners to comply with the proposed regulation. Historically, it has been very time consuming and costly to collect penalties from unresponsive out-of-state fleets. This is because the State has no authority to hold the registrations of out-of-state registered vehicles and limited authority to hold the vehicles themselves. Therefore, if an out-of-state registered fleet currently refuses to settle a violation, it is necessary, in many cases, for the State of California to file a lawsuit against that fleet in their state of residence to collect any penalties. However, under the strategy of the proposed regulation, staff expects that most motor carriers, tractor owners, and trailer owners, including those domiciled out-of-state, would choose to settle their violations in order to avoid any potential detriment to their relationships with California-based shippers and brokers. Ensuring that out-of-state fleets are treated the same as California-registered fleets with respect to enforcement, would provide an equitable playing field for those doing business in California.

10. Consider the significance of the contribution of each source or category of sources to statewide emissions of greenhouse gases.

The transportation sector, which includes on-road vehicles, aviation, rail, and ships, is the largest contributor to the total statewide GHG emissions inventory, producing approximately 38 percent of the state's total GHGs, or 179 MMT CO₂e. This is projected to increase to 225 MMT CO₂e by 2020 if no actions are taken to reduce emissions. Thus, emissions from the transportation sector must be significantly reduced in order to achieve the AB 32 requirement that State GHG emission levels be reduced to 1990 levels by the year 2020. See Appendix C, Emission Inventory Analysis and Results for more details.

The statewide GHG emission benefits of the proposed regulation are projected to be 1.0 MMT CO₂e emissions in 2020. From 2010 to 2020, the cumulative GHG emission benefits are estimated to be approximately 7.8 MMT CO₂e statewide. While this reduction may appear somewhat modest, when the reduction is considered in conjunction with anticipated future GHG reductions from current and future reductions from other categories, the total reductions are significant. Key to ARB's overall strategy to meet AS 32's aggressive GHG emission reduction goals is to achieve relatively small reductions from a large number of categories, and thus achieve a significant overall reduction in GHG emissions by 2020.

11. The greenhouse gas emission reductions achieved are real, permanent, quantifiable, verifiable, and enforceable by the state board.

The proposed regulation would require compliant tractors and trailers to be either: 1) retrofitted with aerodynamic technologies and low-rolling resistance tires that are U.S. EPA SmartWay approved technologies, or 2) a U.S. EPA certified SmartWay tractor or trailer. The technical requirements and specifications that compliant tractors and trailers would be required to meet are defined by the U.S. EPA SmartWay Partnership Program. The proposed regulation defines the dates when specified requirements would become effective and provides ARB, CHP, and District personnel the authority to inspect heavy-duty vehicles and audit records for enforcement. The proposed regulation defines recordkeeping and reporting requirements that would provide enforcement personnel with information necessary to enforce the requirements of the proposed regulation in the field. Once the proposed regulation is approved by the Office of Administrative Law, the proposed emission limit would become State law. Based on the above, upon the effective date of the proposed emission limit, the reductions would become real, permanent, quantifiable, verifiable, and enforceable.

12. For regulations...the reduction is in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.

The proposed regulation is the first GHG emission limitation affecting the long-haul heavy-duty vehicle industry. No other existing State, federal or other requirements

would affect emissions of GHGs from long-haul heavy-duty vehicles. The proposed regulation requirements are based on the requirements of the U.S. EPA's SmartWay Partnership program, which is a voluntary program. Although the SmartWay program has been in place since 2004, a relatively small number of tractors and trailers **have** been retrofitted with aerodynamic technologies in response to this program. This is especially true for trailers, where staff estimates that less than 0.3 percent of the total 53-foot or longer box-type trailer inventory incorporates aerodynamic technologies.

13. If applicable, the greenhouse gas emission reduction occurs over the same time period and is equivalent in amount to any direct emission reduction required pursuant to this division.

This requirement is not applicable to the proposed regulation.

14. The state board shall rely upon the best available economic and scientific information and its assessment of existing and projected technological capabilities when adopting the regulations required by the law.

ARB staff used the best available economic and scientific **information** available to develop the proposed regulation. The description in this section documents that the proposal was developed in accordance with AB 32 requirements. Chapter XII, Cost and Economic Impacts, contains a detailed description of the economic impact of the proposed regulation. In addition, a technological assessment of the feasibility of the required aerodynamic technologies and low-rolling resistance tire technologies required by the proposed regulation is presented in Chapter IX, Technological Feasibility of Control Measure.

XIV. ISSUES

A. Mexican Border Issues

During the regulatory development process, staff heard comments from a U.S. motor carrier regarding concerns associated with complying with the trailer aerodynamic technology requirements while routinely driving across the U.S.-Mexico border. According to the U.S. motor carrier, the maintenance costs associated with repairing or replacing side skirt technology installed on trailers that traveled throughout Mexico outweighed the cost savings associated with improved fuel economy. Reportedly, a number of the skirts became damaged when traveling on Mexican roads that were in a state of disrepair. Also, many of the installed skirts were stolen from trailers that were parked overnight in unsecured parking facilities and alongside roadways.

Mexican motor carriers also had concerns about complying with the rule. At a public workshop, a Mexican-based motor carrier stated that a number of the tractor-trailers that cross the U.S. border on a daily basis travel 20 miles or less to distribution centers in California. They "drop and hook" trailers at these facilities and return back to Mexico. "Drop and hook" refers to the activity of dropping-off a trailer at a warehouse or distribution center and hooking up to pull a different trailer to another location. Typically,

tractors engaged in drop and hook activities make several trips into the U.S. every week. The Mexican-based motor carrier, like the U.S. motor carrier, was concerned that the required aerodynamic technologies would be frequently damaged when traveling throughout Mexico. Also, there were concerns raised about the capital costs associated with these technologies and whether the smaller owner-operators that currently own one or two older tractors and trailers would be able to absorb these costs and continue doing business.

In response to the above issues, staff believes the provisions in the proposed regulation for exempting short-haul tractors and trailers can be used by many motor carriers that traverse the U.S-Mexico border. As discussed in Chapter VIII, Proposed Regulation, owners of tractors and trailers may register them as short-haul tractors and trailers as long as they only operate within 100 miles of their local base. Tractors have the option of limiting their annual vehicle miles traveled to 50,000 miles per year, rather than limiting their area of operation. Tractors and trailers that meet the short-haul criteria and that are registered with the ARB as short-haul tractors and trailers would be exempted from the proposed requirements. This would address issues associated with equipment damage and capital costs, but it would require the owners of these tractors and trailers to register them with the ARB. Motor carriers that wish to use this option may be required to alter their current method of operation, since the area of operation of these tractors and trailers would be limited.

B. Other Rulemakings

Staff evaluated the impact of having to concurrently comply with the proposed rule and two other rulemakings, the proposed Truck and Bus Rule and the previously-adopted TRU Rule. The details of this evaluation are presented below.

1. *Impact with Truck and Bus Rule*

Staff's proposal will be considered for adoption together with the Truck and Bus Rule, which would also have a regulatory impact on businesses operating heavy-duty vehicles. From 2010 through 2020, the Truck and Bus Rule would require the retrofit, repower, or replacement of vehicles equipped with model-year 2006 and older heavy-duty diesel-fueled engines. These requirements would phase in concurrently with requirements of staff's proposal.

Although certain fleets could end up having to bear the burden of concurrently complying with both staff's proposal and the Truck and Bus Rule, staff believes that the number of these fleets would likely be small. This is because staff's proposal would only apply to long-haul vehicles, which, according to vehicle population data, are typically newer. Therefore, staff does not expect long-haul fleets to have many vehicles within the scope of the Truck and Bus Rule's requirements during the period of regulatory overlap.

Nevertheless, staff realizes that certain businesses could still be significantly impacted by both regulations, and therefore, has included the impact analysis below.

a) *New Tractor Requirements*

Staff's proposal would require all 2011 and subsequent model year tractors with sleeper berths to be SmartWay certified. Staff does not believe this requirement would significantly impact businesses, including ones affected by the Truck and Bus Rule, because the incremental cost of a SmartWay certified tractor is relatively small. For example, staff estimates that a new SmartWay certified tractor is \$2,100 more than a typical sleeper berth tractor. Assuming that the average price of a sleeper berth tractor is \$121,000,¹⁸ the incremental cost would be less than 2 percent of the total price of the vehicle. In addition, the regulation does not force the turnover of existing vehicles.

b) *In-Use Tractor Requirements*

Staff's proposal would require all 2010 and previous model year tractors to use SmartWay approved low-rolling resistance tires. Staff believes this requirement would place very little burden on businesses, primarily because the price difference between a SmartWay approved tire and a standard tire is little to none. Based on staff's verbal communication with various fleets, the incremental cost of a SmartWay approved tire ranges from \$0 to \$50. In addition, tires are consumables that are replaced anyway, and the tire requirement would allow adequate time for vehicles to wear down their existing tires treads before requiring them to change. Moreover, although those affected would not be allowed to recap their noncompliant casings, they could still sell these casings in the secondary market to short-haul fleets, fleets that do not service California, and rubber recyclers. Therefore, staff does not believe that this requirement would add to the impact of the proposed regulation.

c) *New Trailer Requirements*

Staff's proposal would require all 2011 and subsequent model year box-type trailers to be SmartWay certified or equipped with a required number of SmartWay approved devices. Because natural turnover rates of trailers are low, staff does not believe that this requirement by itself would have a significant impact on businesses. However, staff expects that many fleets would choose to purchase new SmartWay certified trailers instead of retrofitting older trailers with SmartWay approved devices to comply with the proposal's in-use trailer requirements. Therefore, the primary impact of this requirement will be considered as part of the impact of the in-use trailer requirements, discussed below.

d) *In-Use Trailer Requirements*

The proposed regulation would require all in-use box-type trailers that operate in California to be SmartWay certified or equipped with a required number of SmartWay approved devices by December 31, 2012. Staff expects the largest impact of this proposal to come from these requirements due to the large number of trailers that operate in California.

¹⁸ "Truck Paper," October 7, 2008, <<http://www.truckpaper.com>>

Therefore, to alleviate some of the burden that a business could potentially face when trying to comply with both the current proposal and the Truck and Bus Rule, staff's regulatory proposal includes the option for a trailer fleet to participate in a compliance schedule that would allow the fleet to delay full compliance of in-use trailers beyond the December 31, 2012 compliance deadline. Two compliance schedules were developed for this purpose--one for large fleets of trailers (21 or more trailers) and one for small fleets of trailers (20 or less trailers). In addition, certain refrigerated trailers concurrently affected by the TRU Rule and staff's proposal could receive an additional delay as described in section 2 below.

Under the large fleet compliance schedule, trailer fleets would be required to begin bringing trailers into compliance in 2010, but would be given until the end of 2015 to complete their fleet transition. Additional flexibility would be available to fleets that bring trailers into compliance before December 31, 2009. Fleets that do so would be given one additional year to bring their remaining trailers into compliance. Furthermore, the large fleet compliance schedule also begins with a conservative phase-in, which would only require 15 percent of a fleet's trailers to comply by the end of the second compliance year (December 31, 2011). This would provide even more flexibility by giving fleets the opportunity to get ahead of early percentage requirements in order to reduce obligations in later years. Staff believes that the built-in flexibility would allow fleets to better manage their capital expenditures for complying with the current proposal and the Truck and Bus Rule. Moreover, because long-haul fleets typically operate newer vehicles, it would be even less likely for a long-haul fleet to be significantly impacted by the Truck and Bus Rule after December 31, 2011. Based on the reasons above, staff believes this compliance schedule would provide adequate time for large fleets to comply with the requirements of the current proposal, even if they are also concurrently subject to the Truck and Bus Rule.

To further reduce regulatory impacts on smaller fleets, they would not be required to begin bringing trailers into compliance until 2013, and would be given until the end of 2016 to complete their fleet transition.

2. *Impact with TRU Rule*

The TRU Rule requires the retrofit, repower, or replacement of trailers equipped with 2009 and older model year diesel-fueled TRUs from 2010 through 2016. These requirements would phase in concurrently with the large fleet and small fleet compliance schedules of staff's proposal. In addition, since both the TRU Rule and staff's proposal would affect trailers, trailer owners could face a significant burden should they be subjected to both regulations. Therefore, staff developed a special provision that would delay this proposed regulation's phase-in requirements for most 2003 through 2008 model year refrigerated trailers until after 2016. As currently proposed, the refrigerated fleet provision would provide three years (2017-2019) to phase in affected refrigerated trailers. Staff feels that this would allow fleets to better distribute the regulatory impact of complying with the two regulations.

XV. RECOMMENDATION

Staff recommends the Board adopt new sections 95300 through 95312 entitled "Heavy-Duty Vehicle Greenhouse Gas Emission Reduction Measure" in its entirety in chapter 16 of the California Code of Regulations, title 17. The regulatory language is set forth in the proposed regulation order in Appendix A.

XVI. REFERENCES

- ARB, 2001. California Air Resources Board. *Policies and Actions for Environmental Justice*. Sacramento: December 13, 2001.
<http://www.arb.ca.gov/ch/programs/ej/ej.htm>
- ARB, 2002. California Air Resources Board. *California Air Resources Board Strategic Plan*. Sacramento: January 2002.
<http://www.arb.ca.gov/planning/plan01/plan01.htm>
- ARB, 2004. California Air Resources Board. *Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider Adoption of Regulations to Control Greenhouse Gas Emissions from Motor Vehicles*. Sacramento: August 6, 2004. <http://www.arb.ca.gov/regactlgrnhsgas/grnhsgas.htm>
- ARB, 2007. California Air Resources Board. *"Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration."* Sacramento: October 2007.
<http://www.arb.ca.gov/cc/cea/reports/reports.htm>
- ARB, 2008a. California Air Resources Board. *Staff Report: Initial Statement Of Reasons For Proposed Rulemaking. Proposed Regulation For In-Use On-Road Diesel Vehicles. Appendix G - Emissions Inventory Methodology and Results*. Sacramento: To be released October 2008.
- ARB, 2008b. California Air Resources Board. *Greenhouse Gas Inventory Data - Draft 2020 Forecast*. Last Reviewed July 29, 2008. Last Accessed September 20, 2008.
<http://www.arb.ca.gov/cc/inventory/data/forecast.htm>
- ARB, 2008c. California Air Resources Board. *Climate Change Proposed Scoping Plan. Appendices Volume 1/: Analysis and Documentation*. (Appendix I, p.I-6). Sacramento: October 2008.
<http://www.arb.ca.gov/cc/scopingplan/documentlscopingplandocument.htm>
- Bachman, 2005. Bachman, Leon J., Anthony Erb, Cheryl Bynum. *Effect of Single Wide , Tires and Trailer Aerodynamics on Fuel Economy and NOx Emissions of Glass 8 Line-Haul Tractor-Trailers*. Society of Automotive Engineer 2005-01-3551
<http://www.epa.gov/smartwavJtransportdocuments/tech/effects-on-fuel-economy.pdf>
- Bachman, 2006. Bachman, L J., A. Erb, C. Bynum, B. Shoffner, H. De La Fuente, C. Ensfield. *Fuel Economy Improvements and NOx Reduction by Reduction of Parasitic Losses: Effect of Engine Design*. Society of Automotive Engineer, 2006-01-3474. <http://www.epa.gov/smartwayltransportldocuments/tech/fuel-economy-improvements.pdf>

- Bajer, 2008. Bajer, Jacques. *Tire Rolling Resistance*. Modern Tire Dealer. Uniontown, OH: August 2008.
http://www.moderntiredealer.com/t_inside.cfm?action=art_det&storyID=1524
- CEC 2007. California Energy Commission. *Transportation Energy Forecasts for the 2007 Integrated Energy Policy Report*. CEC-600-2007-009-SF. September 2007
<http://www.energy.ca.gov/2007publications/CEC-600-2007-009/CEC-600-2007-009-SF.PDF>
- Census, 2000. United States Bureau of Census. *Current Industrial Reports, M336L - Truck Trailers*. <http://www.census.gov/cir/www/336/m3361.html>
- Census, 2002. United States Bureau of Census. *2002 Vehicle Inventory and Use Survey Microdata*. <http://www.census.gov/svsd/www/vius/products.html>
- EIA, 2008. Energy Information Administration. *Diesel Historical Data (.xls)*
<http://tonto.eia.doe.gov/oog/info/wohdp/diesel.asp>
- Freight Wing, 2007. Freight Wing, Inc. *Technology, Test Results and Benefits Summary. 2007*.
- Freight Wing, 2008. Freight Wing, Inc. *Maintenance Summary and Cost Analysis: 10/11/05 thru 4/24/08*. Seattle: 2008.
- IPCC,2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
<http://www.ipcc.ch/ipccreports/ar4-wg1.htm>
- Laydon,2007. Laydon Composites, Ltd. *Trailer Skirt*. Presentation: Cascade Sierra Solutions. 2007. https://secure.cascadesierrasolutions.org/CSS_library/ (Last accessed October 20,2008).
- Linsley, 1977. Linsley, Ray K. *Water Resources Engineering*. Third Edition. 1977. Harper & Row.
- Michelin,2002. LaClair, Tim J. *Tire Rolling Resistance, Its Impact on Fuel Economy, and Measurement Standards*. Sacramento: September 19, 2002.
http://www.energy.ca.gov/transportation/tire_efficiency/former_proceeding/2002-09-19_workshop/TIM_LACLAIR_MICHELIN.PPT
- MTD 2006. Modern Tire Dealer. *Commercial*. Uniontown, OH: January 2006.
http://www.moderntiredealer.com/t_pop_pdf.cfm?link=research/commercial1.pdf

- MTD 2008. Modern Tire Dealer. *Truck tire market share*. Uniontown, OH: June 2008.
http://www.moderntiredealer.com/t_pop_pdf.cfm?link=research/JUN_31.pdf
- Nunez,2002. *Assembly Bill No. 32*. September 27,2006.
http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf
- Ogburn,2007. Ogburn, Michael J., Laurie A. Ramrot. *Truck Efficiency and GHG Reduction Opportunities in the Canadian Truck Fleet*. 2007.
- OOIDA, 2004. OOIDA Foundation Inc. *The 2004 Owner-Operator Member Profile Survey*. 2004.
- SAE J1269. SAE J1269 Rolling Resistance Measurement Procedure for Passenger Car, Light Truck, and Highway Truck and Bus Tires. Sep 1, 2006
- SAE J1321. Joint Tmc/SAE Fuel Consumption Test Procedure-Type II. October 1986
- Schubert, 2008. Schubert, R., Matt Kromer. *Heavy-Duty Truck Retrofit Technology: Assessment and Regulatory Approach Final Report*. Report to: Union of Concerned Scientists. September 12, 2008
- Surcel, 2007. Surcel, Marius-Dorin. *Energostet:2007, Fuel Consumption Test for Evaluating Freight Wing Trailer Side Skirts*. Internal Report IR-2007-11-28D. Pointe-Claire: November 2007.
- Surcel, 2007. Surcel, Marius-Dorin. *Energostet:2001, Fuel Consumption Test for Evaluating Advanced Transit Dynamics TrailerTails™*. Internal Report IR-2007-11-28A. Pointe-Claire: November 2007.
- TRIB, 2008. Tire Retread & Repair Information Bureau. *Retread facts*. Pacific Grove, CA: 2008. <http://www.retread.org/Facts/index.cfm/ID/225.htm>
- U.S. EPA, 2007. U.S. Environmental Protection Agency. *SmartWay SIP and Transportation Conformity Guidance: Accounting for NOx Reductions from Trailer Aerodynamic Kits and Low Rolling Resistance Tires*. EPA420-B-07-004. June 2007. www.epa.gov/otag/stateresources/transconf/policY/420b07004.pdf
- U.S. EPA, 2008. Bynum, Cheryl L. Email Communication with Ms. Cheryl L. Bynum (U.S. EPA SmartWay Program). March 25, 2008.
- Vieth, 2008. Vieth, Ken. Telephone Communication with Mr. Ken Vieth, Senior Partner and General Manager of Americas Commercial Transportation Research co., LLC (ACT Research). July 2,2008

Vise,2007. Vise, Avery. The CCJ Top 250: Mediocre at Best. *Commercial Carrier Journal*. August 2007. pp. 61-110.
http://www.rrpub.com/etrucker/ccj/ccj0807_250.pdf

Vise,2008. Vise, Avery. *The CCJ Top 250: Slower But Solid*. *Commercial Carrier Journal*. August 2008. pp. 52-103. http://www.rrpub.com/ccj/pdfs/top250_07.pdf

Appendix A:
Proposed Regulation Order

APPENDIX A

PROPOSED REGULATION ORDER

Adopt new Subarticle 1, sections 95300 to 95312, title 17, California Code of Regulations, to read as follows:

Subarticle 1: Heavy Duty Vehicle Greenhouse Gas Emission Reduction Measure*95300 Purpose.*

The purpose of this subarticle is to reduce greenhouse gas emissions from heavy-duty (HD) tractors and 53-foot or longer box-type semitrailers (trailers) that transport freight on California highways.

NOTE: Authority cited: Sections 39600, 39601, 38510, 38560, and 38560.5, Health and Safety Code. Reference: Sections 39600, 38560, 38560.5, and 38580, Health and Safety Code.

95301. Applicability.

- (a) This subarticle applies to owners and *drivers* of the following equipment when driven on California highways, as well as motor carriers, California-based brokers, and California-based shippers that use the following equipment on California highways:
 - (1) **HD** tractors that pull 53-foot or longer box-type trailers; and
 - (2) 53-foot or longer box-type trailers that are pulled by **HD** tractors.
- (b) The requirements in this subarticle do not apply to the following vehicles:
 - (1) drop-frame trailers;
 - (2) chassis trailers;

- (3) curtain-side trailers;
 - (4) box-type trailers less than 53 feet in length;
 - (5) HD tractors or box-type trailers that have been granted an exemption under the provisions of section 95305, *Exemptions*:
 - (6) authorized emergency vehicles; and
 - (7) military tactical support vehicles.
- (c) Disclosure of Regulation Applicability: Any person residing in California selling a HD tractor or 53-foot or longer box-type trailer subject to this regulation must provide the following disclosure in writing to the buyer on the bill of sale, "A heavy-duty tractor and 53-foot or longer box-type trailer operated in California may be subject to the California Air Resources Board Heavy Duty Vehicle Greenhouse Gas Emission Reduction Measure. It therefore could be required to use low-rolling resistance tires and meet aerodynamic equipment requirements to reduce greenhouse gas emissions. For more information, please visit the California Air Resources Board website at <http://www.arb.ca.gov/cc/hdghg/hdghg.htm>....

NOTE: Authority cited: Sections 39600,39601,38510,38560, and 38560.5, Health and Safety Code. Reference: Sections 39600,38560,38560.5, and 38580, Health and Safety Code.

95302. *Definitions.*

- (a) The following definitions apply to this subarticle:
- (1) "*Aerodynamic technologies*" means components designed to reduce wind resistance on the tractor or trailer resulting in improved overall tractor fuel economy and reduced carbon dioxide emissions. There are two types of aerodynamic technologies: fairings and flow control devices.
 - (2) "*Authorized emergency vehicle*" means a vehicle as defined in Vehicle Code section 165.
 - (3) "*Box-type trailer*" means a dry-van trailer or refrigerated-van trailer that is not a drop-frame trailer.
 - (4) "*Broker*" means a person who functions as an intermediary between two or more shippers and receivers, dispatching vehicles for the pick-up and delivery of freight, but is not a motor carrier or tractor owner or trailer owner.

- (5) "*Cab side extender*" means a flow control device placed vertically on the rear side of the tractor that fans out slightly and reduces the space between the tractor and trailer.
- (6) "*Chassis trailer*" means a trailer composed of a simple chassis for the mounting of a containerized load.
- (7) "*Container*" means a simple, enclosed box of standardized sizes, used for intermodal transport.
- (8) "*Curtain-side trailer*" means a flatbed trailer with tarp sides that can be loaded from the sides, top, or rear.
- (9) "*Dispatch*" means to contact vehicle owners, coordinate delivery, pickup, and drop-off schedules of such vehicles; and monitor the delivery of freight from such vehicles.
- (10) "*Dispatch driver*" means the driver of a HD tractor that has been dispatched by a motor carrier or broker.
- (11) "*Drayage tractor*" means any in-use on-road tractor with a Gross Vehicle Weight Rating of 33,000 pounds or greater operating on or transgressing through port or intermodal rail yard property for the purpose of loading, unloading or transporting cargo, such as containerized, bulk or break-bulk goods.
- (12) "*Driver*" means a person who physically operates a HD tractor.
- (13) "*Drop-frame trailer*" means an enclosed rectangular trailer with a lowered deck starting just behind the bed plate to create more cargo space.
- (14) "*Dry-van trailer*" means an enclosed non-climate controlled trailer.
- (15) "*Fairing*" means a structure with smoothly contoured solid surfaces that reduces the wind resistance of the objects they cover.
- (16) "*Flatbed Trailer*" means a trailer consisting of a completely open platform with no sides or railings.
- (17) "*Flow control device*" means an **object** or design element that manipulates the air flow around an object by changing the air flow characteristics in order to reduce the pressure force exerted on the vehicle.
- (18) "*Front trailer fairing*" means a curved fairing that attaches to the front facing surface of a trailer that covers all or part of the trailer's front facing surface.

- (19) *"Fuel tank fairing"* also known as a chassis skirt, means a fairing located at the base of the cab between the front wheel of the tractor and the forward-most rear wheel, covering the open space and streamlining the fuel tank.
- (20) *"Good operating condition"* means the condition of a HD tractor or box-type trailer that meets the applicable standards in section 95304 for continued aerodynamic efficiency.
- (21) *"Gross vehicle weight rating"* or *"GVWR"* means the GVWR as defined in Vehicle Code Section 350.
- (22) *"Heavy-duty tractor"* or *"HD tractor"* means a class 7 or class 8 motor vehicle designed to pull a semitrailer on a highway by means of a fifth wheel mounted over the rear axle(s).
- (23) *"Highway"* means a "highway" as defined in Vehicle Code section 360.
- (24) *"Integrated sleeper cab roof fairing"* means a fairing located on the roof of a sleeper-cab-equipped tractor that extends from the front windshield of the tractor cab to the rear edge of the sleeper cab, with enclosed sides that line up with the sides of the sleeper cab.
- (25) *"Lessee"* means a "lessee" as defined in section 371 of the Vehicle Code.
- (26) *"Local haul base"* means the location where a short-haul tractor is garaged and maintained, and the location from where a short-haul trailer is routinely dispatched:
- (27) *"Low-rolling-resistance tire"* means a tire that is designed to improve fuel efficiency of a tractor pulling a trailer by minimizing its rolling resistance, which consists of the energy lost as heat within the rubber itself, as well as aerodynamic drag of the tire, and friction between the tire and the road and between the tire and the rim when the tire is rolling under load; rolling resistance is expressed as the energy consumed per unit distance as the tire rolls under load.
- (28) *"Military tactical support vehicle"* means a "Military Tactical Support Vehicle" as defined in title 13, CCR, section 1905.
- (29) *"Motor carrier"* means a person that contracts to pick up and deliver commercial freight, and hires tractor owners or employs drivers, who are dispatched to pick up and deliver commercial freight.
- (30) *"Owner"* means any person except a bank or other financial lending institution that legally holds title (or its equivalent) to a HD tractor or trailer

showing ownership of the tractor or trailer. For purposes of this subarticle, a lessee or lessor of a tractor or trailer is considered the owner of the tractor or trailer in accordance with the following criteria:

- (A) The lessee of a tractor or trailer is considered the owner if the following conditions are met:
 - 1. the lessee has leased the tractor or trailer for a period of at least one year prior to the effective date of this subarticle, or
 - 2. the lessee has leased the vehicle for a period of one year or more after the effective date of this subarticle, and the written lease agreement or amendment to the agreement specifically identifies the lessee as the owner.

- (8) The lessor of a tractor or trailer is considered the owner if the following conditions are met:
 - 1. neither of the conditions listed in subsection (a)(30)(A) are met, or
 - 2. a written agreement between the lessee and lessor prohibits the lessee from modifying the leased or rented vehicle to comply with this subarticle.

- (31) "*Persod*" means an individual, corporation, business trust, estate, trust, partnership, limited liability company, association, joint venture, government, governmental subdivision, agency, or instrumentality, public corporation, or any other legal or commercial entity.

- (32) "*Rear trailer fairing*" means a fairing that attaches to the perimeter outer edges of the trailer's rear-facing surface to provide a continuous surface for the air passing over the side and top surfaces of the trailer.

- (33) "*Refrigerated-van trailer*" means a trailer van that has a refrigeration or heating unit built **into** the trailer to maintain precise temperatures and is used to haul frozen food, fresh produce, hot or warm food, and other perishable items.

- (34) "*Receiver*" means a commercial operation to which freight will be or has been delivered that is intended for commercial, not private use. This may include, but is not limited to, owners of freight distribution centers, and temporary freight storage facilities.

- (35) "*Semitrailer*" means a "Semitrailer" as defined in section 550 of the Vehicle Code.

- (36) *"Shipper"* means a person that has possession of freight prior to its transportation. This may include, but is not limited to, owners of freight distribution centers, and temporary freight storage facilities.
- (37) *"Sleeper cab"* means a HD tractor body that has a compartment located behind the driving compartment that contains a bed.
- (38) *"Short-haul tractor"* means a HD tractor that either travels less than 50,000 miles in a calendar year, or travels exclusively within a 100 mile radius of its local haul base.
- (39) *"Short-haul trailer"* means a 53-foot or longer box-type trailer that travels exclusively within a 100 mile radius of its local haul base.
- (40) *"Tractor"* means a "Truck Tractor" as defined in section 655 of the Vehicle Code.
- (41) *"Trailer side skirt"* means a fairing that extends down from the bottom of the trailer to cover part of the open space between the tractor and the rear wheels.
- (42) *"Transport refrigeration unit" or "TRU"* means a refrigeration system powered by an integral internal combustion engine designed to control the environment of temperature sensitive products that are transported in trucks and refrigerated trailers. TRUs may be capable of both cooling and heating.
- (43) *"U.S. EPA Approved SmartWay Technology" or "U.S. EPA Approved SmartWay Technologies"* means one or more aerodynamic technologies or low-rolling resistance tire models that has been identified by the U.S. EPA as meeting the technical specifications and requirements of the U.S. EPA SmartWay Transport Partnership Program.
- (44) *"U.S. EPA Certified SmartWay Tractor"* means a tractor that has been certified by the U.S. EPA to meet the technical specifications and requirements of the U.S. EPA SmartWay Transport Partnership Program.
- (45) *"U.S. EPA Certified SmartWay Trailer"* means a 53-foot or longer box-type trailer that has been certified by the U.S. EPA to meet the technical specifications and requirements of the U.S. EPA SmartWay Transport Partnership Program.
- (46) *"U.S. EPA SmartWay Partnership Program"* means the U.S. EPA's voluntary program that is a collaboration between the U.S. EPA and the transportation industry to improve energy efficiency, reduce greenhouse gas and air pollutant emissions, and improve energy security. This program establishes requirements for improving freight movement efficiency and for

improving the fuel efficiency of freight moving equipment. Information on the U.S. EPA SmartWay Partnership Program is available through the U.S. EPA Office of Transportation and Air Quality (OTAQ), USEPA Headquarters, 1200 Pennsylvania Avenue, N.W, Washington, DC 20460; and at the U.S. EPA SmartWay website at <http://www.epa.gov/smartwayl>.

NOTE: Authority cited: Sections 39600,39601,38510,38560, and 38560.5, Health and Safety Code. Reference: Sections 39600,38560,38560.5, and 38580, Health and Safety Code.

95303 Requirements and Compliance Deadlines.

(a) Tractor Requirements

- (1) Beginning January 1, 2010, no 2011 or subsequent model year sleeper-cab HD tractor pulling a 53-foot or longer box-type trailer shall operate on a highway within California unless such *tractor* is a U.S. EPA Certified SmartWay Tractor.
- (2) Beginning January 1, 2010, no 2011 or subsequent model year HD tractor, including but not limited to sleeper-cab HD tractors, pulling a 53-foot or longer box-type trailer shall operate on a highway within California unless such tractor's tires are U.S. EPA Approved SmartWay Technologies.
- (3) Beginning January 1, 2012, no HD tractor, regardless of model year, pulling a 53-foot or longer box-type trailer shall operate on a highway within California unless such tractor's tires are U.S. EPA Approved SmartWay Technologies.

(b) Trailer Requirements

(1) 2011 and Subsequent Model Year Dry-Van Trailer Requirements

Beginning January 1, 2010, no 2011 or subsequent model-year 53-foot or longer dry-van trailer shall travel on a highway within California unless such trailer is either:

- (A) a U.S. EPA Certified SmartWay Trailer, or,
- (B) equipped with one of the following two combinations of tires and aerodynamic technologies, installed in accordance with manufacturer's instructions:
 1. tires that are U.S. EPA Approved SmartWay Technologies, and trailer side skirts that are U.S. EPA Approved SmartWay

Technologies, and either a front trailer fairing that is a U.S. **EPA** Approved SmartWay Technology or a rear trailer fairing that is a U.S. **EPA** Approved SmartWay Technology for dry-van trailers; or

2. tires that are U.S. **EPA** Approved SmartWay Technologies, and any combination of dry-van trailer aerodynamic technologies that has been demonstrated to the U.S. **EPA** to meet or exceed a 5 percent fuel savings in accordance with the requirements defined by the U.S. **EPA** SmartWay Partnership Program.

(2) 2011 and Subsequent Model Year Refrigerated-Van Trailer Requirements

Beginning January 1, 2010, no 2011 or subsequent model year 53-foot or longer refrigerated-van trailer shall travel on a highway within California unless such trailer is either:

- (A) a U.S. **EPA** Certified SmartWay Trailer, or,
- (B) equipped with one of the following two combinations of tires and aerodynamic technologies, installed in accordance with manufacturer's instructions:
 1. tires that are U.S. **EPA** Approved SmartWay Technologies, and trailer side skirts that are U.S. **EPA** Approved SmartWay Technologies for dry-van trailers, or
 2. tires that are U.S. **EPA** Approved SmartWay Technologies, and any combination of dry-van trailer aerodynamic technologies that has been demonstrated to the U.S. **EPA** to meet or exceed a 4 percent fuel savings in accordance with the requirements defined by the U.S. **EPA** SmartWay Partnership Program.

(3) 2010 or Previous Model Year Dry-Van and Refrigerated-Van Trailer Requirements

- (A) A 2010 or previous model year 53-foot or longer box-type trailer may not travel on a highway within California unless such trailer is either a dry-van trailer that meets the requirements of subsections (b)(1)(A) or (b)(1)(B) or a refrigerated-van trailer that meets the requirements of subsections (b)(2)(A) or (b)(2)(B). These requirements must be met by January 1, 2013, or:
 1. by the applicable compliance dates in section 95307, *Optional Trailer Fleet Compliance Schedule*, if such trailer is included in the fleet of trailers participating in the *Optional Trailer Fleet Compliance Schedule*; or

2. by the applicable compliance dates in section 95308, *Refrigerated Fleet Compliance Provision*, if such trailer is included in the fleet of refrigerated-van trailers participating in the *Refrigerated Fleet Compliance Provision*

(c) Requirements for Drivers

- (1) A driver cannot operate a HD tractor to pull a 53-foot or longer box-type trailer on a highway in California unless both the tractor and the trailer
 - (A) comply with the requirements and compliance deadlines defined in subsections (a) and (b), and
 - (8) are in good operating condition as defined in section 95304.
- (2) A driver must, upon demand, provide the following information if available to authorized enforcement personnel identified in section 95309:
 - (A) driver's license;
 - (8) vehicle odometer reading, if applicable;
 - (C) tractor registration;
 - (D) trailer registration;
 - (E) origin of freight being transported;
 - (F) destination of freight being transported;
 - (G) if dispatched by a motor carrier, the motor carrier information set forth in subsection (g)(1)(8);
 - (H) if dispatched by a broker, the broker information set forth in subsection (f)(1)(8);
- (3) A driver shall not operate a HD tractor to pull a 53-foot or longer box-type trailer on a highway in California if the trailer has aerodynamic technologies that are not deployed or not in their operational configuration.

(d) Requirements for Owners of HD Tractors

- (1) An owner of a HD tractor cannot use or authorize the use of a HD tractor to pull a 53-foot or longer box-type trailer on a highway in California unless both the HD tractor and the box-type trailer:

(A) comply with the requirements and compliance deadlines set forth in subsections (a) and (b); and

(B) are in good operating condition as defined in section 95304.

(e) Requirements for Owners of Box-Type Trailers

(1) An owner of a 53-foot or longer box-type trailer **must** ensure that the 53-foot or longer box-type trailer will not be pulled by a HD tractor on a highway in California unless the 53-foot or longer box-type trailer:

(A) complies with the requirements and compliance deadlines set forth in subsection (b);

(B) is in good operating condition as defined in section 95304.

(2) An owner of one or more 2010 or previous model year 53-foot or longer box-type trailers that are subject to the requirements of subsection (b)(3) may elect to follow an alternative compliance schedule, if applicable. Owners that follow an alternative compliance schedule must meet the requirements of section 95307, *Optional Trailer Fleet Compliance Schedules*.

(3) An owner of one or more 2010 or previous model year 53-foot or longer box-type trailers that are subject to the requirements of subsection (b)(3) may elect to follow the refrigerated-van trailer provision, if applicable. Owners that follow the refrigerated-van trailer compliance schedule must meet the requirements of section 95308, *Refrigerated Fleet Compliance Provision*.

(f) Requirements for California-based Brokers

(1) A California-based broker must:

(A) only dispatch HD tractors and 53-foot or longer box-type trailers that comply with the operating requirements and compliance deadlines set forth in subsections (a) and (b);

(B) provide the following information to the dispatch driver:

1. broker's business name
2. broker's street address, state, zip code
3. broker's contact person's name

4. broker contact person's business phone number

(g) Requirements for Motor Carriers

(1) A motor carrier must:

- (A) only dispatch HD tractors and 53-foot or longer box-type trailers that comply with the operating requirements and compliance deadlines set forth in subsections (a) and (b);
- (B) provide the following information to the dispatch driver:
 1. motor carrier's business name
 2. motor carrier's street address, state, zip code
 3. motor carrier contact person's name
 4. motor carrier contact person's business phone number

(h) Requirements for California-Based Shippers

- (A) A California-based shipper must not ship freight in a 53-foot or longer box-type trailer pulled by a HD tractor on a California highway unless the HD tractor and the 53-foot or longer box-type trailer comply with the operating requirements and compliance deadlines set forth in subsections (a) and (b).

NOTE: Authority cited: Sections 39600, 39601, 38510, 38560, and 38560.5, Health and Safety Code. Reference: Sections 39600, 38560, 38560.5, and 38580, Health and Safety Code.

95304 Good Operating Condition Requirements.

(a) Good Operating Condition Criteria for U.S. EPA Certified SmartWay Tractor Aerodynamic Technologies.

- (1) An aerodynamic mirror, a cab side extender, a fuel tank fairing, and an integrated sleeper cab roof fairing on a U.S. EPA Certified SmartWay Tractor must meet the following criteria:
 - (A) Each must be installed in accordance with manufacturer's specifications.

- (8) Each must be securely fastened to the tractor.
 - (C) Each must not be used if it is damaged to such an extent as to compromise its aerodynamic effectiveness.
- (b) Good Operating Condition Criteria for U.S. EPA Certified SmartWay Trailer Aerodynamic Technologies
- (1) Aerodynamic technologies installed on a box-type trailer must meet the following criteria:
 - (A) The aerodynamic technologies must be installed in accordance with the manufacturer's specifications.
 - (8) The aerodynamic technologies must be securely fastened to the trailer.
 - (C) The aerodynamic technologies must not be used with missing sections.
 - (D) The aerodynamic technologies must not be used if damaged to such an extent as to compromise their aerodynamic effectiveness.
 - (E) The rear trailer aerodynamic technology must be capable of being folded back against the trailer sides or otherwise be readily compacted to allow normal functioning of doors.

NOTE: Authority cited: Sections 39600, 39601, 38510, 38560, and 38560.5, Health and Safety Code. Reference: Sections 39600, 38560, 38560.5, and 38580, Health and Safety Code.

95305 Exemptions.

- (a) A short-haul tractor may, pursuant to section 95306, *Short-Haul Tractor and Short-Haul Trailer Exemption Requirements*, be exempted from the requirements of section 95303 (a), provided it either:
 - (1) Travels no more than 50,000 miles per year; or
 - (2) Operates only within a 100-mile radius of its local haul base.
- (b) A short-haul trailer may, pursuant to section 95306, *Short-Haul Tractor and Short-Haul Trailer Exemption Requirements*, be exempted from the requirements of section 95303(b), provided it operates only within a 100 mile radius of its local haul base.

- (c) A 53-foot or longer box-type trailer pulled by a short-haul tractor that has been exempted pursuant to section 95306, *Short-Haul Tractor and Short-Haul Trailer Exemption. Requirements*, is itself exempt from the requirements of 95303(b) while it is being pulled by the registered short-haul tractor.
- (d) A drayage tractor pulling a 53-foot or longer box-type trailer **within** 100 miles of the port or intermodal rail yard property of origin or destination and the trailer it pulls are exempt from sections 95303(a) and (b).

NOTE: Authority cited: Sections 39600, 39601, 38510, 38560, and 38560.5, Health and Safety Code. Reference: Sections 39600, 38560, 38560.5, and 38580, Health and Safety Code.

95306 Short-Haul Tractor and Short-Haul Trailer Exemption Requirements

- (a) Application Requirements: The owner of an HD tractor or the owner of a 53-foot or longer box-type trailer that wishes to obtain a short-haul exemption as provided in section 95305(a) or (b) must submit to the Executive Officer the information identified in subsections (b) through (g). Applications will be reviewed by the Executive Officer as received. The Executive Officer may request additional information, or clarification of submitted information, during review of the application. Applicants will be notified of the status of their applications by letter from the Executive Officer no later than 30 days after receipt of their application. If approved, the exemption status will be effective upon the date of the approval letter. If denied, the reasons for denial will be identified, and the applicant can resubmit an amended application.
- (b) Owner Contact Information:
 - (1) Short-haul tractor owner's name (if applicable)
 - (2) Short-haul trailer owner's name (if applicable)
 - (3) Name of owner's company (if applicable)
 - (4) Corporate parent (if applicable)
 - (5) Motor carrier identification number
 - (6) IRP registration number (if applicable)
 - (7) Street address of owner or owner's company
 - (8) Telephone number of owner or owner's company

- (9) Email address of owner or owner's company (if available)
- (10) Company taxpayer identification number (if applicable)
- (c) Local Haul Base Information:
 - (1) Local haul base contact's name
 - (2) Contact's title
 - (3) Street address of local haul base
 - (4) Telephone number of local haul base
- (d) Tractor Information. For each tractor to be exempted, provide the following information:
 - (1) Type of exemption applied for:
 - (A). Limit annual miles traveled to 50,000; or
 - (B) Limit total area of operation to within a 100 mile radius from its local base.
 - (2) Tractor identification number (vehicle identification number (VIN))
 - (3) Tractor make
 - (4) Tractor model
 - (5) Tractor model year
 - (6) State of registration
 - (7) License plate number
 - (8) Odometer reading (if annual miles traveled is to be limited)
- (e) Trailer Information. For each trailer to be exempted, provide the following information:
 - (1) Trailer type (dry van or refrigerated van)
 - (2) Trailer identification number
 - (3) Trailer make

- (4) Trailer model
 - (5) Trailer model year
 - (6) State of registration
 - (7) License plate number
- (f) For trailers and for all tractors limited in operation to a 100-mile radius from their local haul base, provide a street map of the geographic area where tractors will be operating and the location (address) of the local haul base(s).
- (g) Include one of the following statements at the end of the application, above the applicant's signature and date:
- (1) For all trailers and for trucks limited in operation to a 100-mile radius from their local haul base: .

"I agree to strictly limit all use of this [or these] tractor[s][or trailer[s]] to the area Within a 100-mile radius of the local haul base identified in this application if the exemption is approved by the Air Resources Board Executive Officer. I understand that if the exemption is approved, operation of the equipment outside this area will be a violation of sections 95300-95312, title 17, California Code of Regulations, and know that I must submit an application for any extension of the exemption no more than 11 months after the date of the letter approving the exemption. I declare under penalty of perjury that the information provided in this application is true, accurate and complete." .

- (2) For trucks that will be used no more than 50,000 miles per year:

"I agree to limit use of this [or these] tractor[s] to 50,000 or fewer miles per year if the exemption is approved by the Air Resources Board Executive Officer. I understand that if the exemption is approved, operation of the equipment more than 50,000 miles will be a violation of sections 95300-95312, title 17, California Code of Regulations, and know that I must submit an application for any extension of the exemption no more than 11 months after the date of the letter approving the exemption. I declare under penalty of perjury that the information provided in this application is true, accurate and complete."

- (h) An exemption approved under this section will be in effect for a period of one year from the date of the approval letter. To extend the exemption, an applicant

must reapply for the extension at least one month prior to the expiration date of the exemption.

- (i) The driver of an exempt short-haul HD tractor must, upon demand, provide the following information to authorized enforcement personnel identified in section 95309:
 - (1) Driver's license
 - (2) Odometer reading of tractor
 - (3) Tractor registration
 - (4) Origin of freight being transported
 - (5) Destination of freight being transported
 - (6) If dispatched by motor carrier, motor carrier information defined in section 95303(g)(1)(B).
 - (7) If dispatched by broker, broker information defined in section 95303(f)(1)(B).

NOTE: Authority cited: Sections 39600, 39601, 38510, 38560, and 38560.5, Health and Safety Code. Reference: Sections 39600, 38560, 38560.5, and 38580, Health and Safety Code.

95307 Optional Trailer Fleet Compliance Schedules.

In lieu of meeting the January 1, 2013 compliance deadline set forth in section 95303(b)(3), an owner of one or more 2010 or previous model year 53-foot or longer box-type trailers may bring such trailers into compliance in accordance with an applicable compliance schedule set forth below.

For the purposes of the optional trailer fleet compliance schedules in this section, bringing a trailer into "compliance" means retrofitting such trailer with the necessary tires and aerodynamic technologies to meet the applicable trailer requirements in sections 95303(b)(1) and 95303(b)(2) or retiring such trailer from California service. In addition, a "trailer" means a 53-foot or longer box-type trailer, and a "nonconforming trailer" means a trailer that is not U.S. EPA SmartWay Certified nor is it yet equipped with the necessary technologies specified in sections 95303(b)(1)(B) or 95303(b)(2)(B), as applicable.

The two compliance schedules available are the large fleet compliance schedule for fleets of 21 or more trailers and the small fleet compliance schedule for fleets of 20 or fewer trailers. Fleets with 21 or more total trailers may not participate in the small fleet

compliance schedule. However, fleets with 20 or fewer total trailers may participate in either the large fleet or small fleet compliance schedule.

To determine fleet size, a trailer owner must account for all 53-foot or longer box-type trailers (both dry-van and refrigerated-van trailers) within the fleet. A trailer owner must list all these trailers on the trailer fleet list, as defined in subsection (c)(2) to be eligible to participate in an optional trailer fleet compliance schedule. The trailer fleet list must be submitted within the compliance plan, as defined in subsection (a)(2) or (b)(2), as applicable, by the due date specified in the applicable compliance schedule. Only trailers listed on the trailer fleet list are eligible to be brought into compliance in accordance with an applicable compliance schedule. Except as provided in subsection (a)(3), a compliance plan revision may only be made with the approval of the Executive Officer when the Executive Officer determines that a company merger, acquisition, or split, or other changed circumstances affecting operations of the owner, necessitate revisions in the compliance plan. Executive Officer approval will not be granted to allow a new business to participate in a compliance schedule after the submission due date for the applicable compliance plan has passed.

Refrigerated-van trailers not brought into compliance in accordance with the refrigerated fleet compliance provision set forth in section 95308 may either be brought into compliance in accordance with an applicable large fleet or small fleet compliance schedule or before the January 1, 2013 compliance deadline.

Although a fleet's participation in an optional trailer fleet compliance schedule does not require the Executive Officer's specific approval, the Executive Officer may terminate a fleet's participation in a compliance schedule if the fleet, or any tractor or trailer within the fleet, is found in violation of this regulation. Should the Executive Officer terminate a fleet's participation in a compliance schedule, the owner must bring all trailers into compliance within 90 days or by December 31, 2012, whichever is later, but in no case later than December 31 of the final compliance year of the applicable compliance schedule.

The Executive Officer may make information provided-pursuant to an optional *trailer* fleet compliance schedule available to the public for the purpose of helping determine the compliance status of a trailer..

(a) Large Fleet Compliance Schedule

- (1) Minimum fleet compliance thresholds: A trailer owner participating in the large fleet compliance schedule must ensure that the percentage of compliant trailers on the compliance base list, as defined in subsection (c)(3), is equal to or greater than:
 - (A) 5 percent by December 31, 2010,
 - (B) 15 percent by December 31, 2011,

- (C) 30 percent by December 31, 2012,
- (D) 50 percent by December 31, 2013,
- (E) 75 percent by December 31, 2014, and
- (F) 100 percent by December 31, 2015.

Table 1: Minimum Fleet Compliance Thresholds
for the
Large Fleet Compliance Schedule

Compliance Year (Y)	Minimum Fleet Compliance Threshold (P _Y)
2010	5%
2011	15%
2012	30%
2013	50%
2014	75%
2015	100%

- (2) Large fleet compliance plan: To participate in the large fleet compliance schedule, a trailer owner must provide the following information to the Executive Officer, in a document entitled "Large Fleet Compliance Plan," by July 1, 2010. This document must include the following:
 - (A) Statement of intent, in accordance with subsection (c)(1).
 - (8) Trailer fleet list, in accordance with subsection (c)(2).
 - (C) Copy of registration for each trailer listed on the trailer fleet list.
 - (D) Large fleet compliance base number, calculated in accordance with subsection (d)(1).
 - (E) Compliance base list, in accordance with subsection (c)(3).
 - (F) Annual compliance number for each compliance year, calculated in accordance with subsection (d)(5).
 - (G) Annual compliance commitment list for each compliance year, in accordance with subsection (c)(4).
 - (H) Early compliance option reporting, if applicable: If a trailer owner elects to delay trailer retrofits and retirements in accordance with subsection (a)(4), *Early compliance option*, such owner must submit the following trailer information within the compliance plan:

1. Early compliance trailer number: The number of trailers that are in compliance by December 31, 2009 and are used to delay the retrofit or retirement of delayed compliance trailers, as defined in subsection (a)(4).
 2. Early compliance trailer list: A trailer owner participating in the early compliance option must identify on the trailer fleet list all early compliance trailers.
 3. Evidentiary documentation for early compliance trailers: In order for the Executive Officer to recognize early compliance trailers, a trailer owner must submit proper evidentiary documentation, such as purchase receipts, demonstrating that, by December 31, 2009, such trailers were already in compliance. In lieu of purchase receipts, other documentation may also be acceptable as determined by the Executive Officer.
 4. Delayed compliance trailer number, calculated in accordance with subsection (d)(3).
 5. Delayed compliance trailer list: A trailer owner participating in the early compliance option must identify on the trailer fleet list all delayed compliance trailers.
- (3) Large fleet compliance plan revision: A trailer owner may make certain reVisions to retrofit and retirement commitments scheduled for compliance years four, five, and six, by submitting a document titled, "Large Fleet Compliance Plan Revision," by JULY 1, 2013. By submitting this document, a trailer owner may re-designate trailer retrofit and retirement commitments within compliance years four, five, and six, so long as the number of trailers that are brought into compliance each compliance year does not change.
- (4) Early compliance option: Under the **early** compliance option, a trailer owner may delay the retrofit or retirement of 1.5 nonconforming trailers until 2016 for every one trailer that is in compliance by December 31, 2009. For the purposes of the early compliance option, an "early compliance trailer" means a trailer that is in compliance by December 31, 2009 and for which the fleet receives credit towards delaying the retrofit or retirement of other trailers until 2016. In addition, a "delayed compliance trailer" means a trailer for which compliance will be delayed until 2016.
- (A) Maximum allowable delayed compliance trailers: A trailer owner participating in the early compliance option may not delay the compliance of more trailers than the equivalent of 30 percent of the sum of all trailers within the compliance base and the total **number** of

early compliance trailers. For verification purposes, the maximum allowable delayed compliance trailer number may be calculated in accordance with subsection (d)(4).

- (8) A trailer owner must bring all delayed compliance trailers into compliance by December 31, 2016.
- (C) Early compliance option report: To participate in the early compliance option, a trailer owner must submit all information required by subsection (a)(2)(H), *Early compliance option report*, by July 1, 2010, in the large fleet compliance plan.

(b) Small fleet compliance schedule

- (1) Minimum fleet compliance thresholds: A trailer owner participating in the small fleet compliance schedule must ensure that the percentage of compliant trailers on the compliance base list, as defined in subsection (c)(3), is equal to or greater than:
 - (A) 25 percent by December 31, 2013,
 - (8) 50 percent by December 31, 2014,
 - (C) 75 percent by December 31, 2015, and
 - (D) 100 percent by December 31, 2016.

Table 2: Minimum Fleet Compliance Thresholds for the Small Fleet Compliance Schedule

Compliance Year (Y)	Minimum Fleet Compliance Threshold (Py)
2013	25%
2014	50%
2015	75%
2016	100%

- (2) Small fleet compliance plan: To participate in the small fleet compliance schedule, a trailer owner must provide the following information to the Executive Officer, in a document entitled "Small Fleet Compliance Plan," by July 1, 2012. This document must include the following:
 - (A) Statement of intent, in accordance with subsection (c)(1).
 - (8) Trailer fleet list, in accordance with subsection (c)(2).
 - (C) Copy of registration for each trailer listed on the trailer fleet list.

- (D) Small fleet compliance base number, calculated in accordance with subsection (d)(2).
- (E) Compliance base list, in accordance with subsection (c)(3)
- (F) Annual compliance number for each compliance year, calculated in accordance with subsection (d)(5).
- (G) Annual compliance commitment list for each compliance year, in accordance with (c)(4).

(c) General Compliance Plan Components

- (1) Statement of intent: The statement of intent must be provided to the Executive Officer by the due date specified in the applicable compliance schedule. The statement of intent must include the following:
 - (A) A statement indicating that the trailer owner elects to participate in an optional trailer fleet compliance schedule.
 - (8) A statement identifying the compliance schedule in which the trailer owner elects to participate.
 - (C) For trailer owners electing to participate in the small fleet compliance schedule, a statement affirming that such owner's trailer fleet contains 20 or fewer 53-foot or longer box-type trailers.
 - (D) A statement affirming that, except for exempted trailers and trailers to be brought into compliance in accordance with the refrigerated fleet compliance provision, the trailer owner will bring all nonconforming trailers into compliance in accordance with the applicable compliance schedule.
 - (E) A statement affirming that the trailer owner understands that participation in an applicable compliance schedule may be terminated by the Executive Officer should any vehicles be found in violation of this regulation.
 - (F) A statement affirming that the trailer owner understands that if participation in a compliance schedule is terminated by the Executive Officer, the owner must bring all affected trailers into compliance within 90 days or by December 31, 2012, whichever is later, but no later than December 31 of the final compliance year of the applicable compliance schedule.

- (G) A statement affirming that the trailer owner understands that if participation in an applicable trailer fleet compliance schedule is withdrawn, such owner may not operate a nonconforming trailer on a California highway after December 31, 2012, except for refrigerated-van trailers that will be brought into compliance in accordance with the refrigerated fleet compliance provision.
 - (H) A statement affirming that the trailer owner agrees to allow the Executive Officer, or any person authorized by the Executive Officer, to conduct periodic audits of vehicles and records to ensure compliance with the applicable compliance schedule, this regulation, and other air quality regulations.
 - (I) A signature of the trailer owner or a corporate official affirming that all information contained within the compliance plan, including information contained within the statement of intent and the trailer fleet list, is true and correct.
- (2) Trailer fleet list: The trailer fleet list must be provided to the Executive Officer by the due date specified in the applicable compliance schedule. Except upon specific Executive Officer approval, the trailer owner may not change the number or identity of trailers included on the trailer fleet list once the submission due date for the applicable compliance plan has passed. The trailer fleet list must include the following:
- (A) Owner's name
 - (8) Name of company or agency
 - (C) Corporate parent (if applicable)
 - (D) Physical address
 - (E) Mailing address
 - (F) Physical address of location where records pertaining to the applicable compliance schedule will be maintained
 - (G) Name of contact person
 - (H) Telephone number
 - (I) Email address (if available)
 - (J) Company taxpayer identification number

- (K) List of all 2010 and previous model-year 53-foot or longer box-type trailers that operate in California, including compliant, nonconforming, and exempted trailers.

For each trailer listed, provide the following:

1. Trailer type (dry van or refrigerated van)
2. Trailer make
3. Trailer model
4. Trailer model year
5. License plate number
6. State of registration
7. Compliance status (compliant, nonconforming, or exempted)

For each refrigerated-van trailer listed, also provide the following:

8. Transport refrigeration unit make
9. Transport refrigeration unit model
10. Transport refrigeration unit model year
11. Transport refrigeration unit serial number
12. Transport refrigeration unit engine make
13. Transport refrigeration unit engine model
14. Transport refrigeration unit engine model year
15. Transport refrigeration unit engine serial number

- (3) Compliance base list: The compliance base list is the subset of nonconforming trailers identified in the trailer fleet list, in accordance with subsection (c)(2)(K), that will be brought into compliance in accordance with the applicable compliance schedule. The compliance base list shall not include the following trailers:

- (A) Exempted trailers

- (8) Refrigerated-van trailers to be brought into compliance in "accordance with the refrigerated fleet compliance provision
- (C) Early compliance trailers used to delay the retrofits and retirements of delayed compliance trailers, if applicable
- (D) Delayed compliance trailers, if applicable

Trailers that are in compliance by December 31, 2009 and not used to delay the retrofit or retirement of delayed compliance trailers may also be included on the compliance base list and used to meet minimum fleet compliance thresholds.

- (4) Annual compliance commitment list: The compliance commitment list is the subset of trailers within the compliance base list that the owner commits to bring into compliance by December 31 of that compliance year. For each year's annual compliance commitment list, the trailer owner must list a sufficient number of trailers to meet or exceed the annual compliance number for that same year. On the annual compliance commitment list, the trailer owner must list all trailers by their license plate number and state of registration, or by another method acceptable to the Executive Officer, which also allows for the identification of these trailers on the owner's trailer fleet list.

(d) Calculation Methodology

- (1) Large fleet compliance base number: The compliance base number for large fleets is the number of trailers that a trailer owner elects to bring into compliance in accordance with the large fleet compliance schedule.

$$N_B = N_T - N_{2016} - N_E - N_R - N_X \quad (\text{Equation 1})$$

"NB" = Large fleet base number

"NT" = Total number of trailers listed on the trailer fleet list

"N₂₀₁₆" = Delayed compliance trailer number, as determined in accordance with (d)(3), if applicable

"NE" = Number of early compliance trailers, if applicable

"NR" = Number of nonconforming refrigerated-van trailers that will be brought into compliance in accordance with the refrigerated fleet compliance provision set forth in section 95308, if applicable

"N_x" = Number of trailers with a compliance status of "exempted" on the trailer fleet list, if applicable

- (2) Small fleet compliance base number: The compliance base number for small fleets is the number of trailers that a trailer owner elects to bring into compliance in accordance with the small fleet compliance schedule.

$$N_B = N_T - N_R - N_x \quad (\text{Equation 2})$$

"N_a" = Small fleet base number

"N_T" = Total number of trailers listed on the trailer fleet list

"N_R" = Number of nonconforming refrigerated trailers that will be brought into compliance in accordance with the refrigerated fleet compliance provision set forth in section 95308, if applicable

"N_x" = Number of trailers with a compliance status of "exempted" on the trailer fleet list, if applicable

- (3) Delayed compliance trailer number: The delayed compliance trailer number is the number of trailers for which compliance may be delayed until 2016, pursuant to subsection (a)(4), *Early Compliance Option*.

$$N_{2016} = N_E \times 1.5 \quad (\text{Equation 4})$$

"N₂₀₁₆" = Delayed compliance trailer number, if applicable. If N₂₀₁₆ is not a whole number, round down to the next whole number.

"N_E" = Number of early compliance trailers

- (4) Maximum allowable delayed compliance trailer number: The resultant number must be rounded down to the nearest whole trailer

$$N_{2016, \max} = (N_a + N_E) \times 0.30 \quad (\text{Equation 3})$$

"N_{2016, max}" = Maximum allowable delayed compliance trailer number. If N_{2016, max} is not a whole number, round down to the next whole number.

"N_a" = Large fleet base number, as determined in accordance with subsection (d)(1)

"N_E" = Number of early compliance trailers

- (5) Annual compliance number: The annual compliance number is the number of trailers that a trailer owner must bring into compliance by December 31 of a particular year to ensure that the percentage of compliant trailers within the compliance base meets or exceeds the minimum fleet compliance threshold for that year.

$$N_y = (NB \times P_y/100) - N_{c, y-1} \quad (\text{Equation 5})$$

"N_y" = Annual compliance number for compliance year V. If N_y is not a whole number, round up to the next whole number if the fractional part is equal to or greater than 0.5, and round down if less than 0.5.

"NB" = Large fleet or small fleet base number, as determined in accordance with subsection (d)(1) for large fleets or (d)(2) for small fleets

"P_y" = Minimum fleet compliance threshold for compliance year V, as defined in subsection (a)(1) for large fleets and (b)(1) for small fleets

"N_{c, y-1}" = Total number of trailers within the compliance base that would already be in compliance prior to January 1 of compliance year V. This number does not include early compliance trailers for which a fleet has *received* credit towards delaying the compliance of other trailers, pursuant to subsection (a)(4), *Early Compliance Option*.

- (e) General requirements for all compliance schedules: To participate in an applicable trailer fleet compliance schedule, a trailer owner must comply with the following requirements.
- (1) The trailer owner must ensure that, by December 31 of each compliance year, the percentage of compliant trailers within the owner's compliance base is equal to or greater than the applicable minimum fleet compliance threshold for that compliance year.
 - (2) The trailer owner must ensure that the number of trailers listed on each compliance year's annual compliance commitment list is equal to or greater than the applicable annual compliance number for that compliance year.
 - (3) The trailer owner must bring into compliance all trailers listed in each compliance year's annual compliance commitment list by December 31 of that compliance year.

- (4) The trailer owner must allow ARB representatives, or any other authorized enforcement personnel, to conduct periodic audits of records and equipment to verify compliance with an applicable compliance schedule, the owner's compliance plan, and other applicable air quality regulations.
- (5) Should the Executive Officer terminate the trailer owner's participation in a trailer fleet compliance schedule, such trailer owner must bring all trailers into compliance within 90 days of such termination or by December 31, 2012, whichever is later, but no later than December 31 of the final compliance year of the applicable compliance schedule.
- (6) After December 31, 2012, except for eligible refrigerated-van trailers that the trailer owner elects to bring into compliance in accordance with the refrigerated fleet compliance provision and exempted trailers, the trailer owner may not allow the operation of a nonconforming trailer on a California highway if such owner withdraws participation from an applicable trailer fleet compliance schedule.
- (7) The trailer owner must provide to the Executive Officer any documentation and information required by an applicable trailer fleet compliance schedule by the due date specified in such compliance schedule.
- (8) The trailer owner must ensure that all information and documentation provided to the Executive Officer is accurate and true.
- (9) The trailer owner must ensure that all required information and documentation arrives at ARB by applicable due dates. The Executive Officer will not be responsible for materials lost in transit.
- (10) If participating in the large fleet compliance schedule, the trailer owner must continue bringing trailers into compliance in accordance with the original compliance plan if a large fleet compliance plan revision is not submitted.
- (11) The trailer owner must maintain all documentation pertaining to an applicable compliance schedule at the location indicated on the trailer fleet list.
- (12) Upon the request of an ARB representative or other authorized enforcement personnel, the trailer owner must provide all information and documentation necessary to verify compliance with the applicable compliance schedule, such owner's compliance plan, and any other air quality regulation.

- (13) A trailer owner may not allow a nonconforming trailer that will be brought into compliance in accordance with an applicable trailer fleet compliance schedule to operate on a California highway after December 31, 2012 unless such trailer is listed on the owner's trailer fleet list and the owner remains eligible to participate in the trailer fleet compliance schedule.
- (14) A trailer owner who is participating, or has participated, in a trailer fleet compliance schedule may not allow a nonconforming trailer that will be brought into compliance in accordance with the refrigerated fleet compliance provision to operate on a California highway after December 31, 2012 unless such trailer is listed on such owner's trailer fleet list.
- (15) The trailer owner may not allow the operation of a nonconforming trailer on a California Highway after December 31 of the compliance year in which the trailer was identified on the annual compliance commitment list.

NOTE: Authority cited: Sections 39600,39601,38510,38560, and 38560.5, Health and Safety Code. Reference: Sections 39600,38560,38560.5, and 38580, Health and Safety Code.

95308 Refrigerated Fleet Compliance Provision.

A trailer owner may bring 2003 through 2008 model-year 53-foot or longer refrigerated-van trailers equipped with 2003 and subsequent model-year TRUs into compliance in accordance with the refrigerated fleet compliance provision in lieu of meeting the January 1, 2013 compliance deadline set forth in section 95303(b)(3) or bringing such trailers into compliance in accordance with an applicable trailer fleet compliance schedule.

For the purposes of this subsection, bringing a trailer into "compliance" means retrofitting such trailer with the necessary technologies to meet the trailer requirements set forth in section 95303(b)(2) of this article or retiring such trailer from California service. In addition, a "trailer" means a 53-foot or longer box-type trailer, and a "nonconforming trailer" means a trailer that is not U.S. EPA SmartWay Certified nor is it yet equipped with the necessary technologies specified in section 95303(b)(2)(B).

If also participating in an optional trailer fleet compliance schedule, a trailer owner may only bring a refrigerated-van trailer into compliance in accordance with this provision if such trailer is included on the trailer fleet list, as submitted in the applicable compliance plan.

A nonconforming refrigerated-van trailer may not operate on a California Highway after December 31, 2012 unless such trailer is being brought into compliance under an applicable trailer fleet compliance schedule or has been reported in accordance with the refrigerated fleet compliance provision and is eligible to be brought into compliance in accordance with the refrigerated fleet compliance provision.

The Executive Officer may make information provided pursuant to the refrigerated fleet compliance provision available to the public for the purpose of helping determine the compliance status of a trailer.

- (a) Refrigerated trailer compliance deadlines: A trailer owner electing to bring refrigerated-van trailers into compliance in accordance with the refrigerated fleet compliance provision must:
- (1) Bring all 2003 and 2004 model year 53-foot or longer refrigerated-van trailers into compliance by December 31, 2017. A trailer owner subjected to this provision may not operate a nonconforming 2003 or 2004 model year refrigerated-van trailer on a California highway after December 31, 2017.
 - (2) Bring all 2005 and 2006 model year 53-foot or longer refrigerated-van trailers into compliance by December 31, 2018. A trailer owner subjected to this provision may not operate a nonconforming 2005 or 2006 model year refrigerated-van trailer on a California highway after December 31, 2018.
 - (3) Bring all 2007 and 2008 model year 53-foot or longer refrigerated-van trailers into compliance by December 31, 2019. A trailer owner subjected to this provision may not operate a nonconforming 2007 or 2008 model year refrigerated-van trailer on a California highway after December 31, 2019:

Table 3: Refrigerated Fleet Compliance Deadlines

Compliance Deadlines	Affected Trailer Model Years
December 31, 2017	2003, 2004
December 31, 2018	2005, 2006
December 31, 2019	2007, 2008

- (b) Refrigerated fleet compliance report: To be eligible to bring trailers into compliance in accordance with the refrigerated fleet compliance provision, a trailer owner must provide the following information, in a document entitled "Refrigerated Fleet Compliance Report," by July 1, 2012. This document must include:
- (1) If participating in an optional trailer fleet compliance schedule, the applicable trailer fleet list, prepared in accordance with section 95307 (c)(2), including the identification of all trailers that the owner elects to bring into compliance in accordance with the refrigerated fleet compliance provision

- (2) If not participating in an optional trailer fleet compliance schedule, a refrigerated trailer fleet list, which must include the following information:
- (A) List of all trailers that the trailer owner will bring into compliance in accordance with the refrigerated fleet compliance provision.
 - (B) Owner's name
 - (C) Name of company or agency
 - (D) Corporate parent (if applicable)
 - (E) Physical address
 - (F) Mailing address
 - (G) Physical address of location where records pertaining to the applicable compliance schedule will be maintained
 - (H) Name of contact *person*
 - (I) Telephone number
 - (J) Email address (if available)
 - (K) Company taxpayer identification number
 - (L) For each trailer listed:
 - 1. Trailer make
 - 2. Trailer model
 - 3. Trailer model year
 - 4. License plate number
 - 5. State of registration
 - 6. Transport refrigeration unit make
 - 7. Transport refrigeration unit model
 - 8. Transport refrigeration unit model year

9. Transport refrigeration unit serial number
 10. Transport refrigeration unit engine make
 11. Transport refrigeration unit engine model
 12. Transport refrigeration unit engine model year
 13. Transport refrigeration unit engine serial number
- (3) Copy of registration for all trailers that the owner will bring into compliance in accordance with the refrigerated fleet compliance provision.
- (4) Statement of intent, which includes the following:
- (A) A statement affirming that the owner elects to bring applicable trailers into compliance in accordance with the refrigerated fleet compliance schedule.
 - (8) A statement affirming that all trailers that the trailer owner elects to bring into compliance in accordance with the refrigerated fleet compliance provision are 2003 through 2008 model year 53-foot or longer refrigerated-van trailers with 2003 and subsequent model year TRUs.
 - (C) A statement affirming that all affected trailers will be brought into compliance by the applicable compliance deadlines specified in subsection (a), Refrigerated trailer compliance deadlines.
 - (D) A signature of the trailer owner or a corporate official affirming that all information contained within the refrigerated fleet compliance report, including information contained within the statement of intent and the trailer fleet list, is true and correct.
- (c) Other Requirements
- (1) Only refrigerated-van trailers equipped with a functional TRU are eligible to be brought into compliance in accordance with the refrigerated fleet compliance provision.
 - (2) For applicable refrigerated fleets that begin service in California after December 31, 2012, the refrigerated fleet compliance report must be submitted to the Executive Officer prior to operating any nonconforming 2003 through 2008 model-year 53-foot or longer refrigerated-van trailer equipped with 2003 and subsequent model-year TRUs on a California highway.

- (3) If the trailer owner elects to begin participation in the refrigerated fleet compliance provision after December 31, 2016, such fleet must ensure that all trailers subjected to previous deadlines, as applicable, are in compliance.
- (4) Notwithstanding any other requirements of the refrigerated fleet compliance provision, a trailer owner may not allow any nonconforming refrigerated-van trailer subjected to this regulation to operate on a California highway after December 31, 2019.

NOTE: Authority cited: Sections 39600, 39601, 38510, 38560, and 38560.5, Health and Safety Code. Reference: Sections 39600, 38560, 38560.5, and 38580, Health and Safety Code.

95309 Enforcement.

Enforcement of this subarticle may be carried out by authorized representatives of the ARB, peace officers as defined in California Penal Code, title 3, chapter 4.5, sections 830 et seq. and their respective law enforcement agencies; and authorized representatives of air pollution control or air quality management districts.

NOTE: Authority cited: Sections 39600, 39601, 38510, 38560, and 38560.5, Health and Safety Code. Reference: Sections 39600, 38560, 38560.5, and 38580, Health and Safety Code.

95310 Right of Entry

For purposes of inspecting HD tractors and box-type trailers covered in the subarticle, and inspecting or auditing the records of drivers, owners of trailers and tractors, motor carriers, California-based brokers, and California-based shippers to determine compliance with this subarticle, an agent or employee of ARB, upon presentation of proper credentials, has the right to enter any facility (with any necessary safety clearances) where HD tractors and box-type trailers are located or HD tractor and box-type trailer records, including dispatch records, are kept.

NOTE: Authority cited: Sections 39600, 39601, 38510, 38560, and 38560.5, Health and Safety Code. Reference: Sections 39600, 38560, 38560.5, and 38580, Health and Safety Code.

95311 Penalties.

As provided in Health and Safety Code section 38580, any person who violates any requirement of this subarticle is subject to the penalties set forth in Article 3 (commencing with section 42400) of Chapter 4 of Part 4, Division 26 of the Health and

Safety Code. Failure to comply with any requirement of this subarticle shall constitute a single, separate violation for each day during any portion of which the person is not in compliance.

NOTE: Authority cited: Sections 39600,39601,38510,38560, and 38560.5, Health and Safety Code. Reference: Sections 39600,38560,38560.5, and 38580, Health and Safety Code.

95312 Severability.

If any subsection, paragraph, subparagraph, sentence, clause, phrase, or portion of the subarticle is, for any reason, held invalid, unconstitutional, or unenforceable by any court of competent jurisdiction, such portion shall be deemed as a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions of this subarticle

NOTE: Authority cited: Sections 39600,39601,38510,38560, and 38560.5, Health and Safety Code. Reference: Sections 39600, 38560, 38560.5, and 38580, Health and Safety Code.

Appendix B:
Workshop Notice Flyers



SOLICITATION FOR COMMENTS

Proposed Regulation Affecting Long-Haul Tractors and 53-Foot and Longer Box-Type Trailers



The California Air Resources Board (ARB) is currently developing a regulation to reduce greenhouse gas emissions from long-haul tractors that pull 53-foot and longer box-type trailers in California. The proposed regulation would require these tractors and their trailers to use technologies that reduce aerodynamic drag and rolling resistance to improve fuel economy. It would also require all those responsible for transporting goods in these vehicles to ensure that they comply. We strongly encourage you to provide feedback and comments on the proposed requirements *NOW* since our finalized proposal will be completed by mid-August 2008.

Who would be responsible for compliance?

- Drivers
- Owner/Operators
- California businesses (e.g., manufacturers, distributors, retailers, etc.) that ship or receive freight in 53-foot or longer box-type trailers.
- Motor Carriers
- Brokers

What vehicles would be affected?

- Long-haul tractors that pull 53-foot or longer box-type trailers
- 53-foot or longer box-type trailers pulled by long-haul tractors

This proposed regulation would impact all tractors and trailers that operate in California regardless of where the vehicles are registered. This means that out-of-state, Canadian, and Mexican tractors and trailers that operate in California would also have to comply with the proposed regulation's provisions.

What are the proposed requirements?

- Existing tractors (pre-2011 model year) must use SmartWay-certified low-rolling resistance tires.
- New tractors (2011 + model year) must be SmartWay-certified.
- New and existing trailers must use SmartWay-certified low-rolling resistance tires.
- New and existing trailers must reduce aerodynamic drag by using technologies such as front fairings/gap reducers, trailer skirts, and rear trailer tail fairings.

When would these proposed requirements become effective?

The first phase of this regulation is proposed to become effective on January 1, 2010.

How can I participate in this rulemaking?

ARB strongly encourages your participation in the development of this proposed regulation. We need your comments *NOW* since our finalized proposal will be completed by mid-August 2008. We currently have three workshops scheduled for July and August 2008:

- Sacramento on July 28, 2008
- Otay Mesa (San Diego) on July 29, 2008
- El Monte on August 5, 2008

Please see our meetings webpage for more information about these workshops:
<http://www.arb.ca.gov/cc/hdghg/meetings/meetings.htm>.

Where can I find out more?

- Visit our webpage at <http://www.arb.ca.gov/cc/hdghg/hdghg.htm>.
- Join our email list at <http://www.arb.ca.gov/listserv/smartway.htm>.
- Contact one of the following staff:

David Chen at (626) 575-6673 or dchen@arb.ca.gov Dassi Pintar at (626) 575-7007 or hpintar@arb.ca.gov



SOLICITACIÓN DE COMENTARIOS

Regulación Propuesta para Tractocamiones de Viajes Largos Y Remolques de Caja de 53 pies de largo y mayores



La Junta de Recursos de Aire de California (ARB, por sus siglas en inglés) está desarrollando actualmente una regulación para las emisiones de gases de efecto invernadero provenientes de tractocamiones que viajan distancias largas en California remolcadas por cajas de 53 pies de largo o mayores. La regulación propuesta requerirá que estos tractocamiones y sus remolques utilicen tecnologías que reduzcan el arrastre aerodinámico y la resistencia al rodamiento de las llantas para mejorar la economía de combustible. . . requerirá a todas aquellas personas responsables de mover mercancías en estos vehículos asegurarse que estos cumplan con la regulación. Lo invitamos a que dé sus opiniones y comentarios acerca de los requerimientos propuestos AHORA ya que nuestra propuesta final será completada para mediados de agosto del 2008.

¿Quién será responsable de cumplir con esta regulación?

- Conductores
- Propietarios/Operadores
- Negocios en California (fabricantes, distribuidores, vendedores al por menor, etc.) que envíen o reciban carga en remolcadas de caja de 53 pies de largo o mayores.
- Autotransportistas
- Brokers/ Corredores

¿Qué vehículos se verán afectados?

- Tractocamiones de viajes largos que remolcan cajas de 53 pies de largo o mayores
- Cajas de 53 pies de largo o mayores remolcadas por tractocamiones de viajes largos

Esta regulación propuesta impactará a todos los tractocamiones y remolques que operan en California sin importar su lugar de registro. Esto significa que los tractocamiones y remolques canadienses, mexicanos y provenientes de otros estados que operen en California tendrán que cumplir con los requerimientos de la regulación propuesta.

¿Cuáles son los requerimientos propuestos?

- Los tractocamiones existentes (modelos anteriores a 2011) deberán usar llantas de baja resistencia al rodamiento con certificación SmartWay.
- Los tractocamiones nuevos (modelos 2011 en adelante) deberán tener la certificación SmartWay
- Los remolques existentes y los remolques nuevos deberán usar llantas de baja resistencia al rodamiento con certificación SmartWay.
- Los remolques existentes y los remolques nuevos deberán reducir el arrastre aerodinámico utilizando tecnologías tales como deflectores de aire frontales/reductores del espacio entre el remolque, faldones laterales y deflectores traseros para el remolque.

¿Cuándo entrarán en vigor los requerimientos propuestos?

La primera fase de esta regulación está propuesta para entrar en vigor en enero del 2010.

¿Cómo puedo participar en la creación de esta regulación?

El ARB 10 invita fuertemente a que participe en el desarrollo de esta regulación. Necesitamos sus comentarios AHORA ya que nuestra propuesta final será completada a mediados de agosto del 2008. Actualmente tenemos tres juntas públicas planeadas para los meses de julio y agosto del 2008:

- En Sacramento el 28 de julio del 2008
- En Otay Mesa (San Diego) el 29 de julio del 2008
- En El Monte el 5 de agosto del 2008

Por favor visite nuestra página Web de reuniones para más información acerca de estos talleres:
<http://www.arb.ca.gov/cc/hdghg/meetings/meetings.htm>.

¿Dónde puedo encontrar más información?

- Visite nuestra página Web en <http://www.arb.ca.gov/cc/hdghg/hdghg.htm>.
- Únase a nuestra lista de correos electrónicos en <http://www.arb.ca.gov/listserv/smartway.htm>.
- Contacte a nuestro personal a continuación:



FORUM TO PROVIDE FEEDBACK ON THE PROPOSED
**HEAVY DUTY VEHICLE
 GREENHOUSE GAS EMISSION
 REDUCTION MEASURE***

In Partnership with  *California Environmental Protection Agency*
AIR RESOURCES BOARD

WHO WILL BE IMPACTED?

1. Drivers and owners of long haul tractors operating in California
 2. California businesses, including warehouse distribution centers and manufacturers that ship or receive freight in long haul tractors (Defined as 53' or longer box type trailers)
- Compliance for these **NEW** regulations are phased but start as early as **2010**.

TUESDAY, JULY 29, 2008

SANYO NORTH AMERICA
 2055 Sanyo Avenue, San Diego, CA 92154
 8:30 AM - 11:00 AM

Simultaneous translation and continental breakfast **will be provided**

FREE ADMISSION • RESERVATIONS ARE REQUIRED

.. Established by the Global Warming Solutions Act (AB32)

~~Please fax complete form by JULY 25th to (619) 661-6178~~

Number Attending: _____ - Please re-distribute to your shippers

Name(s): _____

Company: _____

Phone: _____ Fax: _____

E-mail (Required): _____

Otay Mesa Chamber of Commerce
 9163 Siempre Viva Rd., Suite I-2, San Diego, CA 92154. Ph: (619) 661-6111 • Fax: (619) 661-6178

Appendix C:
Emission Inventory Analysis and Results

APPENDIX C: Emission Inventory Development - Analysis and Results

A. Emissions Inventory Data Sources

A variety of data sources were used to establish the tractor and trailer population impacted by the proposed rule. These include the following: ARB Motor Vehicle Emissions Inventory (ARB Inventory), U.S. Bureau of Census 2002 Vehicle Inventory and Use Survey (VIUS)¹, Americas Commercial Transportation Research Company (ACT Research), U.S. Bureau of Census Current Industrial Reports (CIR), and Commercial Carrier Journal. The following sections describe these data sources and the methodology used to estimate the tractor and trailer population impacted by the proposed regulation and the greenhouse gas emission benefits.

1. ARB Heavy-Duty Vehicle Inventory

On-road mobile source emissions in California are currently calculated using the EMFAC2007 (ARB, 2006) model that was released in December of 2006. Since the last EMFAC release, ARB staff members have conducted a re-evaluation of the heavy duty diesel truck emissions inventory to support the Proposed Regulation to Reduce Emissions from In-Use On-Road Diesel Vehicles. In developing this new analysis, staff has integrated new data and assumptions into an expanded methodology that builds upon current modeling in EMFAC2007. The updated inventory categorizes heavy-duty vehicles into separate inventory groups by body type and operational characteristics while keeping the existing weight class based vehicle categories (medium-heavy and heavy-heavy duty vehicle classes). Within the existing weight class groups, the updated inventory categorizes vehicles into California registered and out-of-state registered vehicles. California registered trucks are further split into intrastate and interstate trucks while the out-of-state registered trucks are split into trucks based in neighboring states and trucks based in non-neighboring states. The intrastate trucks are further sub-grouped by body type into single unit trucks and tractors. Also within the intrastate trucks separate inventories are developed for agricultural trucks, port trucks, solid waste collection vehicles, and public and utility fleets. A detailed discussion of the inventory development and data sources used is found in Appendix G, of the *Staff Report: Initial Statement Of Reasons For Proposed Rulemaking Proposed Regulation For In-Use On-Road Diesel Vehicles*' (ARB, 2008a).

The new baseline inventory for selected calendar years is shown in Table C-1 and C-3. Staff used this updated inventory as the basis for developing inventory for this proposal. Since only a subset of the total heavy-duty vehicle inventory is affected by the proposed regulation, the base inventory must be adjusted to determine the fraction of vehicles affected by this proposal. Furthermore, since the proposed regulation applies only to Class 7 and 8 tractors², the medium-heavy duty diesel vehicle inventory shown in Table

¹ <http://www.census.gov/svsd/www/vius/products.html>

² Class 7 tractors are tractors with gross vehicle weight rating between 26,001 and 33,000 pounds while Class 8 tractors' are tractors with gross vehicle weight rating of 33,001 pounds and greater.

C-2, must be adjusted to include only Class 7 tractors. Table C-3 also shows the baseline population and the fraction of VMT accrued inside California by out-of-state, California interstate, and California intrastate heavy-duty vehicles (ARB, 2008a).

Table C-1 - Baseline Class 8 Tractors (ARB, 2008a)

Class 8 Tractors(Gross Vehicle Weight Rating> 33,000 pounds)

	Non-neighboring Out-of-state Tractors	Neighboring Out-of-state Tractors	CA Interstate Tractors	CA Intrastate Tractors
CY	Population			
2010	469,323	43,049	62,239	66,037
2015	543,681	51,132	73,924	78,519
2020	626,853	58,008	83,866	89,294
CY	Vehicle Miles Traveled (10 ⁰ miles per Year)			
2010	3,935	1,274	2,673	3,360
2015	4,661	1,509	3,166	3,980
2020	5,316	1,721	3,611	4,540

Table C-2 - Medium-Heavy Duty Diesel Vehicles (ARB, 2008a).

Medium-Heavy Duty Diesel Vehicles
(Gross Vehicle Weight Rating between 14,001 and 33,000 pounds)

	Out-of-State	CA Interstate	CA intrastate
CY	Population		
2010	7,631	1,752	209,116
2015	8,282	1,901	227,426
2020	8,898	2,042	244,223
CY	Vehicle Miles Traveled 10 ⁰ miles per Year)		
2010	14	24	4,146
2015	15	27	4,517
2020	16	28	4,846

Table C-3 - Population and CA Share of VMT (ARB, 2008a)

CY	Category	Population	CA Share of VMT
Heavy-Heavy Duty Vehicles			
2008	Out-of-State Tractors	492,340	12.1%
2008	CA Interstate Tractors	60,263	57.0%
2008	CA Intrastate Tractors	63,684	100%
Medium-Heavy Duty Vehicles			
2008	Medium-Heavy Intrastate	198,525	100%
2008	Medium-Heavy Interstate	8,896	18.7%

2. 2002 Vehicle Inventory and Use Survey

The VIUS is a stratified statistical data of the nation's trucking fleet collected every 5 years by the Bureau of Census as part of the economic census (Census, 2002). It provides data, at the state and national level, on the physical and operational characteristics of registered private and commercial trucks. Since the state of registration of the truck is provided, a statistical profile of the truck fleet by state can be developed and analyzed to determine the characteristics of the state's trucking fleet. The last survey was conducted in 2002.

3. Bureau of Census, Current Industrial Reports (CIR):

The U.S. Bureau of Census CIR program provides periodic reports on production and shipment of selected products. The CIR provides data on factory shipments of complete truck trailers between 1988 and 2000 (Census, 2000). Staff used these data to determine the fraction of box-type trailers sold each year.

4. ACTResearch, LLC.

ACT Research collects commercial vehicle data from manufacturers, analyses it, and disseminates the results to its subscribers. Among other things, it collects and analyzes data related to North American Class 8 trucks and trailers. Among other things, it collects and analyses data related to North American Class 8 trucks and tractors and trailers. ACT provided staff with information on the fraction of 53-footor longer box-type trailers sold nationwide.

5. Commercial Carrier Magazine (CCJ)

CCJ magazine, published monthly by Randall Reilly Publishing Company, LLC, provides news and business information for professionals responsible for running trucking companies and maintaining equipment. The CCJ publishes once a year, information on the nation's top freight carriers, including the number of tractors and

trailers owned by each company. Carrier performance data from the August 2007 and August 2008 issues of CCJ were used to assess the average ratio of trailers to tractors. Staff used these data to approximate the trailer to tractor ratio which was used to determine the total number of trailers affected by this rule.

B. Fraction of Long Haul Tractors

The VIUS data (Census, 2000) were used to determine the fraction of long haul tractors by base state of registration for California intrastate, California interstate, and neighboring out-of-state tractors. Since ARB inventory does not provide a separate inventory for Class 7 trucks, staff also used the VIUS data to determine the fraction of medium-heavy duty vehicles that are long haul Class 7 tractors.

Specifically, the VIUS data provided staff with information on (1) the primary range of operation (to determine the percentage of vehicles with a primary range of operation greater than 100 miles), and (2) jurisdiction in which the vehicle was most driven (to determine whether fleets operate interstate or exclusively intrastate). As shown in Table C-4, this information was used by staff to conclude that 23 percent of California's intrastate tractors and 71 percent of California's interstate tractors range of operation to be greater than 100 miles. For out-of-state registered tractors, 69 percent of tractors registered in neighboring states are affected, while 100 percent of non-neighboring states that operate in California are affected. In addition, analysis of VIUS data provided that approximately 5 percent of the total medium-heavy duty diesel vehicles are Class 7 tractors with primary range of operation greater than 100 miles (Census, 2002).

The VIUS database was also used to determine the VMT fraction accrued by tractors with primary range of operation greater than 100 miles, shown in Table C-4. This VMT fraction was applied to the baseline vehicle miles traveled provided by ARB inventory (discussed in A.1 above) to determine the total VMT accrued by the long haul tractors.

Table C-4 • Percentage of Class 7 and 8 Tractors with Primary Range of Operation Greater than 100 Miles and their VMT fraction

Fleet	Percentage of Tractors with Primary Range of Operation > 100 Miles	Percentage of VMT by Tractors with Primary Range of Operation > 100 Miles
CA Intrastate	23%	34%
CA Interstate	71%	80%
Neighboring Out-of-State	69%	84%
Non-neighboring Out-of-State	100%	100%

C. Fraction *at* Long Haul Tractors that Pull 53-Foot or Longer Box-Type Trailers

Staff analyzed trailer production data from the 1997 to 2000 CIR reports (Census, 2000), which showed that the percentage of box-type trailers sold each year from 1988 to 2000 *varied* from 70 to 77 percent with an *overall average* of 73 percent. As shown in Table C-5, staff assumed that this *average* was appropriate for California intrastate, interstate, and neighboring out-of-state fleets operating in California. It was also assumed that since essentially all non-neighboring out-of-state tractors pull loads for greater distances, it would be appropriate to assume that more than 73 percent are box-type. Staff assumed that 90 percent of these tractors pull box-type trailers. The fractions shown in Table C-5 include all box-type trailers of all lengths. To determine the fraction that are 53-foot or longer, staff consulted two trailer manufacturers and ACT Research. The two trailer manufacturers indicated that 90 percent or more of the box-type trailers to be 53-foot or longer. According to ACT Research, 85 to 90 percent of refrigerated *van* and dry *van* trailers are 53-foot or longer (Vieth, 2008). Based on this information, staff assumes that 85 percent of the box-type trailers pulled by California intrastate, interstate, and neighboring out-of-state tractors, and 90 percent of those pulled by non-neighboring out-of-state tractors are 53-foot or longer.

Table C-5 - Percentage *at* 53-Foot Box Type Trailers

Fleet	Percent Box-Type Trailers	Percent that are 53-foot or Longer
CA Intrastate	73	85
CA Interstate	73	85
Neighboring Out-at-State	73	85
Non-neighboring Out-at-State	90	90

Based on the *above* assumptions (Tables C-4 to C-5) and the baseline population and VMT provided by ARB *inventory* (ARB, 2008a), the tractor population impacted by the proposed regulation and the corresponding VMT are calculated and shown in Table C-6 for calendar years 2010 and 2020. '

Table C-6: 2010 and 2020 Impacted Tractor Population and the Corresponding Annual VMT

Fleet	Impacted Tractor Population		Annual VMT (10 ⁶ miles)	
	2010	2020	2010	2020
CA Intrastate	9,547	12,910	705	952
CA Interstate	27,462	37,005	1,320	1,783
Neighboring Out-of-State	18,525	24,962	663	896
Non-neighboring Out-of-State	380,152	507,751	3,187	4,306
Total	435,686	582,628	5,875	7,937

D. Impacted Box-Type Trailer Population

Available data were used to estimate the number of tractors that would be impacted by the proposed rule, as discussed above. For trailers, no database exists that provides a complete inventory on the total number of box-type trailers that would be impacted by the proposed rule. The ratio of trailers-to-tractors in many fleets is often not one-to-one (in which case the same numbers provided in Table C-6 for tractors could have been used to estimate trailer inventory). The ratio varies considerably from fleet to fleet. Many fleets typically own more trailers than tractors in order to maximize efficiency and reduce downtime for the tractor while waiting for the trailer to be loaded and unloaded. The ratio varies from zero for some owner-operators that own only tractors and pull trailers owned by other businesses, to "infinity" for some shippers that own only trailers and use the services of carriers to pull their trailers. Since data describing the tractor-trailer composition of all fleets that operate in California were not available, staff determined an approximate trailer-to-tractor ratio using data from annual CCJ publications (Vise, 2007; Vise, 2008). The published data included the number of trailers and tractors owned by the top 250 carriers in the country in calendar years 2006 and 2007. Analysis of the two annual datasets provided an estimated ratio of 2.5-to-1 trailers to tractors for both years.

The number of box-type trailers impacted by the proposed rule was then estimated by multiplying the trailer-to-tractor ratio of 2.5 by the number of tractors impacted by the proposed rule shown in Table C-6. Table C-7 shows the resulting 53-foot box-type trailer population impacted by staff's proposal for calendar years 2010 and 2020.

Table C-7: 2010 and 2020 Impacted 53-Foot Box-Type Trailers

Fleet	2010	2020
CA Intrastate	23,868	32,275
CA Interstate	68,655	92,513
Neighboring Out-of-State	46,313	62,405
Non-neighboring Out-of-State	950,380	1,269,378
Total	1,089,215	1,456,570

E. Estimated GHG Benefits

The GHGs associated with diesel exhaust are CO₂, methane, and nitrous oxide, with CO₂ being the major component of the three. Since CO₂ is emitted in direct proportion to the fuel combusted, any reduction in CO₂ emissions requires reduction in the fuel burned to propel the vehicle. The proposed regulation would reduce GHG emissions by reducing the fuel consumption of HDVs achieved through improvements in aerodynamic drag and tire rolling resistance. The GHG reductions would contribute towards attaining AB 32 goals for the year 2020.

The following equation was used to calculate the GHG reductions from the proposed regulation.

$$\text{CO}_2\text{e Reduced} = \text{Fuel Savings} * \text{EF} / 1000 \quad (\text{Equation C-1})$$

Where: CO₂e Reduced = average annual reduction in GHGs in metric tons CO₂e
 Fuel Savings = Annual fuel savings in gallons per year
 EF = GHG emission factor from diesel fuel combustion (10.4 kilograms CO₂e per gallon of diesel fuel (ARB, 2008c))
 1000 = Conversion factor from kilograms (kg) to metric tons (1000 kg = 1 MT)

Annual Fuel Savings: The annual fuel savings is determined from the percent fuel efficiency improvement, annual VMT, and the baseline fuel economy, as follows:

$$\text{Fuel Savings (gallons/year)} = \text{Annual VMT} * \% \text{FS} / \text{FE}$$

Where: Annual VMT is the vehicle miles traveled per year
 %FS is the fuel consumption improvement due to improvements in aerodynamic drag and rolling resistance.
 FE is the fuel economy in miles per gallon.

Percent Fuel Efficiency Improvements: The percent fuel efficiency improvements used to quantify the GHG benefits are shown in Table C-8. These were determined

based on the minimum aerodynamic and tire rolling resistance performance requirements specified in the proposed regulation. For example, the proposed regulation would require a minimum fuel efficiency improvement of 3 percent from low-rolling resistance tires on the combined tractor and the trailer, a minimum of 4 percent from trailer side skirts, and a minimum of 1 percent from front or rear gap fairings on dry-van trailers. Thus, for this example, an in-use pre-2011 model year tractor pulling a dry-van trailer would achieve an overall fuel efficiency improvement of 8 percent, as shown in Table C-8.

The fuel efficiency improvements of currently certified aerodynamic devices are determined from track tests conducted at speeds of 60 to 62 miles per hour and utilizing the "SAE J1321 Type II" test procedures. These aerodynamic devices also reduce drag at lower speeds, though to a lesser extent, since aerodynamic drag varies with the square of the vehicle speed.

Annual VMT: The annual VMT applicable to tractors pulling 53-foot or longer box-type trailers was determined using the baseline VMT (ARB, 2008a) and the factors shown in Tables C-3 to C-5. However, the resulting total VMT cannot be directly applied to the fuel efficiency improvements shown in Table C-8, since the VMT is accrued at various speeds, while the fuel efficiency improvements are determined at speeds of approximately 60 miles per hour. Thus, the speed-VMT distribution of the impacted tractors and fuel efficiency improvements at different speeds are needed in order to accurately quantify the GHG emission benefits. However, such data were not available and therefore staff estimated the GHG benefits using only the VMT accrued at highway speeds, without taking into account benefits that occur at lower speeds. Accordingly, for non-neighboring out-of-state tractors, staff assumed 85 percent of the VMT to be at highway speeds, since these tractors travel long distances, spending the majority of their VMT at highway speeds. For neighboring out-of-state, California interstate, and California intrastate tractors, staff assumed 75 percent of the VMT to be at highway speeds, benefiting fully for 75 percent of the VMT from the aerodynamic devices and low rolling resistance tires.

Table C-8: Fuel Efficiency Improvements - Based on Proposed Requirements

	Tractor Improvements	Trailer Improvements ³	Fuel Savings
1	2011 + model year SmartWay certified sleeper cab tractor (3.5%)	Dry-van trailer - SmartWay certified or retrofitted with side skirts and front gap fairings (6.5%)	10.0%
2	2011 + model year SmartWay certified sleeper cab tractor (3.5%)	Refrigerated-van trailer - SmartWay certified or retrofitted with side skirt (5.5%)	9.0%
3	2011 + model year day cab tractors and all pre-2011 model year in-use tractors - Tire Improvements (1.5%)	Dry-van trailer - SmartWay certified or retrofitted with side skirts and front gap fairings (6.5%)	8.0%
4	2011 + model year day cab tractors and all pre-2011 model year in-use tractors - Tire Improvements (1.5%)	Refrigerated-van trailer - SmartWay certified or retrofitted with a side skirt (5.5%)	7.0%

Fuel Economy of On-Road Heavy-Duty Diesel Vehicles in California

ARB staff has recently reviewed multiple data sources to characterize the variations in the fuel economy values of heavy-duty tractors in California, including data from the United States Department of Energy (U.S. DOE, 2007), Coordinating Research Council E55/59 study by West Virginia University (CRC, 2007), the International Fuel Tax Agreement for trucks operating in California, and Consent Decree, in-use study by West Virginia University. The detailed methodology and results are discussed in Appendix G, of the "Staff Report: Initial Statement Of Reasons For Proposed Rulemaking Proposed Regulation For In-Use On-Road Diesel Vehicles" (ARB, 2008a). Results of the analysis, presented in Tables C-9, were used to estimate fuel savings and GHG emission benefits for this proposal.

³ The trailer aerodynamic technologies specified in the table are meant for illustration purposes. Fleets can meet the requirements using other aerodynamic technologies that meet or exceed the minimum performance requirements.

Table e-g - Fuel Economy Values by Model Year

Model Year	Fuel Economy (miles per gallon)	Model Year	Fuel Economy (miles per gallon)
Pre-1988	5.20	2003-2006	5.75
1988-1990	5.39	2007	5.61
1991-1993	5.58	2008	5.59
1994-1995	5.76	2009	5.58
1996	5.95	2010	5.78
1997-1998	5.95	2011	5.78
1999-2002	5.48	2012	5.80

For the purposes of quantifying the emission reductions, staff also assumed that all fleets would adopt the large fleet trailer compliance plan which provides a compliance option for in-use pre-2011 trailers based on a phase-in schedule specified in Appendix F of this report. Staff also assumed that in the absence of the proposed regulation, 20 percent of the tractors sold each year from 2010 to 2020 would be SmartWay certified and 25 percent of the in-use pre-2011 model year tractors would use fuel efficient tires.

The GHG emission benefits were calculated for the years 2010 to 2020 based on VMT accrued within California and nationwide. Table C-10 summarizes the 2010, 2015, and 2020 statewide and nationwide GHG emission benefits of the proposed regulation. Staff estimates that from 2010 to 2020, as new fuel efficient tractors and trailers are introduced and in-use ones retrofitted with fuel efficient technologies, GHG emissions will be reduced by a cumulative total of approximately 8 MMT CO₂e statewide and approximately 52 MMT CO₂e nationwide. The 2020 benefits are approximately 1 MMT CO₂e statewide and 7 MMT CO₂e nationwide. Figure C-1 shows the statewide baseline and controlled GHG emissions for calendar years 2010 to 2020. As seen in Figure C-1, GHG emissions from long-haul tractors continue to increase even with implementation of the proposed regulation because the trucking industry will grow substantially between now and 2020 (ARB, 2008a).

Table C-10: 2010,2015, and 2020 GHG Emission Benefits - Statewide and Nationwide (MMT CO₂e)

Calendar Year	California		Nationwide	
	Baseline	Reductions	Baseline	Reductions
2010	8.5	0.2	55.6	0.9
2015	10.1	0.8	65.7	5.5
2020	11.4	1.0	74.6	6.7

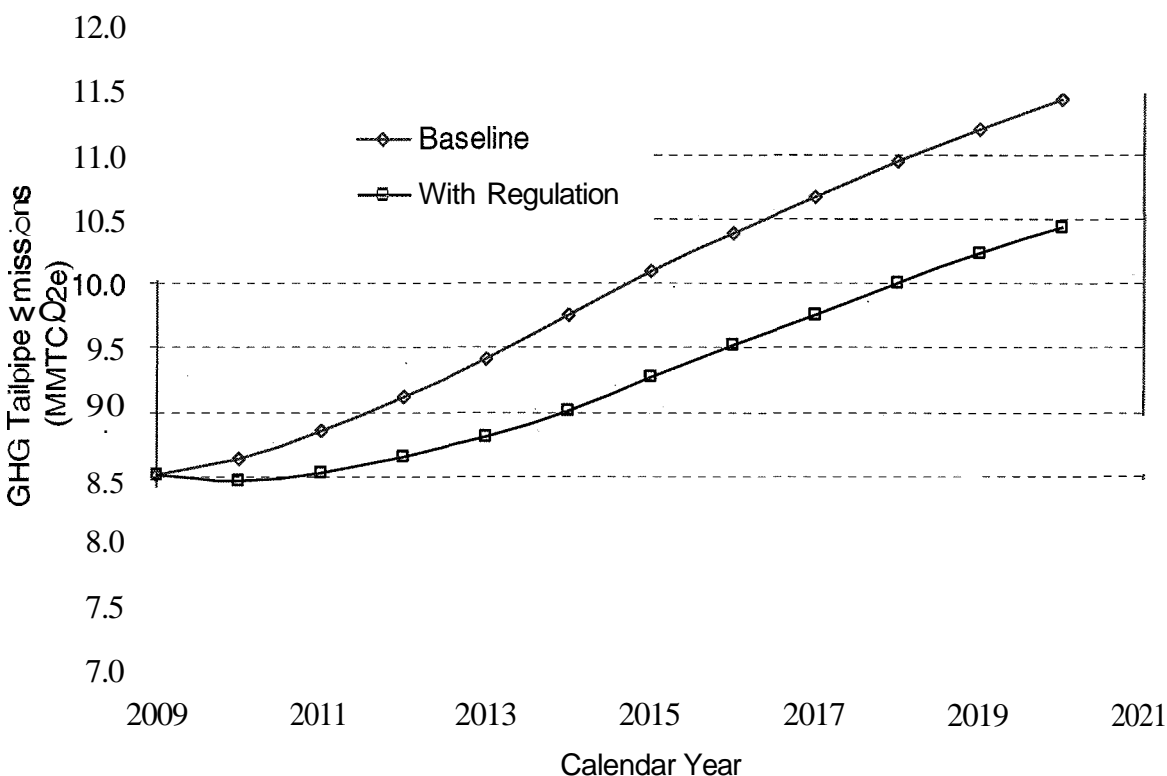


Figure C-1. Statewide GHG Emissions With and Without the Regulation (Long-haul tractor pulling 53-foot box-type trailers)

Estimated Oxides of Nitrogen (NO_x) Emission Benefits

In addition to GHG benefits, reducing aerodynamic drag and rolling resistance also reduces NO_x emissions (Bachman, 2005; Bachman, 2006). Thus, the proposed regulation is expected to provide NO_x emission reduction benefits that would contribute towards attainment of ambient air quality standards for ozone. Staff used the

methodology specified in the U.S. EPA SmartWay State Implementation Plan (SIP) and Transportation Conformity guidance document (U.S. EPA, 2007) to quantify the NOx emission benefits from the proposed regulation.

Because the effects of the SmartWay technologies on NOx emissions of trucks with particulate matter and NOx aftertreatment controls is not yet determined, the U.S. EPA recommends that, for SIP and conformity determinations, the NOx reductions not be applied to trucks of model years newer than 2006. Furthermore, the NOx emission reductions associated with SmartWay retrofit applications vary by speed, requiring the VMT to be distributed by speed. Since speed distribution data for the fleet that is impacted by the proposed regulation were not available, staff made the following assumptions on VMT-speed distribution of long-haul tractors. That is, for non-neighboring out-of-state tractors, staff assumed 85 percent of the VMT to be at highway speeds and a corresponding NOx reduction of 9.5 percent. For the remaining 15 percent of the VMT staff assumed an average speed of 35 miles per hour and a NOx reduction of 4.6 percent. For California intrastate, California interstate, and neighboring out-of-state tractors, staff assumed 75 percent of the VMT to be at highway speeds and a corresponding NOx reduction of 9.5 percent. For the remaining 25 percent of the VMT, staff assumed an average speed of 35 miles per hour and a corresponding NOx reduction of 4.6 percent. Based on these assumptions and U.S. EPA guidelines, California specific NOx reductions were estimated to be 4.3 and 1.4 tons per day in 2014 and 2020 respectively. These reductions assume a "business as usual" scenario, where they do not take into account the impact of other proposed regulations that would impact NOx emissions.

F. References

- ARB, 2006. California Air Resources Board. EMFAC2007. Available at:
http://www.arb.ca.gov/msei/onroad/latest_version.htm Last Accessed: October 22,2008.
- ARB, 2008a. California Air Resources Board. *Staff Report: Initial Statement Of Reasons For Proposed Rulemaking. Proposed Regulation For In-Use On-Road Diesel Vehicles. Appendix G - Emissions Inventory Methodology and Results.* Sacramento: October 2008.
- ARB,2008c. California Air Resources Board. *Climate Change Proposed Scoping Plan. Appendices Volume 1: Analysis and Documentation.* (Appendix II, p.I-6). Sacramento: October 2008.
<http://www.arb.ca.gov/cc/scopingplan/documentlscopingplandocument.htm>
- Bachman, 2005. Bachman, Leon J., Anthony Erb, Cheryl Bynum. *Effect of Single Wide Tires and Trailer Aerodynamics on Fuel Economy and NOx Emissions of Class 8 Line-Haul Tractor-Trailers.* Society of Automotive Engineer 2005-01-3551
<http://www.epa.gov/smartwayltransportldocuments/tech/effects-on-fuel-economy.pdf>
- Bachman, 2006. Bachman, L J., A. Erb, C. Bynum, B. Shoffner, H. De La Fuente, C. Ensfield. *Fuel Economy Improvements and NOx Reduction by Reduction of Parasitic Losses: Effect of Engine Design.* Society of Automotive Engineer, 2006-01-3474. <http://www.epa.gov/smartwayltransportldocuments/tech/fuel-economy--improvements.pdf>
- Census, 2000. Bureau of Census. *Current Industrial Reports, M336L - Truck Trailers.*
<http://www.census.gov/cir/www/336/m3361.html>
- Census, 2002. United States Bureau of Census. *2002 Vehicle Inventory and Use Survey Microdata.* <http://www.census.gov/svsd/www/vius/products.html>
- CRC,2007. Coordinating Research Council, Inc. *Heavy-Duty Vehicle Chassis Dynamometer Testing for Emissions Inventory, Air Quality Modeling, Source Apportionment and Air Toxics Emissions Inventory.* August 2007. Available at:
http://www.crcao.com/reports/recentstudies2007/E-55-59/E-55_59_Final_Report_23AUG2007.pdf
- U.S. DOE, 2008. Department of Energy, Oak Ridge National Laboratory. *Transportation EnergyData Book: Edition 27.* ORNL 6891.
http://www-cta.ornl.gov/data/tedb27/Edition27_Cover.pdf
- U.S. EPA, 2007. U.S. Environmental Protection Agency. *SmartWay SIP and Transportation Conformity Guidance: Accounting for NOx Reductions from Trailer*

Aerodynamic Kits and Low Rolling Resistance Tires. EPA420-B-07-004.
June 2007. www.epa.gov/otag/stateresources/transconf/policY/420b07004.pdf

Vieth, 2008. Vieth, Ken. Telephone Communication with Mr. Ken Vieth, Senior Partner and General Manager of Americas Commercial Transportation Research co., LLC (ACT Research). July 2, 2008

Vise, 2007. Vise, Avery. The CCJ Top 250: Mediocre at Best. *Commercial Carrier Journal*. August 2007. pp. 61-110.
http://www.rrpub.com/etrucker/ccj/ccj0807_250.pdf

Vise, 2008. Vise, Avery. *The CCJ Top 250: Slower But Solid*. *Commercial Carrier Journal*. August 2008. pp. 52-103. http://www.rrpub.com/cci/pdfs/top250_07.pdf

Appendix D:

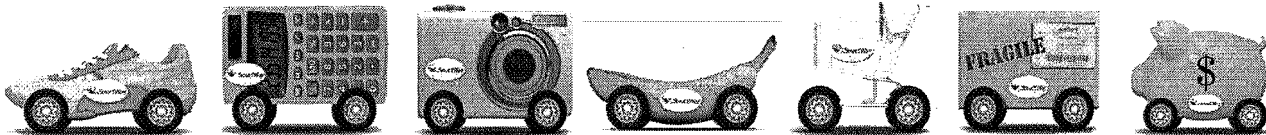
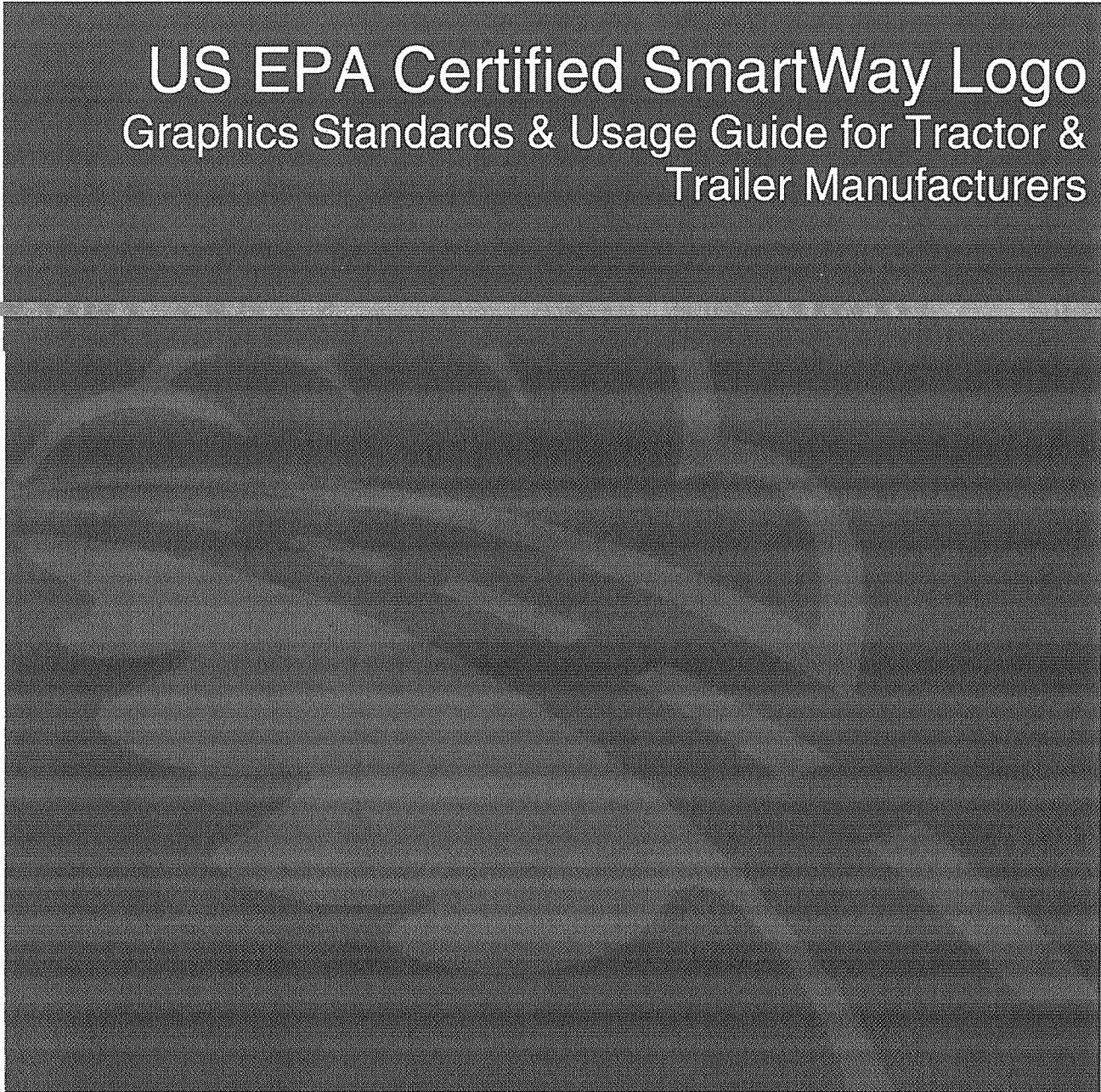
SmartWay Documents

APPENDIX D: SmartWay Documents

- 1) U.S. EPA Certified SmartWay Logo, Graphics Standards & Usage Guide for Tractor & Trailer Manufacturers
- 2) U.S. EPA Certified SmartWay Transport, Technical Specifications and Requirements, 2007 Tractor and 2007 Trailer, EPA420-F-08-015
- 3) U.S. EPA Certified SmartWay Transport Partnership, Partnership Agreement: Carriers
- 4) U.S. EPA Certified SmartWay Transport Partnership, Join the SmartWay Transport Partnership TODAY!
- 5) U.S. EPA Certified SmartWay Transport Partnership, Overview of Carrier Strategies
- 6) U.S. EPA Certified SmartWay Transport Partnership, Partnership Agreement Logistics
- 7) U.S. EPA Certified SmartWay Transport Partnership, Overview of Shipper Strategies
- 8) U.S. EPA Certified SmartWay Transport Partnership, Partnership Agreement: Shippers
- 9) U.S. EPA Certified SmartWay Transport Partnership, SmartWay Transport Partners and Affiliates, <http://www.epa.gov/smartway/transport/partner-list/index.htm>, Last updated on Wednesday, October 5^m, 2008
- 10) U.S. EPA Certified SmartWay Transport Partnership, Partner Resources: Frequently Asked Questions, <http://www.epa.gov/smartway/transport/partner-resources/resources-faq.htm>, Last updated on Tuesday, August 19^m, 2008
- 11) U.S. EPA Certified SmartWay Transport Partnership, SmartWay Transport FAQs
- 12) U.S. EPA Certified SmartWay Transport Partnership, Smartway Transport Overview



US EPA Certified SmartWay Logo Graphics Standards & Usage Guide for Tractor & Trailer Manufacturers



Technical Specifications & Requirements

Using the US EPA Certified SmartWay® Mark
on Qualifying Tractors and Trailers

US EPA Certified SmartWay Mark Specifications

Tractors and Trailers equipped as described in the following tables meet the voluntary SmartWay technical specifications for use of the US EPA Certified SmartWay mark.

Equipment list for US EPA Certified SmartWay Tractors:

Base Tractor	<ul style="list-style-type: none"> • A SmartWay Tractor has a high roof sleeper cab and an aerodynamic tractor design with full aerodynamic package. • Current tractor models that qualify include: <ul style="list-style-type: none"> ○ International Prostar and 9200i ○ Mack Pinnacle ○ Freightliner Columbia and Century Class <i>SIT</i> ○ Volvo VN series ○ Kenworth T2000 and T660 ○ Peterbilt 387 and 386
Full Aerodynamic Tractor package	<p>Models equipped with all of the aerodynamic equipment listed below:</p> <ul style="list-style-type: none"> • Aero Profile Tractor • Integrated Cab Roof Fairing • Aero Mirrors and Bumpers • Cab Extenders • Fuel Tank Side Fairings
NOx/PM Specifications	2007 model year engines
Tire specifications	Low-rolling resistance tires that provide a 3% fuel economy benefit, relative to mid-range rolling resistance tires.
Idling Control Readiness	<p>Models must offer one of the following options that allow elimination of overnight idling by the main engine:</p> <ul style="list-style-type: none"> • Generator sets • Auxiliary power units • Direct fired heaters • Battery powered HVAC systems • Automatic engine start/stop systems

Equipment list for US EPA Certified SmartWay Trailers:

Base Trailer	A dry van trailer of 53' length
Weight Specifications	Lightweight trailer option with weight saving technologies
Aerodynamic Trailer Package	<ul style="list-style-type: none">• Trailer side fairings• Trailer front mounted gap fairings <p>- or -</p> <ul style="list-style-type: none">• Trailer rear mounted fairings or boat tails
Tire specifications	Low-rolling resistance tires (duals or singles) that provide a 3% fuel economy benefit, relative to mid-range rolling resistance tires.

Graphic Standards and Logo Usage Guidelines

US EPA Certified SmartWay® Mark for Qualifying Tractors and Trailers

Promoting the **Mark**

The US EPA Certified SmartWay mark may be used in point-of-sale advertising (for on-site locations and web sites) and promotional material of original equipment manufacturers (OEM) of SmartWay qualified tractors and trailers. Media and other interested parties may also use the SmartWay mark for articles or other educational purposes. However, the mark may only be used in association with tractors and trailers that have met the SmartWay technical specifications.

Only tractor and trailer manufacturers may use the SmartWay mark. Component manufacturers (such as tire or aerodynamic add-on manufacturers) may not apply the US EPA Certified SmartWay mark to their products, product packaging, on their sales web sites or in their point-of-sale advertising.

The US EPA Certified SmartWay mark may also be applied, by the original equipment manufacturer (OEM), to the interior of a qualified SmartWay tractor or a SmartWay trailer. However, it may not be applied to the windows of a tractor or in any place on a tractor's interior that is visible from the exterior.

Correct

Point of sale advertising (signs, banners)
Cab door interior
Cab dash
OEM sales web site

Incorrect

Cab window
Cab rear-view mirror
Cab windshield

The following communication guidelines will prevent misrepresentation and consumer confusion.

Correct

"Earned"
"Qualified"
"Meets SmartWay specifications"

Incorrect

"Endorse"
"Rating"
"Rated"

EPA recommends using words in the "correct" column to describe tractors and trailers which meet the voluntary requirements for application of the SmartWay logo by OEMs. Text used in advertising, articles, brochures, publications, annual reports, web sites, or any other promotional material must never imply EPA endorsement of either the manufacturing company or sponsoring organization.

Graphics



The US EPA Certified SmartWay mark must be used its entirety and as shown. The only approved logo files to be used can be obtained by contacting EPA. No other graphical representation of the mark may be used.

The graphic may not be altered, cut apart, separated, or otherwise distorted in perspective or appearance. The aspect ratio (length and width dimensions) must remain proportional. The logo must never be reproduced smaller than 1.25" wide to ensure legibility.

Licensees, SmartWay Partners and other organizations are responsible for their own use of the US EPA Certified SmartWay mark, as well as use by their representatives, such as ad agencies and public relations firms.

Color Specifications

1. Spot Color - For spot color usage (often referred to as PMS or Pantone Matching System):
 - Prescribed green = 347
 - Prescribed blue = 3005
2. Four-Color Process - For four-color process printing, the build formulas detailed here for the prescribed green and blue must be used.

PRESCRIBED GREEN

Four-Color Process

C	100%
M	0%
Y	85%
K	5%

PRESCRIBED BLUE

Four-Color Process

C	100%
M	40%
Y	0%
K	0%

3. Black and White Version - The graphics in their entirety may also be reproduced in 100% black.



Technical Specifications & Requirements 2007 Tractor & 2007 Trailer

EPA420-F-08-015

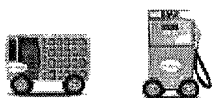
EPA's SmartWaySM Transport Partnership is an innovative program that recognizes Partners for setting and achieving greenhouse gas (GHG) reduction goals in freight transport.

SmartWay equipment specifications can reduce fuel consumption by 10 (to 20 percent for 2007 long-haul truck and tractor models). SmartWay Partners that purchase these new truck and trailer models can use the SmartWay Tractor and Trailer marks.

SmartWay 2007 Tractor

SmartWay Transport Partners in good standing may affix the SmartWay 2007 Tractor mark to the exterior of vehicles equipped to meet all the technical specifications described in the following table.

	SmartWay Tractor Equipment List	Maintenance or Operational Requirements
Base Tractor	<ul style="list-style-type: none"> • Current high roof sleeper cab tractor models that qualify include: <ul style="list-style-type: none"> o International Prostar and 9200i o Mack Pinnacle o Freightliner Columbia and Century Class S/T, and Cascadia o Volvo VN series o Kenworth T2000 and T660 o Peterbilt 387 and 386 <p>Consult your truck dealership for the most updated list of SmartWay-certified base aerodynamic models.</p>	Maintain per manufacturer's service recommendations.
Aerodynamic Features	<p>A SmartWay-certified base aerodynamic tractor model is equipped with:</p> <ul style="list-style-type: none"> • Integrated sleeper cab roof fairing • Aerodynamic mirrors • Aerodynamic bumper • Cab side extenders • Fuel tank fairings 	<p>Maintain per manufacturer's recommendations.</p> <p>Replace if necessary.</p>
Engine Specifications	<p>A 2007 or later model year engine certified to U.S. EPA NOx/PM emission requirements.</p>	Maintain per manufacturer's service recommendations.



SmartWay Tractor Equipment List

Low-rolling resistance tires (bias, or singles, aluminum wheels optional) that provide a 3% fuel economy benefit, relative to mid-range rolling resistance tires as defined by EPA. Approximately half the fuel savings, or about 1 1/2 percent, is contributed by the tractor steer and drive tires. Current qualifying tire models include:

	Goodyear	
R280	Steer: G590 LHS Fuel Max	
Genesee	Drive: G506 LHO Fuel Max	
	Michelin	
	Steer: XZAS, XZAS2	
Plus	Drive: XDA Energy, XDA3, X-One XDA	

Additional tire models may be added in the future.

Maintenance or Operational Requirements

- Commitment to replace the tires with low rolling resistance tractor tire models or retreads
- Maintain tires at manufacturer-recommended load and inflation pressures

SmartWay truck centers must employ at least one no-tide option capable of providing at least eight hours of tide-free auxiliary power, heat, and/or air conditioning. To ensure that the truck does not idle overnight on a year-round basis, a combination of tide reduction options may be needed. Each system must have at least eight hours of operating capacity. Tide reduction technologies include the following:

- An idle shutdown system that relies upon a battery
- An auxiliary power unit (APU)
- A combination tank heating/cooking system

- Curtains (or SmartWay Parkins) can either:
 - select from the preceding list of tide reduction options available from the truck manufacturer;
 - Purchase and install aftermarket tide reduction equipment within one month of tractor purchase
- opt to employ a documented, on-going and consistent (year-round) no-idling policy or:
 - Using double drivers or providing overnight hotel stays for drivers
 - Using shore power truck stop electrification

Trailers equipped as described in the following tables meet the voluntary SmartWay technical specifications for use of the US EPA Certified SmartWay mark.

A SmartWay Trailer demonstration 0.5% or greater reduction in fuel consumption, relative to a baseline trailer. See below for baseline trailer description. SmartWay Trailer fuel savings assume a trailer is used with a fully-aerodynamic profile, high-roof tractor with integrated roof fairing and side fairings.

SmartWay Trailer fuel savings can be achieved by:

1. Aerodynamic improvements - 5% or greater fuel savings from reducing aerodynamic drag.
2. Low rolling resistance tires with aluminum wheels - 1.5% or greater fuel savings from reducing tire rolling resistance and lower weight. Note: Total vehicle fuel savings of 3% or greater, achieved by using low rolling resistance tires on both the tractor and trailer.
3. Aluminum wheels and/or weight reduction – Optional. For each 300 pounds reduced, 0.2% or greater fuel savings are realized (or if weight-limited, payload capacity can be increased.)¹

¹ For new trailers, weight savings can be achieved by using aluminum wheels and/or other light-weighting in the trailer. " [Page 2]

To demonstrate a trailer is a SmartWay Trailer:

1. Install SmartWay-specified aerodynamic equipment and tire models (details below). It is optional to provide weight reductions, relative to the base trailer.
or,
2. Conduct a TMC/SAE Fuel Consumption Test Procedure – Type II, SAE Surface Vehicle Recommended Practice J1321. Manufacturers must certify results in writing to EPA, and must share all test information and test results with EPA upon request. Test design, vehicles, payload, drive cycles, etc., must be consistent with EPA determination of typical vehicle operation and consistent with EPA policy guidance.

	SmartWay Trailer Equipment List	Maintenance or Operational Requirements
<p>Base Trailer</p>	<ul style="list-style-type: none"> • Design: A SmartWay Trailer is a new dry freight box van trailer for OTR use of 53 feet or greater length. Additional trailer types may be added in the future. • Dimensions: 13' 5" to 13' 7" H, 53' L or greater, 102" outside W • Weight: Assumes a standard dry van trailer of approximately 13,000 pounds or less, including weight of tires and wheels, but excluding weight of aerodynamic components • The following trailer manufacturers offers a qualifying model: <ul style="list-style-type: none"> - Great Dane - Hyundai Translead - Trailmobile - Utility - Wabash • Additional models may be added in the future by these^c and other trailer manufacturers: <ul style="list-style-type: none"> - Manac - Stoughton - Strick • An older trailer of 53 feet or greater length may also qualify if properly retrofitted. 	<p>Maintain per manufacturer's service recommendations.</p>
<p>Aerodynamic Features Side Skirt Fairings</p>	<ol style="list-style-type: none"> A. Designed to smooth air flow and reduce cross-flow along and below the side edges of the trailer. B. Meets the following design specifications: <ul style="list-style-type: none"> • Fits flush along each bottom side edge of a trailer, with less than a 0.5" gap between the top edge of the fairing and the bottom side edges of the trailer. • Covers 70% or more of the distance of the trailer length between the center point of the front trailer axle and the landing gear, measured when the tandem is in the forward-most position. • Covers 68% or more of the distance of the gap between the bottom edge of the trailer and the ground, measured at the midpoint between the center of the front trailer axle and the landing gear, when the upper coupler/5th wheel is set at 43°. • Constructed of rigid or semi-rigid material, although it can have a flexible bottom strip. • Resists impact damage and is lightweight (e.g., aluminum, thermo-plastic, Fiberglass). • Designed for permanent installation. • Does not interfere with visibility of lights or with the operation of brakes, landing gear, and other trailer functions. C. Demonstrate at least a 4% fuel savings, as measured by SAE J1321 fuel consumption test. 	<p>Maintain per manufacturer's service recommendations.</p> <p>Replace if necessary.</p>

SmartWay Trailer Equipment List

Maintenance or Operational Requirements

At least one of the following additional fairings:

Maintain per manufacturer's service recommendations.

Front Trailer Fairing

Replace if necessary.

A. Designed to smooth air flow around exposed top and side edges of the front of the trailer and reduce tractor-trailer gap.

B. Meets the following design specifications:

- A three-panel design that fits flush along the top and along each side edge of the front side of the trailer, such that corners are flush with the face of the trailer and can be sealed to a maximum of 0.5" to either the hells or outside of the corner edge of the top and along each side edge of the face of the trailer.
- The top panel covers 80% or greater of the distance of the trailer front body width when measured along the top trailer edge, between the two side posts of the trailer's front axle.
- Each side panel covers 75% or more of the distance of the trailer front body height when measured along each side edge, between the top and bottom of the front side of the trailer. This is so the hook-ups can remain exposed.
- Reduces tractor-trailer gap and does not interfere with the turning swing radius of the trailer, consistent with DOT rules.
- Constructed of rigid or semi-rigid material.
- Resists impact damage and is lightweight (e.g., aluminum, composite, fiberglass).
- If a three-panel design, the panels curve inward slightly.
- Designed for permanent installation.

C. Demonstrates at least a 1% fuel savings, as measured by SAE J1321 fuel consumption test.

Rear Trailer Airing (Coast Veil)

Maintain per manufacturer's recommendations.

Replace if necessary.

A. Designed to reduce air pressure drop and turbulence at the rear of the trailer.

B. Meets the following design specifications:

- A three-panel or a "bubble" design, with pressure-tight corners that can be sealed to a maximum of 0.5" to either the hells or outside of the corner edge of the top and along each side edge of the rear side of the trailer. Can be door- or post-mounted.
- The top panel (or the top edge of the bubble design) covers 80% or more of the distance of the trailer rear body width when measured along the top trailer edge, between the two side posts of the trailer's rear axle.
- Each side panel (or each side of the bubble design) covers 80% or more of the distance of the trailer rear body height when measured along each side edge, between the top and bottom of the rear side of the trailer.
- Extends outward by at least 24 inches when measured from the back side of the trailer to either: a) the leading edge of the top panel in a three-panel design; or, b) the center in a bubble design.
- Constructed of rigid or semi-rigid material. If a three-panel design, if a bubble design, constructed of durable material that maintains its shape and, if inflatable, its air pressure.

| Page 4 |

Rear-mounted trailer fairing

Front-mounted trailer gap fairing

	SmartWay Trailer Equipment List	Maintenance or Operational Requirements
	<ul style="list-style-type: none"> • Resists impact damage and is lightweight (e.g., for three-panel designs, aluminum, thermo-plastic, Fiberglass.) • Designed for permanent installation. • If a three-panel design, the panels angle inward slightly. • Does not interfere with NHTSA visibility requirements for three way lights or conspicuity. This may require lights and/or reflective tape integrated into the fairing design • Folds back against the trailer sides or otherwise is readily compacted, it does not interfere with the normal functioning of the trailer doors. <p>or</p> <p>D. Demonstrate at least at least a 1% fuel savings, as measured by SAE J1321 fuel consumption test.</p>	
Trailer Tire Specifications	<p>Low-rolling resistance tires (duals or singles, aluminum wheels optional) that provide a 3% vehicle fuel economy benefit, relative to mid-range rolling resistance tires as defined by EPA. Approximately half the fuel savings, or about 1 ½ percent, is contributed by the trailer tires. Current qualifying trailer tire models include:</p> <p>Bridgestone Trailer: R195, Greatec</p> <p>Continental Trailer: HTL</p> <p>Goodyear Trailer: G316 LHT Fuel Max</p> <p>Michelin Trailer: XTA Energy, XT1, X-One XTA</p> <p>Additional tire models may be added in the future.</p>	<p>Commitment to replace the tires with low rolling resistance trailer tire models or retreads</p> <p>Maintain tires at manufacturer-recommended load and inflation pressures</p>

Confirming SmartWay Mark Status

SmartWay Partners can confirm that their new tractors and new or retrofitted trailers qualify to use the SmartWay Tractor and Trailer marks by consulting their assigned U.S. EPA SmartWay Partner Account Manager.



Qualifying manufacturer tractors and trailers may be identified by the US EPA Certified SmartWay mark adhered to the interior of the equipment.

SmartWay Partners must document that qualifying tractors and trailers are part of the company's fleet. To do so, EPA requests that Partners submit the attached SmartWay Tractor & Trailer equipment checklist. A completed equipment checklist may be faxed to the SmartWay Partner Account Manager at (734) 214-4052.

For questions and Partner support, please call your SmartWay Partner Account Manager, or the SmartWay Transport Partnership call center at 734-214-4767.



Equipment Checklist

SmartWay Partner: _____
 Company or Organization Name

Checklist for SmartWay 2007 Tractor and Trailer Equipment (see pages 1-5)

Equipment	Quantity	<input checked="" type="checkbox"/>	Documentation to Submit to SmartWay Partner Account Manager
Sleeper cab w/high roof fairing	_____	<input type="checkbox"/>	Manufacturer, Model and Year
Cab side extenders	_____	<input type="checkbox"/>	Manufacturer & Model
Integrated sleeper cab roof fairing	_____	<input type="checkbox"/>	Manufacturer & Model
Aero Mirror	_____	<input type="checkbox"/>	Manufacturer & Model
Aero Bumper	_____	<input type="checkbox"/>	Manufacturer & Model
Fuel tank fairing	_____	<input type="checkbox"/>	Manufacturer & Model
2007 or later model year engine	_____	<input type="checkbox"/>	Manufacturer, Model and Year
Tractor steer tires	_____	<input type="checkbox"/>	Manufacturer & Model
Tractor drive tires	_____	<input type="checkbox"/>	Manufacturer & Model
Tractor aluminum wheels (optional)	_____	<input type="checkbox"/>	Manufacturer & Model
Battery operated idle start/stop system	_____	<input type="checkbox"/>	Manufacturer & Model
APU	_____	<input type="checkbox"/>	Manufacturer & Model
Bunk heating/cooling unit	_____	<input type="checkbox"/>	Manufacturer & Model
Idling control strategy	_____	<input type="checkbox"/>	Double Drivers
Idling control strategy	_____	<input type="checkbox"/>	Driver overnight
Idling Control strategy	_____	<input type="checkbox"/>	hotel stay
Idling control strategy	_____	<input type="checkbox"/>	Truck Stop
Idling control strategy	_____	<input type="checkbox"/>	shore power
Idling control strategy	_____	<input type="checkbox"/>	Truck Stop
Idling control strategy	_____	<input type="checkbox"/>	electrification
53 foot trailer	_____	<input type="checkbox"/>	Manufacturer & Model
Aerodynamic trailer side skirt fairings	_____	<input type="checkbox"/>	Manufacturer & Model
Front-mounted trailer gap fairings	_____	<input type="checkbox"/>	Manufacturer & Model
Rear-mounted trailer tail fairings	_____	<input type="checkbox"/>	Manufacturer & Model
Trailer aluminum wheels (optional)	_____	<input type="checkbox"/>	Manufacturer & Model
Trailer tires	_____	<input type="checkbox"/>	Manufacturer & Model

Note: Indicate only one tractor manufacturer, model and model year per page. Use multiple pages if appropriate.

SmartWay Transport • www.epa.gov/smartway • 734-214-4767 • smartway_transport@epa.gov



Partnership Agreement: Carriers

EPA's SmartWaySM Transport Partnership is an innovative program that recognizes Partners for setting and achieving greenhouse gas (GHG) reduction goals in freight transport.

With this agreement, _____, joins EPA's SmartWay Transport Partnership and commits to:

Measure the environmental performance of our fleet using EPA's FLEET Performance Model - Carrier Module (results attached).
Identify a goal to improve the environmental performance of our fleet, to be achieved within 3 years of signing this agreement.
Develop an Action Plan detailing how the goal will be achieved.
Submit the goal and Action Plan to EPA within 6 months of signing and submitting this agreement.
Report progress toward achieving the goal to EPA annually.

In return, EPA commits to:

Increase public awareness of Partner participation in the SmartWay Transport Partnership by listing Partners on the EPA SmartWay Transport Partnership Website and in related educational, promotional, and media materials. EPA will obtain express written consent from the Partner before publishing the Partner's name other than in the context of increasing public awareness of its participation as described here.
Publicize the actual performance data of Partners only with a Partner's express permission, except as otherwise required by law.
Assist Partners in achieving goals by working to address challenges, create incentives, and provide technical assistance and support (subject to appropriations).

General terms:

If the Partner or EPA defaults upon this agreement at any point, the agreement shall be considered null and void. Either party can terminate the agreement at any time without prior notification or penalties or any further obligation. EPA agrees not to comment publicly regarding the withdrawal of Partners. EPA reserves the right to suspend or revoke Partner status for any Partner that fails to accomplish the specific actions to which it committed in the SmartWay Transport Partnership Agreement and subsequent Agreements. The Partner agrees that it will not claim or imply that its participation in the SmartWay Transport Partnership constitutes EPA approval or endorsement of anything other than the Partner's commitment to the program. The Partner will not make statements or imply that EPA endorses the purchase or sale of the Partner's products and services or the views of the organization. The Partner understands that it bears its own costs for participation in this program, and agrees not to submit a claim for compensation to EPA or any other Federal agency on the basis of this agreement.

Authorized Partner Official:

The undersigned, on behalf of _____ understands and agrees to the terms of the EPA SmartWay Transport Partnership.

SIGNATURE OF VICE PRESIDENT OR EQUIVALENT	TITLE
PRINT NAME	DATE
CITY	ZIP
	PHONE

Designated Partner Representative:

NAME	TITLE
ADDRESS	ZIP
E-MAIL	PHONE



Join SmartWay
Transport Partnership **TODAY!**

Becoming a SmartWay Transport Carrier Makes Good Business

Cost Savings:

The Partnership promotes new technologies and management practices to save fuel, which saves you money, period.

Business-to-Business Advantage:

SmartWay Transport Carriers are preferred by SmartWay Transport Shippers, and they want to ship their goods with you. Shipper Partners are already giving priority contracts to SmartWay Transport Carriers.

Freight Management Tools:

EPA's FLEET Performance Model allows you to track and manage fuel use, evaluate fuel savings and environmental benefits of a variety of fuel efficiency strategies, and create a custom-fit plan for achieving greater fuel efficiency gains in the future.

Technical Support:

EPA will assist you in using the FLEET Performance Model and meeting your goals.

Recognition for Your Existing Environmental Improvements:

Your fleet's existing fuel efficiency strategies, coupled with continued improvements, determine your status in the Partnership. You get full credit for improvements made thus far.

Promotional opportunities and public recognition:

The SmartWay Transport Partner brand of excellence is awarded to qualifying Partners as a visible cue to your business customers, clients, and consumers to use in their advertising and other promotional media. It tells them that you are a champion of environmental stewardship and helps them to make educated choices about SmartWay Transport(ed) products. Visible exposure through national and regional events, advertisements, articles, and special recognition are just a few ways that EPA commits to recognize your achievements.

"...I encourage everyone to join Swift in becoming a member of SmartWay. You'll save fuel which means you'll make more money."

— Dave Berry, Vice President,
Swift Transportation

"Like others in the transportation industry we need the ability to operate efficiently and ensure that we reduce the impact our company has on the environment. By becoming a member of SmartWay, our company, as a whole, is challenged to improve our operations for the betterment of all."

— Joe Chapman, Operations Manager,
Triple S Trucking

Becoming a Partner is Easy

When you join the SmartWay Transport Partnership, you commit to:

Assess your fleet's environmental performance using EPA's FLEET Performance Model for Carriers;
Identify a goal to improve your environmental performance;
Develop a plan detailing how the goal will be achieved; and
Report your progress annually to EPA.

Simply mail or fax the signed Partnership Agreement to:

SmartWay Transport Partnership
U.S. EPA Office of Transportation and Air Quality
2000 Traverwood
Ann Arbor, MI 48105
Fax: (734) 214-4052

Then download the FLEET Performance Model at www.epa.gov/smartway, fill in your fleet information, and email the completed model to smartway_transport@epa.gov. Your Partner Welcome Kit will be mailed to you shortly.

Become a SmartWay Transport Carrier TODAY!

For more information about joining the SmartWay Transport Partnership, call us at (734) 214-4767.

♻️ Recycled ♻️ Recyclable. Printed with Vegetable Oil-based inks on Recycled Paper. Minimum 25 Postconsumer Waste Recycled Content.

U.S. Environmental Protection Agency • Office of Transportation and Air Quality • 2000 Traverwood, Ann Arbor, MI 48105 • 734-214-4767 • fax 734-214-4052 • www.epa.gov/smartway



Overview of Carrier Strategies

Truck and rail transport provides a cost-effective means to transport much of America's ground freight more safely. There are simple actions that can be taken to make the carrier for the environment. The following technologies and practices can help truck carriers save fuel and money, reduce air pollution, and cut carbon dioxide emissions that contribute to climate change.

Idle Reduction

An idling truck burns nearly one gallon of diesel fuel per hour. Reducing unnecessary idling could save each truck over \$3,000 in fuel costs, reduce air pollution, and cut 19 metric tons of carbon dioxide annually.

On-board idle reduction systems include auxiliary power units that provide electricity to the cab, direct-fired heaters and coolant systems that provide temperature control, and programmable automatic engine shut-off systems. Truck plazas equipped with truck stop electrification systems allow trucks to draw electrical power and in some cases heating, cooling, telecommunication, and Internet hookups from a ground source.

Improved Aerodynamics

Reducing the aerodynamic drag of a typical line-haul truck by 15 percent could cut annual fuel use more than 2,000 gallons, save over \$3,500 in fuel costs, and eliminate 20 metric tons of carbon dioxide.

Tractor aerodynamics can be improved by adding integrated roof fairings, cab extenders, side fairings, and aerodynamic bumpers. New truck buyers can purchase aerodynamic models with streamlined profiles. Trailer aerodynamics can be improved by minimizing tractor-trailer gap, adding side skirts and rear air fairings, and arranging cargo and tarpaulins as low, taut and smooth as possible. Single-unit trucks can be improved with air deflector bubbles or by purchasing new streamlined models.

Improved Freight Logistics

Improved logistics can reduce the miles that a truck drives empty. Eliminating 15 percent of a line-haul truck's empty miles could save \$3,000 in fuel and reduce 24 metric tons of carbon dioxide annually.

Improved logistics include load matching, more efficient routes and delivery schedules, and improved shipping and receiving practices. A carrier may employ low-cost options like triangular routing, coordinating loads with other fleets, and checking electronic load boards, or the carrier may purchase freight broker services and logistics software.

Automatic Tire Inflation Systems

Retrofitting a line-haul truck with an automatic tire inflation system could save 100 gallons of fuel annually and reduce tire wear and maintenance, while eliminating one metric ton of carbon dioxide.

Truck fleets that find it too difficult or expensive to monitor tire pressure on a regular basis should consider installing automatic tire inflation (ATI) systems on drive and trailer tires. An ATI system used on a typical line-haul truck can generally pay for itself in just over two years, while decreasing the risk of expensive tire failure caused by under inflation.

Wide-base Tires

Specifying single wide-base tires on a new combination truck could save \$1,000 immediately and reap annual fuel savings of 2 percent or more while cutting carbon dioxide by more than four metric tons.

Single wide-base tires save fuel by reducing vehicle weight, rolling resistance and aerodynamic drag. These tires can also improve tank trailer stability by allowing the tank to be mounted lower. There are several single wide-base tire models from which to choose, plus these tires can be retreaded.

Even highly experienced drivers can boost their skills with training aimed at raising fuel economy by 5 percent or more, which would save \$1,200 in annual fuel costs and cut eight metric tons of carbon dioxide.

Effective driver training programs can improve fuel economy by 5 percent or higher. Some fleets report fuel economy gains of up to 20 percent. Among other techniques, drivers learn progressive shifting, engine speed optimization, idle reduction, smoother braking and acceleration, anticipatory driving, speed control, and optimal gearing.

Low-Viscosity Lubricants

When used in a line-haul truck, synthetic engine and drive train lubricants can improve fuel economy by up to 3 percent, saving as much as 500 gallons of fuel and cutting up to five metric tons of carbon dioxide annually.

- Low-viscosity synthetic or semi-synthetic lubricants flow more easily and withstand the extreme pressure of engine, transmission, and drive train systems better than conventional mineral oil blends.

The operator of a typical line-haul truck can save up to \$500 annually by switching to low viscosity lubricants, with additional savings possible due to reduced wear and maintenance of truck systems.

Intermodal Shipping

Intermodal freight transport combines the best attributes of both truck and rail shipping. Over long distances using intermodal can cut fuel and carbon dioxide by 65 percent, compared to truck-only moves.

Carriers can maximize resources by using freight trains to handle the long-distance portion of a freight move, especially for less time-sensitive cargo that is shipped over 500 miles.

Intermodal options include trailer on flat car (TOFC), container on flat car (COFC), double stack service, rail bogeys and dual-mode trailers, and rail platforms that can accommodate standard trailers.

Combination Vehicles

A freight truck using longer or multiple trailers can haul more cargo than a standard combination truck, potentially saving up to \$5,000 in fuel costs and 34 tons of carbon dioxide on a ton-mile basis annually.

Common longer combination vehicle (LCV) configurations include the Rocky Mountain Double, Turnpike Double, Triples, and Eight-Axle Twin Trailers.

A motor carrier operating in states that permit LCVs can reduce the number of trips required to haul a given amount of freight—saving time, money, and emissions.

Reducing Highway Speed

A line-haul truck, with 90 percent highway miles that reduces its top speed from 70 to 65 miles per hour could cut its annual fuel bill nearly \$1,500 while eliminating almost 10 metric tons of carbon dioxide.

Reducing highway speed also reduces engine and brake wear, which cuts down the cost and frequency of maintenance service, and keeps revenue earning equipment on the road longer.

Any truck carrier can adopt a speed management policy at little or no cost. The most successful speed reduction policies combine electronic engine controls with driver training and incentives.

Weight Reduction

Reducing 3,000 pounds from a line-haul truck by using lighter-weight components could save up to 300 gallons of fuel annually and eliminate up to three metric tons of carbon dioxide.

Aluminum alloy wheels, axle hubs, clutch housings, and cab frame can trim hundreds of pounds from a truck tractor. Downsizing to a smaller engine can also provide significant weight savings. Thousands of pounds can be reduced from a truck trailer using aluminum roof posts, floor joists, upright posts, and hubs and wheels.

Hybrid Powertrain Technology

Hybrid vehicles can provide roughly \$2,000 in fuel savings and cut carbon dioxide by up to 12 metric tons per year when used in stop-and-go freight applications like parcel delivery service.

Hybrid vehicles have two propulsion power sources, making it possible to capture energy otherwise lost during braking and provide boost to the main engine which in turn can run more efficiently. Most hybrid vehicles use an internal combustion engine for the main power source with various secondary power and energy storage configurations, including electric and hydraulic systems.

Renewable Fuels

In addition to benefiting the environment and helping reduce U.S. dependence on foreign oil, using biodiesel can provide more lubricity which may help extend a vehicle's engine life. Most diesel engines can run on biodiesel without needing any special equipment, and when running on biodiesel will have similar horsepower and torque as conventional diesel.*

Biodiesel provides significant reductions in greenhouse gas (GHG) emissions - B100 reduces lifecycle GHG emissions by more than 50 percent, while B20 reduces emissions by at least 10 percent.

Biodiesel also reduces emissions of carbon monoxide, particulate matter, sulfates, hydrocarbons and air toxics.

Biodiesel produced from crops grown in the U.S. can help America's family farmers while bolstering America's energy security.

* Always check with your engine manufacturer before switching to biodiesel, and look for biodiesel that meets applicable ASTM and BQ9000 requirements.



Partnership Agreement: Logistics

EPA's SmartWay Transport Partnership is a voluntary program that recognizes Partners for setting and achieving greenhouse gas (GHG) reduction goals in freight transport.

With this agreement, _____, joins EPA's SmartWay Partnership and commits to:

- Determine the percentage of freight shipped by SmartWay carriers.
- Increase the percentage of freight shipped by SmartWay carriers by at least 10% per year, or increase the number of SmartWay carriers contracted by 50 companies per year, and report this information in the EPA's FLEET Performance Model.
- Develop a three-year action plan detailing how this goal will be achieved.
- Submit the goal and action plan to EPA within 6 months of signing and submitting this agreement.
- Report progress toward achieving this goal to EPA annually.
- Provide a link to the SmartWay Transport Partnership website on the company website.
- Inform contracted carriers about the Partnership and the benefits of participating in the Partnership through various means, such as: including SmartWay membership in contracting criteria, mailing brochures and pamphlets, and giving presentations at meetings.

In return, EPA commits to:

- Increase public awareness of Partner participation in the SmartWay Transport Partnership by listing Partners on the EPA SmartWay Transport Partnership website and in related educational, promotional and media materials.
- Obtain express written consent from a Partner before publishing the Partner's name in any context or for any purpose other than those stipulated above.
- Provide Logistic companies with the needed information to quantify emissions from their freight facility operations, and to determine the percentage of freight shipped with SmartWay Transport Partnership carriers.
- Publicize the actual performance data of Partners only with a Partner's express permission, except as otherwise required by law.
- Assist Partners in achieving goals, by working to address challenges, create incentives, and provide technical assistance and support (subject to appropriations).

General terms:

- If the Partner or EPA defaults upon this agreement at any point, the agreement shall be considered null and void.
- Either party can terminate the agreement at any time without prior notification or penalties or any further obligation. EPA and the Partner agree not to comment publicly regarding the withdrawal of Partners.
- EPA reserves the right to suspend or revoke Partner status for any Partner that fails to accomplish the specific actions to which it committed in the SmartWay Transport Partnership Agreement and subsequent Agreements.
- The Partner agrees that it will not claim or imply that its participation in the SmartWay Transport Partnership constitutes EPA approval or endorsement of anything other than the Partner's commitment to the program. The Partner will not make statements or imply that EPA endorses the purchase or sale of the Partner's products and services or the views of the organization.
- The Partner understands that it bears its own costs for participation in this program, and agrees not to submit a claim for compensation to EPA or any other Federal agency on the basis of this agreement.
- The terms "Partner" and "Partnership," as used in this agreement, do not denote any specific legal entity meaning. The parties to this agreement are independent legal entities and no partnership, general partnership, limited partnership, joint venture or any other legal entity relationship is created between the parties by this agreement.

Authorized Partner Official:

The undersigned, on behalf of _____, understands and agrees to the terms of the EPA SmartWay Transport Partnership.

SIGNATURE OF VICE PRESIDENT OR EQUIVALENT

TITLE

PRINT NAME

ZIP

E-MAIL

PHONE

Designated Partner Representative:

NAME

TITLE

ADDRESS

ZIP

E-MAIL

PHONE

FAX



Truck and rail operators are using a multitude of strategies to reduce the environmental impacts of carrying America's freight. Shippers are working to do their part too, not only by implementing measures at facilities that improve efficiency and lead to emissions reductions, but also by hiring the most environmentally responsible carriers. The following technologies and strategies are just some of the measures shippers can adopt to facilitate reductions in fuel consumption and emissions associated with freight shipping activities.

Intermodal Shipping

Many goods and materials may be delivered to distribution hubs more efficiently by rail than by truck.

- Intermodal shipping combines the fuel efficiency of rail with the logistical strengths of trucking.
- Standardized containers are easily transferred between rail and truck.
- Intermodal shipping can minimize overall fuel consumption, reduce emissions, and lower the costs of freight delivery.

Driver Comfort Stations

Drivers may spend a great deal of their work day idling their trucks to stay comfortable at shipping and receiving docks.

Shippers can provide climate controlled comfort stations at dock facilities so that drivers won't need to idle their trucks to stay warm or cold. Eliminating idling provides significant fuel, emissions and maintenance benefits, and the improved driver comfort enhances safety.

Preferential Loading and Unload

SmartWay Transport Shippers can support the goals of the Partnership by providing special shipping and receiving privileges for SmartWay Transport Carriers.

Deliveries by Partner carriers may be given prime shipping and delivery times and positions. Selected docks may be designated as "SmartWay Transport Docks."

Idle Reduction Policies

Shippers usually have control over access to their docking facilities including any parking or waiting areas.

A shipper may implement a "No Idling" policy for any truck that picks up or delivers freight to its facilities.

"No idling" policies may best be combined with driver comfort stations, so drivers have an opportunity to take breaks while waiting. Idling trucks contribute to poor air quality issues, especially in urban areas where environmental justice may be a concern.

Improved Pickup and Delivery Scheduling

Excess waiting time for drivers often leads to excess idling and the increased fuel use and emissions.

Shippers can improve scheduling with enhanced communications or logistics software. Improved pick up and delivery scheduling reduces excess idling and improves the on-time efficiency of freight operations.

Full Truckloads

Goods and materials are sometimes shipped on partially loaded trucks in the interest of expediency, increasing overall fuel use and shipping costs.

Shippers can improve truckload scheduling with logistics software that helps to ensure full loads. Full truckloads not only improve efficiency, but also help reduce congestion on the roadways and at shipping and receiving facilities.



Shipper Corporate Fleet Improvements

Shippers often have small fleets of light duty vehicles (cars and light trucks) used around their facilities or for staff travel.

Reducing older vehicles with more fuel-efficient and lower emitting vehicles reduces a company's overall environmental impact.

Warehouse Improvements

Shippers should consider any improvements in and around warehouses that will facilitate improved efficiency and emissions reductions.

Warehouse operations can have a direct impact on the efficient loading and unloading of delivery trucks. Shippers should explore any efficiency gains that can be made with improved storage and warehouse logistics techniques.

Electric Forklifts

Many freight facilities still use diesel-powered forklifts to carry pallets, crates, etc., between the dock and warehouse

Electric forklifts are cleaner and more efficient to operate, producing no emissions at the facility. Utilizing electric forklifts reduces a company's environmental impact and improves ambient air quality in and around freight docking areas. Facilities might also consider alternatively fueled forklifts that run on compressed natural gas or propane.



Partnership Agreement: Shippers

EPA's SmartWaySM Transport Partnership is an innovative program that recognizes Partners for setting and achieving greenhouse gas (GHG) reduction goals in freight transport.

With this agreement,
and commits to:

, joins EPA's SmartWay Transport Partnership

Determine the percentage of freight shipped (or received) by SmartWay Transport Partnership carriers (results attached).
Measure the greenhouse gas emissions of our freight facility operations using EPA's FLEET Performance Model-Shipper Module.

Increase the percentage of freight shipped (or received) with SmartWay Transport Partner least 50%

(weighted by carrier environmental performance) on the FLEET Performance Model, and its gas emissions of our freight facility operations, each of these goals to be achieved within this agreement.

Develop an Action Plan detailing how each of these goals will be achieved.

Submit the goals and Action Plan to EPA within 6 months of signing and submitting this agreement.

Report progress toward achieving each of these goals to EPA annually.

In return, EPA commits to:

Increase public awareness of Partner participation in the SmartWay Transport Partnership by listing Partners on the EPA SmartWay Transport Partnership Website and in related educational, promotional, and media materials. EPA will obtain express written consent from the Partner before publishing the Partner's name other than in the context of increasing public awareness of its participation as described here.

Publicize the actual performance data of Partners only with a Partner's express permission, except as otherwise required by law.

Provide Shippers with the needed information to quantify emissions from their freight facility operations, and to determine the percentage of freight shipped with SmartWay Transport Partner Carriers.

Assist Partners in achieving goals by working to address challenges, create incentives, and provide technical assistance and support (subject to appropriations).

General terms:

If the Partner or EPA defaults upon this agreement at any point, the agreement shall be considered null and void.

Either party can terminate the agreement at any time without prior notification or penalties or any further obligation.

EPA agrees not to comment publicly regarding the withdrawal of Partners.

EPA reserves the right to suspend or revoke Partner status for any Partner that fails to accomplish the specific actions to which it committed in the SmartWay Transport Partnership Agreement and subsequent Agreements.

The Partner agrees that it will not claim or imply that its participation in the SmartWay Transport Partnership constitutes EPA approval or endorsement of anything other than the Partner's commitment to the program. The Partner will not make statements or imply that EPA endorses the purchase or sale of the Partner's products and services or the views of the organization.

The Partner understands that it bears its own costs for participation in this program, and agrees not to submit a claim for compensation to EPA or any other Federal agency on the basis of this agreement.

Authorized Partner Official:

The undersigned, on behalf of _____
understands and agrees to the terms of the EPA SmartWay Transport Partnership.

SIGNATURE OF VICE PRESIDENT OR EQUIVALENT

TITLE

PRINT NAME

DATE

Designated Partner Representative:

TITLE

CITY

STATE

ZIP

EMAIL

PHONE

FAX



Join the SmartWay Transport Partnership TODAY!

Becoming a SmartWay Transport Shipper Makes Good Business Sense

Improve Your Savings by Improving your Environmental Performance:

SmartWay Transport Partners use freight carriers that are improving their own fuel efficiency while shippers are improving the efficiency of shipping and receiving operations. This translates to money saved and reduced environmental impacts from your freight shipping. As a SmartWay Transport Partner, you will have the information necessary to make beneficial decisions regarding carrier selection.

Quantify your Environmental Achievements:

Emission reductions may be valuable on the open market through trading and credit programs already in development nationally and internationally. EPA's FLEET Performance Shipper Model allows you to track and manage your greenhouse gas emission reductions from freight activities.

Promotional Opportunities and Public Recognition:

The SmartWay Transport Partner brand of excellence is awarded to qualifying Partners as a visible cue to your business customers, clients, and consumers to use in their advertising and other promotional media. It tells them that you are a champion of environmental stewardship and helps them to make educated choices about SmartWay Transported products. Visible exposure through national and regional events, advertisements, articles and special recognition are just a few ways that EPA commits to recognize your achievements.

"Businesses have an opportunity and a responsibility to do what they can to protect the environment. It's important to our customers and it's important to healthy communities, so we encourage all companies to join us in this great effort with SmartWay."

—Winell Herron, V.P. of Public Affairs and Diversity, H-E-B

Becoming a Partner is Easy

When you join the SmartWay Transport Partnership, you commit to:

- Increase the percentage of freight shipped by SmartWay Transport Partnership Carriers;
- Measure the greenhouse gas emissions of your operations using the FLEET Performance Model;
- Identify a goal to reduce the greenhouse gas emissions from freight facility operations;
- Develop a Plan detailing how each of these goals will be achieved; and
- Report progress toward achieving each of these goals to EPA annually.

Simply mail or fax the signed Partnership Agreement to:

SmartWay Transport Partnership
U.S. EPA Office of Transportation and Air Quality
2000 Traverwood
Ann Arbor, MI 48105
Fax: (734) 214-4052

"SmartWay incorporates elements that we feel are consistent with how we approach our business and how we want our service providers to approach things as well"

- Sabina Strautman, IKEA USA

Then download the FLEET Performance Model at www.epa.gov/smartway, fill in your information, and email the completed model to smartway_transport@epa.gov. Your Partner Welcome Kit will be mailed to you shortly.

Become a SmartWay Transport Shipper TODAY!

For more information about joining the SmartWay Transport Partnership, call us at (734) 214-4767.

♻️ Recycled/Recyclable, Printed with Vegetable Oil-Based Inks on Recycled Paper, Minimums: Post-consumer Processed Chlorine Free

U.S. Environmental Protection Agency • Office of Transportation and Air Quality • 2000 Traverwood, Ann Arbor, MI 48105 • (734) 214-4767 • Fax: (734) 214-4052 • www.epa.gov/smartway



SmartWay Transport


You are here: [EPA Home](#) | [Transportation and Air Quality](#) | [SmartWay Home](#) | [SmartWay Transport Partner List](#)

<http://www.epa.gov/smartway/transport/partner-list/index.htm>
Last updated on Wednesday, October 15th, 2008.



The Smart Way to Save Fuel,
Money, and the Environment

SmartWay Transport Partners and Affiliates

All current SmartWay Transport Partners and Affiliates are listed below. SmartWay Truck Carriers, Rail Carriers, and Logistics Companies have fuel efficiency/environmental performance scores (see score [explanation](#)). Those with exceptional scores are labeled with .











Please note: EPA may not endorse the products or services of commercial companies. Any reference to a specific commercial product or service by trade name, trademark, manufacturer, company, or otherwise does not constitute or imply the endorsement or recommendation of the U.S. Environmental Protection Agency.

Refine by: [A](#) | [B](#) | [C](#) | [D](#) | [E](#) | [F](#) | [G](#) | [H](#) | [I](#) | [J](#) | [K](#) | [L](#) | [M](#) | [N](#) | [O](#) | [P](#) | [Q](#) | [R](#) | [S](#) | [T](#) | [U](#) | [V](#) | [W](#) | [X](#) | [Y](#) | [Z](#) |

Top SmartWay Score

Partners	Score	Type of Partner
101 Transport, Inc.	1.25	Truck Carrier
3PD, Inc.	0.75	Truck Carrier
4 Elements, Inc.		Logistics
4 State Trucks, Inc.		Dealer/Service Center

Partners	Score	Type of Partner
A & S Trucking Service, Inc.	0.75	Truck Carrier
A.C. Trucking, Inc.	0.75	Truck Carrier
A.D. Transport Express , Inc.	1.25	Truck Carrier
A. L. Smith Trucking, Inc.	1.25	Truck Carrier
A.N. Webber, Inc.	1.00	Truck Carrier
AAA Cooper Transportation	1.00	Truck Carrier
ABF Freight System, Inc.	1.25	Truck Carrier
Abilene Motor Express	1.00	Truck Carrier
Ability Tri-Modal Transportation Services, Inc.	1.25	Truck Carrier
Above Par Transportation, Inc.	1.00	Truck Carrier
ABT, Inc	1.00	Truck Carrier

	Accuride Corporation		Affiliate
	ACT Transportation	1.25	Truck Carrier
	Advanced Transportation Services, Inc.	0.75	Logistics
	Access America Transport	1.25	Logistics
	ACCION New York		Affiliate
	ACT Transportation	1.25	Truck Carrier
	Action Delivery	1.00	Truck Carrier
	Active Transportation Company, LLC	0.75	Truck Carrier
	AdamWorks, LLC		Affiliate
	ADK Manhattan Express, Inc.	1.00	Truck Carrier
	ADM Trucking, Inc.	1.00	Truck Carrier
	Advanced Transit Dynamics, Inc. (ATDynamics)		Affiliate
	Aerodynamic Trailer Systems		Affiliate
	Aeropres Corporation	1.25	Truck Carrier
	AFC Worldwide Express, Inc.	1.25	Logistics
	AFN (Advantage Freight Network)	1.00	Logistics
	Air Traffic Services	1.00	Truck Carrier
	Air-Land Transport Service, Inc.	1.00	Truck Carrier
	Airgo Systems, LLC		Affiliate
	Air-Land Transport Service, Inc.	1.00	Truck Carrier
	AIT Worldwide Logistics	1.25	Logistics
	AJ Saragusa Trucking Company Inc.	0.75	Truck Carrier
	Alaplex Transportation, Inc.	0.75	Truck Carrier
	All American Xpress	1.25	Truck Carrier
	ALL Cartage Transportation	1.25	Truck Carrier
	All Modes, Inc.	0.75	Truck Carrier
	Alliance Shippers, Inc.	1.25	Shipper/Carrier
	Alliance to Save Energy		Affiliate
	Allied Automotive Group	0.75	Truck Carrier
	Allstate Peterbilt of Western Ohio, LLC		Dealer/Service Center
	Allstate Sales and Leasing		Dealer/Service Center
	ALTL, Inc.	1.00	Truck Carrier
	American Best Transportation, Inc.	1.25	Logistics
	American Bestway Transportation, Inc.	0.75	Truck Carrier
	American Cartage, Inc.	0.75	Truck Carrier
	American Central Transport, Inc.	1.25	Truck Carrier
	American Domestic Cargo Services	1.25	Logistics
	American Eagle Lines	1.25	Truck Carrier
	American Freight Carrier Services, Inc.	0.75	Logistics
	American Trucking Associations (ATA)		Affiliate

Ameritrans	1.25	Truck Carrier
Andrews Logistics, Inc.	0.75	Truck Carrier
Andy's Trucking	0.75	Truck Carrier
Anheuser-Busch	0.75	Shipper/Carrier
APC / Habco, Inc.	1.00	Truck Carrier
APL Logistics	1.25	Logistics
Apollo Express, Inc.	1.00	Truck Carrier
Appleton Coated LLC		Shipper
Arandell Corporation		Shipper
Arfsten Transfer Inc.	1.25	Truck Carrier
ARI (Automotive Resources <u>International</u>)		Affiliate
Arizona Trucking Association		Affiliate
Armellini Express Lines, Inc.	1.25	Truck Carrier
Arnold Transportation Services	1.25	Truck Carrier
Arpin International Group, Inc.	0.75	Logistics
Arrow Trucking Company	1.00	Truck Carrier
Arrow Critical Supply Solutions	1.00	Truck Carrier
Associated Global Systems	1.25	Logistics
Association of American Railroads (AAR)		Affiliate
Atkinson Freight Lines	1.25	Truck Carrier
ATL Express, Inc.	0.75	Truck Carrier
Atlanta South 75 Travel Center		Truck Stop
Atlas Van Lines, Inc. Corp HQ	0.75	Truck Carrier
ATS, Inc.	1.25	Truck Carrier
Audit Logistics, LLC	1.25	Logistics
Autotherm Division Enthel Systems, Inc.		Affiliate
AV Logistics, LLC	1.25	Logistics
Avanti Trucking, Inc	1.00	Truck Carrier
Aveda Corporation		Shipper
Averitt <u>Express</u>	1.25	Truck Carrier
Axis Global Systems, LLC	1.00	Logistics
Axis Global Systems	0.75	Truck Carrier
Partners	Score	Type of Partner
B & B Services, Inc.	0.75	Truck Carrier
B & D Trucking Service, Inc.	0.75	Truck Carrier
B.R. Williams Trucking, Inc.	1.25	Truck Carrier
Badger Utility, Inc.		Affiliate
Bailey Farms, Inc./Chile Pepper Transport, Inc.	0.75	Truck Carrier
Barr-Nunn Transportation, Inc.	1.00	Truck Carrier
Barrett Distribution	1.25	Truck Carrier









Baxter Healthcare	0.75	Truck Carrier
Bay and Bay Transportation	1.25	Truck Carrier
Baylor Trucking, Inc.	1.25	Truck Carrier
BBW, Inc.		Affiliate
BCB, Inc.	1.25	Truck Carrier
BCJ Trucking, Inc.	1.00	Truck Carrier
Bear Cartage & Intermodal Inc.	0.75	Truck Carrier
Behnke Dedicated	1.00	Truck Carrier
Bergstrom, Inc.		Affiliate
Best Buy Co., Inc.		Shipper
Best Cartage, Inc.	0.75	Truck Carrier
Best Dedicated, LLC	1.00	Truck Carrier
Best Transportation	0.75	Truck Carrier
Best Transportation Services	0.75	Truck Carrier
BFL , Inc.	1.25	Truck Carrier
Big G Express, Inc.	1.25	Truck Carrier
Big Lots		Shipper
Big Truck TV, Inc.		Affiliate
Bison Transport, Inc.	1.25	Truck Carrier
Black Horse Carriers, Inc.	1.00	Truck Carrier
Black Rock Systems, LLC		Affiliate
Blackhawk Transport, Inc.	1.25	Truck carrier
Blue Planet Logistics	1.25	Logistics
Bluefield Transport, LLC	0.75	Truck Carrier
BMI Motorsports, Inc.	1.25	Truck Carrier
BNSF Logistics	0.75	Logistics
BNSF Railway Company	1.25	Rail Carrier
Bob's Transport & Storage Co., Inc.	1.25	Truck carrier
Boise Boys, Inc.	1.00	Truck Carrier
Boise White Paper LLC	0.75	Truck Carrier
Bolus Freight Systems	1.00	Truck Carrier
Borgen Systems	0.75	Truck Carrier
BP Lubricants USA, Inc.		Shipper
Braun's Express, Inc.	0.75	Truck Carrier
Brennan Transportation	0.75	Truck Carrier
Brent Redmond Transportation, Inc.	1.25	Truck Carrier
Brian Kurtz Trucking, Ltd.	1.25	Truck Carrier
Bridge Terminal Transport, Inc.	0.75	Non Asset Based Carrier
Bridgestone-Firestone North American Tire, LLC	1.00	Shipper/Carrier
British Columbia Trucking Association		Affiliate








Brookline Transportation Company, Inc.	0.75	Truck Carrier
Brubacher Excavating, Inc.	0.75	Truck Carrier
Bruce's Truck Stop		Truck Stop
Building Systems Transportation	1.25	Truck Carrier
Bulk Plus Logistics	0.75	Logistics
Bulldog Hiway Express	0.75	Truck Carrier
Burns Motor Freight, Inc.	0.00	Truck Carrier
Businesses for the Bay		Affiliate







C

Partners












	Score	Type of Partner
C & C Trucking of Duncan SC	1.25	Truck Carrier
C & K Trucking, LLC	0.75	Truck Carrier
C.A.T. Inc.	1.25	Truck Carrier
C. Brown Trucking Company	1.00	Truck Carrier
C. C. Jones, Inc.	1.00	Truck Carrier
C. H. Robinson Worldwide, Inc.	0.75	Logistics
C.R. England, Inc.	1.25	Truck Carrier
C2C Global Transportation, Inc.	0.75	Truck Carrier
Cal Ark International	1.25	Truck Carrier
CabAire, LLC		Affiliate
California Cartage Express	0.00	Non Asset Based Carrier
California Multimodal, LLC	0.75	Non Asset Based Carrier
California Trucking Association		Affiliate
Camionnage C.P. Inc.	0.75	Truck Carrier
Can-Am west Carriers Inc.	1.25	Truck Carrier
Canadian National Railway Company	1.25	Rail Carrier
Canadian Pacific Railway	1.25	Rail Carrier
Canadian Trucking Alliance		Affiliate
CANEX, Inc.	0.75	Truck Carrier
Canon U.S.A., Inc. (Charter Partner)		Shipper
Caravan Logistics, Inc.	0.75	Truck Carrier
Cardinal Logistics Management Corporation	1.00	Truck Carrier
Cargill Midatlantic	1.00	Truck Carrier
Cargo Transporters	1.00	Truck Carrier
Carlisle Transportation Systems, Inc.	1.25	Truck Carrier
Carlisle Carrier Corp.	0.75	Truck Carrier
Carrier Industries, Inc.	1.25	Truck Carrier
Carrier Transicold		Affiliate
Carroll Fulmer Logistics Corporation	1.00	Truck Carrier
Cascade Sierra Solutions		Affiliate

	Cascades Transport, Inc.	1.25	Shipper/Carrier
	Caterpillar Logistics Services, Inc.	1.25	Logistics
	Cavalry Xpress	0.75	Logistics
	CCC Transportation, LLC.	1.00	Truck Carrier
	Celadon <u>Trucking</u> Services, Inc.	1.25	Truck Carrier
	Celtic International	1.25	Logistics
	Cemex, Inc. dba Sunwest Trucking	0.75	Truck Carrier
	Central Indiana Clean <u>Cities</u> Alliance, Inc.		Affiliate
	Central Refrigerated Service, Inc.	1.25	Truck Carrier
	Central Transport International, Inc.	1.25	Truck Carrier
	Ceva Freight Management	0.75	Logistics
	<u>Challenger</u> Motor <u>Freight</u> , Inc.	1.25	Truck Carrier
	Champion Logistics Group	0.75	Truck Carrier
	Checker logistics	0.75	Truck Carrier
	Cheeseman LLC	1.25	Truck Carrier
	CHEP USA		Shipper
	Chiquita Brands International		Shipper
	Christenson Transportation, Inc.	0.75	Truck Carrier
	Church & Dwight Company		Shipper
	Circuit City Stores		Shipper
	CK Courier	0.75	Truck Carrier
	Clancy Moving Systems	1.00	Truck Carrier
	Clanton Trucking, Inc.	1.00	Truck carrier
	Classic Carriers, Inc.	0.75	Truck Carrier
	Clean Air Minnesota		Affiliate
	Clean Diesel Technologies, Inc.		Shipper
	Clean Fuels Ohio		Affiliate
	Cleveland Peterbilt, LLC		Dealer/Service Center
	CLIF Bar & Company		Shipper
	Clinton's Ditch <u>Coop</u> Co., Inc.	1.25	Truck Carrier
	Cloverleaf Transport	0.00	Truck Carrier
	Coastal Pacific Xpress, Inc.	1.25	Truck Carrier
	Coca-Cola Enterprises, Inc.	0.75	Shipper/Carrier
	Coextruded Plastic Technologies, Inc.		Shipper
	Colonial Cartage Corp.	1.25	Truck Carrier
	Colorado Motor Carriers Association		Affiliate
	Columbus Peterbilt		Dealer/Service Center
	Combined Transport, Inc.	1.25	Truck carrier
	Comfort Innovations, LLC		Affiliate
	Comfort Master		Affiliate

	Command Transportation	1.25	Logistics
	Commercial Transportation, Inc.	1.25	Truck Carrier
	Contrak Logistics, Inc.	1.25	Truck Carrier
	Concentrek	1.00	Logistics
	Conservation Technology Information Center (CTIC)		Affiliate
	Continental Express, Inc. (OH)	1.25	Truck Carrier
	Continental Express Inc. (AR)	1.25	Truck Carrier
	Continental Freight Services, Inc.	0.75	Logistics
	Continental Tire		Shipper
	Con-way Freight	1.25	Truck Carrier
	Con-way Truckload	1.25	Truck Carrier
	Coors Brewing Company		Shipper/Carrier
	Copeland Trucking	0.75	Truck Carrier
	Cornhusker Motor Lines, Inc.	1.25	Truck Carrier
	Corrugated Logistics, LLC	1.25	Truck Carrier
	Council of <u>Supply Chain Management</u> Professionals		Affiliate
	Covenant <u>Transport, Inc.</u>	1.25	Truck Carrier
	Cowan Systems, LLC	0.75	Truck Carrier
	Cox Transfer, Inc.	1.25	Truck Carrier
	Cox Transportation Services, Inc.	1.25	Truck Carrier
	Coyote Logistics	1.25	Logistics
	Crane Worldwide Logistics	0.75	Logistics
	Cressler Trucking, Inc.	1.25	Truck Carrier
	Crete Carrier Corporation	1.25	Truck Carrier
	<u>Crowley Trucking, Inc.</u>	0.75	Truck Carrier
	Crown Xpress Transport	0.75	Truck Carrier
	CRST Van Expedited, Inc	1.25	Truck Carrier
	CSX Transportation	1.25	Rail Carrier
	CT Transportation	0.75	Truck Carrier
	CTS Advantage Logistics	0.75	Truck Carrier
	Cummins Emission Solutions		Affiliate
	CW Johnson Xpress, LLC	1.25	Truck Carrier
	Partners	Score	Type of Partner
	D & D Family Enterprises, LLC	0.00	Truck Carrier
	O & O Sexton, Inc.	1.00	Truck Carrier
	D.C. Express, Inc.	1.00	Truck Carrier
	D. M. Bowman, Inc.	1.25	Truck Carrier
	Daily Express, Inc.	0.75	Truck Carrier

	Danny Heiman Trucking Inc.	1.25	Truck Carrier
	DaRan, Inc.	0.75	Truck Carrier
	Dart Advantage Logistics	0.75	Logistics
	Dart Transit Co.	1.00	Non Asset Based Carrier
	David Stahl Trucking	1.25	Truck Carrier
	Davis Express, Inc.	1.25	Truck Carrier
	Davis Transfer Co.	1.25	Truck Carrier
	Daybreak Express Inc.	1.00	Truck Carrier
	Dayton Freight Lines, Inc.	0.75	Truck Carrier
	DC Power Solutions		Affiliate
	DCM Transport, Inc	0.75	Truck Carrier
	De Mase Trucking Co., Inc.	0.75	Truck Carrier
	deBoer <u>Transportation</u> , Inc.	1.25	Truck Carrier
	Decker Truck Line	1.25	Truck Carrier
	Dell, Inc.		Shipper
	Demar Logistics, Inc.	1.25	Truck Carrier
	Denis Gray Trucking, Inc.	1.25	Truck Carrier
	Denmark Express, Inc.	1.00	Truck Carrier
	DENSO Manufacturing Michigan, Inc.		Shipper
	Dependable Highway Express	1.00	Truck Carrier
	DeTore Enterprises, LLC	1.00	Truck Carrier
	DF Hammonds, Inc.	1.00	Truck Carrier
	DHL <u>Express</u>	0.75	Truck Carrier
	Diageo		Shipper
	Diamond Express, Inc.	0.75	Truck Carrier
	Diamond Power Systems		Affiliate
	Dick Lavy Trucking, Inc.	1.00	Truck Carrier
	Diesel technology Forum		Affiliate
	Dillon Transport, Inc.	1.25	Truck Carrier
	Dimension Transportation, Inc.	0.75	Truck Carrier
	Direct Service Network, Ltd.	0.75	Logistics
	Dist-Trans Company	0.75	Truck Carrier
	Distribution & LTL Carriers Association		Affiliate
	Dohrn Transfer	0.75	Truck Carrier
	Dometic Environmental Corporation		Affiliate
	Donada, Inc.	1.25	Truck Carrier
	Donfen Corporation		Affiliate
	DOT Transportation, Inc.	1.00	Truck Carrier
	Dot-Line Transportation	1.25	Truck Carrier
	Driver Comfort Systems		Affiliate
	Driver Management Services		Affiliate

DSU Peterbilt & GMC Inc		Dealer/Service Center
Dunamis Power Systems		Affiliate
Dupre Transport, LLC	1.00	Truck Carrier
Dura Freight Lines	1.25	Truck Carrier
Dutch Maid Logistics, Inc.	1.00	Truck Carrier
Partners		Type of Partner
E-Z On Power Systems, LLC		Affiliate
EA Logistics	1.25	Truck Carrier
Eagle Motor Freight, Inc.	0.75	Truck Carrier
Eagle Systems, Inc.	1.00	Truck Carrier
Earl L. Henderson Trucking Co., Inc.	1.25	Truck Carrier
Eastern Freight Ways, Inc.	1.25	Truck Carrier
Eastman Kodak Company		Shipper
ECM Transport, LLC	1.00	Truck Carrier
eCycle, Inc.		Affiliate
Edge trucking, LLC	1.00	Truck Carrier
ELDS Trucking, Inc.	1.25	Truck Carrier
Eleets Transportation	1.25	Logistics
Elite Carriers, LLC	1.00	Truck Carrier
ELITeXPO Cargo Systems, Inc.	1.25	Logistics
ELICO Logistics, Inc.	1.25	Truck Carrier
Emerson Electric Company	1.25	Truck Carrier
EMKAY, Inc.		Affiliate
EMM Logistics, Inc.	1.00	Logistics
Emm Trucking, Inc.	1.25	Truck Carrier
Empire Express, Inc.	1.25	Truck Carrier
Ensenda	0.75	Logistics
Enterprise Rent-A-Car		Affiliate
ERes <u>Logistics</u> Services, Inc.	1.25	Logistics
Epes Transport System, Inc	1.25	Truck Carrier
ESI Global Logistics	1.00	Logistics
Espar Heating Systems		Affiliate
 Estenson Logistics, LLC	1.25	Truck Carrier
 Estes Air Forwarding, LLC	1.25	Logistics
 Estes Express Lines	1.25	Truck Carrier
 Evans Delivery Company, Inc.	1.25	Truck Carrier
Excargo Services	0.00	Truck Carrier
Exel, Inc. - Contract Logistics	1.25	Logistics
Exel Transportation Services	1.25	Logistics

	Expeditors International of Washington, Inc.	1.00	Logistics
	Extra Express	0.75	Truck Carrier
	Exxon Mobil Fuel Marketing Company	1.25	Truck Carrier
	Eye for Transport		Affiliate
	Partners	Score	Type of Partner
	Fabri-Kal Corporation	1.00	Truck Carrier
	Falcon Transport Co.	1.25	Truck Carrier
	Family Logistics, LLC	0.75	Truck Carrier
	Farruggio's Express	0.75	Truck Carrier
	Federal Warehouse Company	1.00	Truck Carrier
	FedEx Express Corporation (Charter Partner)	1.25	Truck Carrier
	FedEx Freight System, Inc. (Charter Partner)	1.25	Truck Carrier
	FedEx Ground Package System, Inc.	0.75	Truck Carrier
	Fetch Logistics	0.75	Logistics
	FFE Transportation Services, Inc.	1.25	Truck Carrier
	FirstFleet, Inc.	0.75	Truck Carrier
	Flagstone Logistics, LLC.	0.75	Logistics
	Fleet Advantage, LLC		Affiliate
	Flexway Trucking, Inc.	0.75	Truck Carrier
	Florida East Coast Railway	1.25	Rail Carrier
	Florida Trucking Association, Inc.		Affiliate
	Flynn Transportation Services	1.25	Logistics
	Food Lion, LLC	1.00	Truck Carrier
	Foreway Management Services	1.25	Logistics
	Foreway Transportation, Inc.	1.25	Truck Carrier
	Fortune Transportation Co.	1.25	Truck Carrier
	Forward Air, Inc.	1.25	Truck Carrier
	Foss Maritime Company	0.75	Truck Carrier
	Four Star Couriers, Inc.	1.00	Truck Carrier
	Fraley & Schilling, Inc.	1.25	Truck Carrier
	Freedom Lines	1.00	Logistics
	Freeman Transportation	1.25	Logistics
	Frehn Center for Professional & Operational Development		Affiliate
	Freight Management, Inc.	1.25	Logistics
	Freight Solution Providers	1.25	Truck Carrier
	Freight Wing, Inc.		Affiliate
	Frerichs Freight Lines, Inc.	0.75	Truck Carrier
	Freymler, Inc.	1.00	Truck Carrier
	Frito-Lay North America	1.25	Truck Carrier

Frock Bros. Trucking, Inc.	1.25	Truck Carrier
Froehlich Trucking	0.75	Truck Carrier
Frontier South Transport Corp.		Non Asset Based Carrier
FTI - Bill Thompson Transport Inc.	1.25	Truck Carrier
Fuel Injection Sales & Service, Inc.		Affiliate
Fujitsu Computer Products of America, Inc.		Shipper
Fujitsu Computer Systems Corp.		Shipper

G


**Partners**






































	Score	Type of Partner
G & D Integrated	1.00	Truck Carrier
G&P Trucking Company	1.25	Truck Carrier
Gainey Transportation Services, Inc.	1.00	Truck Carrier
Gangloff Industries, Inc.	1.25	Truck Carrier
Garner Trucking, Inc.	0.75	Truck Carrier
GDP Transportation	1.00	Truck Carrier
Gei-Corp. Trucking	1.00	Truck Carrier
General Freight Services, Inc.	1.25	Logistics
General Nutrition Centers (GNC)	1.25	Shipper/Carrier
George's Foods, LLC	0.75	Truck Carrier
Georgia Pacific		Shipper
Georgia Motor Trucking Association, Inc.		Affiliate
GFS Transport	0.75	Truck Carrier
Giant of Maryland, LLC	1.25	Shipper/Carrier
Gilbert Express	0.75	Truck Carrier
Gifts In Kind		Shipper
Glacier Bay, Inc.		Affiliate
GlaxoSmithKline Consumer Healthcare NA		Shipper
Global Tranz	1.25	Logistics
Go-To Transport, Inc.	1.25	Truck Carrier
Golden State Peterbilt		Dealer/Service Center
Goodyear Tire & Rubber Company		Shipper
Gordon <u>Trucking</u> , Inc.	1.25	Truck Carrier
Grain and Feed Association of Illinois		Affiliate
Grammer Industries, Inc.	0.75	Truck Carrier
Grand Island Express	1.25	Truck Carrier
Greatwide Logistics Services	1.25	Truck Carrier
Green Mountain Coffee Roasters	0.75	Truck Carrier
Green Truck Rental & Roadways	0.75	Truck Carrier
Green Trucker		Affiliate
Green Wheels, LLC	1.00	Truck Carrier

Greenbush Logistics, Inc.	1.00	Truck Carrier
Griffin Transportation, Inc.	0.75	Truck Carrier
GST Transport Systems, LLP	1.25	Truck Carrier
Guess Freightways, Inc.	1.00	Truck Carrier

H**Partners****Score Type of Partner**

H & R Transport Ltd.	1.25	Truck Carrier
H & W Trucking	1.25	Truck Carrier
H. D. Edgar Trucking Co., Inc.	0.75	Truck Carrier
H. a. Wolding, Inc.	1.25	Truck Carrier
Hall Bros. Transportation Co., Inc.	1.25	Truck Carrier
Hall's Fast Motor Freight, Inc.	1.00	Truck Carrier
Halvor Lines, Inc.	1.25	Truck Carrier
Hannaford <u>Trucking Company</u>	1.25	Truck Carrier
Hardy Brothers, Inc.	1.25	Truck Carrier
Harte-Hanks	1.25	Logistics
Hartley Trucking Co., Inc.	1.00	Truck Carrier
Hartsfield Warehouse Co., Inc.	0.75	Truck Carrier
Hartt Transportation	1.25	Truck Carrier
Haworth, Inc.		Shipper
Heartland Express	1.00	Truck Carrier
<u>HEB</u>	1.25	Truck Carrier
Hendrickson Trucking, Inc.	1.25	Truck Carrier
Hendrickson USA, LLC		Affiliate
Herche Transfer Co.	1.00	Truck Carrier
Hermann Transportation Services	1.00	Truck Carrier
Hess Trucking, Co.	1.25	Truck Carrier
Hesstech, LLC		Shipper
Hewlett Packard		Shipper
Heyl Truck Lines, Inc.	1.25	Truck Carrier
Hill Brothers Transportation	1.00	Truck Carrier
Hill's Pet Nutrition Sales, Inc.		Shipper
Hodyon		Affiliate
Hogan Transports, Inc. /Hogan Dedicated Services	1.25	Truck Carrier
Holcim (US) Inc.		Shipper
Hollenbeck Enterprises, Inc.	1.00	Truck Carrier
Holman Transportation, LLC	0.75	Truck Carrier
Horizon Lines, Inc.	1.25	Truck Carrier
Hospira Fleet Services, LLC	1.25	Truck Carrier
<u>Hows Freightways, Inc.</u>	1.25	Truck Carrier


 Howell's Motor Freight, Inc.	1.25	Truck Carrier
Hub Group, Inc.	1.25	Logistics
Hudson's Bay Company	1.25	Shipper/Carrier
Hutt Trucking Co., Inc.	1.25	Truck Carrier
HVH Transportation, Inc.	1.25	Truck Carrier
Hybrid Transit Systems, Inc.	0.75	Logistics
Hyway Trucking Company	1.00	Truck Carrier
Partners		
I. E. Express Trucking, Inc.	1.00	Truck Carrier
IBM		Shipper
ICON Transportation	1.25	Truck Carrier
Idaho Trucking Association, Inc.		Affiliate
Idle Kleen, Inc.		Affiliate
IdleAire Technologies		Shipper
IKEA Distribution Services North America Charter Partner		Shipper
Illinois Corn Growers Association		Affiliate
Illinois Trucking Association, Inc.		Affiliate
Independent Printing Co., Inc.	1.25	Shipper/Carrier
Indiana Corn Marketing Council		Affiliate
Indiana Department of Environmental Management (IDEM), Office of Pollution and Technical Assistance (OPPTA)--Awards and Grants		Affiliate
Indiana Motor Truck Association		
Indiana Western Express, Inc.		Truck Carrier
Indiana Soybean Alliance		Affiliate
Inflight Express, Inc.	1.25	Truck Carrier
Integra Logistics, LLC	0.75	Logistics
Inter-Coastal, Inc.	1.00	Truck Carrier
Interface, Inc. (Charter Partner)		Shipper
Intermodal Sales Corporation	1.25	Logistics
International Motor <u>Freight</u>	0.75	Truck Carrier
Interstate Distributor Co.	1.25	Truck Carrier
Iowa Motor Truck Association		Affiliate
Iowa State University Center for Transportation Research and Education		Affiliate
Iron Springs Transportation	1.25	Carrier
Island Movers, Inc.	1.25	Truck Carrier
ITS Distributing		Affiliate
ITW TACC		Shipper










Partners		Score	Type of Partner
	J & J Industries, Inc.		Shipper
	J & P Hall Express	1.00	Truck Carrier
	J T Express, Inc.	0.75	Truck Carrier
	J&R Schugel Trucking, Inc.	1.25	Truck Carrier
	J.B. Hunt Transport, Inc.	1.25	Truck Carrier
	J. J. Keller & Associates, Inc.		Shipper
	J. S. Helwig & Son, LLC.	1.25	Truck Carrier
	J-Mar Express, Inc.	1.25	Truck Carrier
	Jack Cooper Transport Co., Inc.	1.00	Truck Carrier
	Jacobson Transportation Company	1.25	Truck Carrier
	James Burg Trucking Company	0.75	Truck Carrier
	James H. Clark & Son, Inc.	1.25	Truck Carrier
	James J. Williams, Inc.	1.00	Truck Carrier
	<u>JC Penney</u>		Shipper
	JDT Transport, LLC	1.25	Logistics
	Jefco, Inc.	1.25	Truck Carrier
	JF Global Logistics	1.00	Truck Carrier
	John Christner Trucking, LLC	1.25	Truck Carrier
	John Veriha Trucking, Inc.	1.25	Truck Carrier
	Johns Manville		Shipper
	Johnson & Johnson Sales & <u>Logistics Company, LLC</u>		Shipper
K			
	Partners	Score	Type of Partner
	K&B Transportation, Inc.	1.25	Truck Carrier
	Kane 3rd Party Logistics, LLC	1.00	Truck Carrier
	Kane Freight Lines, Inc.	0.75	Truck Carrier
	Kane Traffic Services, Inc.	1.25	Logistics
	Kansas City Railway Company	1.25	Rail Carrier
	Karry All Transportation, Inc.	1.00	Truck Carrier
	KBD Transportation	1.25	Truck Carrier
	Kebo transportation Services, Inc.	1.00	Truck Carrier
	Keen Transport, Inc.	1.25	Truck Carrier
	Kelle's Transport Service, Inc.	0.75	Truck Carrier
	Kelron Logistics	0.75	Logistics
	Kennesaw Transportation, Inc.	1.25	Truck Carrier
	Kentucky Motor Transport Assoc., Inc		Affiliate
	Kenworth Sales Company		Dealer/Service Center
	Kerry transport, Inc.	1.25	Truck Carrier




Keystone Freight Corp. (National Retail Systems, Inc.)	1.25	Truck Carrier
KFS, Inc	1.25	Logistics
Kimball International	1.25	Shipper/Carrier
Kimberly-Clark		Shipper
King Solutions, Inc.	0.75	Logistics
Kingsway Transport	0.75	Truck Carrier
KKW Trucking, Inc.	0.75	Truck Carrier
KLLM, Inc.	1.00	Truck Carrier
<u>Knight Transportation, Inc.</u>	1.25	Truck Carrier
Kohl's Department Stores, Inc		Shipper
Kohler Company		Shipper/Carrier
Kohler Power Systems		Affiliate
Kraft Foods Global, Inc.	1.25	Shipper/Carrier
Kreilkamp Trucking, Inc.	1.25	Truck Carrier
Kriska Holdings Limited	1.25	Truck Carrier
Kroger Company	0.75	Shipper/Carrier
Kruse Nationwide, Inc.	1.25	Truck Carrier
Kufahl Transport	0.75	Truck Carrier
Kuperus Trucking, Inc.	1.00	Truck Carrier
Kutzler Express, Inc.	0.75	Truck Carrier

Partners	Score	Type of Partner
LE. Tucker & Son, Inc.	1.25	Truck Carrier
L. J. Rogers Trucking	1.25	Truck Carrier
Lacy's Express	1.25	Truck Carrier
LaGrange Warehouse and Distribution Center, Inc.	0.75	Truck Carrier
Lake Erie Transportation Co. Inc.	1.25	Truck Carrier
Lakeside <u>Logistics, Inc.</u>	0.75	Logistics
Lakeville Motor Express, Inc	1.00	Truck Carrier
Lance, Inc.	0.75	Shipper/Carrier
Land Span, Inc.	1.25	Truck Carrier
Landair <u>Transport, Inc.</u>	1.00	Truck Carrier
Landstar System, Inc.	0.75	Non Asset Based Carrier
Lane Balance Systems	0.75	Truck Carrier
Lane Regional Air Pollution <u>Authority (LRAPA)</u>		Affiliate
<u>Langford Inc.</u>	1.25	Truck Carrier
Laris Shelman & Sons Trucking Inc.	1.25	Truck Carrier
Lasco Bathware Trucking Company, Inc.	1.00	Truck Carrier
Lavigne Truck Lines	1.25	Truck Carrier

Laydon Composites, Ltd.		Affiliate
Leading Green Distributing, Inc.	0.00	Truck Carrier
Lenovo		Shipper
Leonard's Express, Inc.	0.75	Truck Carrier
Lester Coggins Trucking, Inc.	1.25	Truck Carrier
Lexmark International, Inc.		Shipper
LHP Transportation Services, Inc. (LHPB) Brokerage	0.75	Truck Carrier
LHP Transportation Services, Inc. (Rail Division)LHPT	1.25	
Liberty Linehaul, Inc.	1.25	Truck Carrier
Liberty Linehaul West, Inc.	0.75	Truck Carrier
Lighthouse Trucking 1, Inc.	1.00	Truck Carrier
Lily Transportation Corp.	0.75	Truck Carrier
Limited Brands Logistics Services		Shipper
LinkAmerica Transportation, Inc.	1.00	Truck Carrier
Lion BG, Inc.	1.25	Truck Carrier
Lisa Motor Lines, Inc.	1.25	Truck Carrier
Li-Way Transfer and Storage	0.75	Truck Carrier
Lobster Truck & Rental, Inc.		Dealer/Service Center
LoneStar Transportation, Inc.	1.00	Truck Carrier
Longrider Lubricants, LLC		Shipper
Lowe's		Shipper
LTI Trucking Services	1.25	Truck Carrier
Lund Trucking Company, Inc.	1.25	Truck Carrier
Luther Logistic Transportation, LLC	1.00	Truck Carrier
Lynden Transport, Inc.	1.25	Truck Carrier
M		
Partners	Score	Type of Partner
M & M X-Press Service, LTD.	1.00	Truck Carrier
M & W Transportation Company, Inc.	1.25	Truck Carrier
M. Madic, Inc.	0.75	Truck Carrier
Mach 1 Global Services, Inc.	0.75	Truck Carrier
MacKinnon Transport Inc.	1.25	Truck Carrier
MacMillan-Piper, Inc	0.75	Truck Carrier
Magellan Transport Logistics	1.25	Logistics
Magnum Express, Inc.	1.25	Truck Carrier
Maine Motor Transport Association, Inc.		Affiliate
Malt-o-Meal		Shipper
Manna Freight Systems, Inc.	1.25	Logistics
Manwin Enterprises, Inc.		Affiliate
Marangoni Tread NA, Inc.		Shipper

 Marathon Cheese Transport, Inc.	1.25	Truck Carrier
Market Transport, Ltd.	1.25	Truck Carrier
Marten Transport, Ltd.	1.25	Truck Carrier
Martini, Inc.	1.25	Truck Carrier
Maryland Motor Truck Association		Affiliate
Massachusetts Motor Transportation Association		Affiliate
Massera Trucking, Inc.	0.75	Truck Carrier
Matson Integrated Logistics	1.25	Logistics
Matthew J. Buchanan	1.25	Truck Carrier
Mattel, Inc.		Shipper
Ma erick Transportation Inc.	0.75	Truck Carrier
Ma ric Trucking, Inc.	0.75	Truck Carrier
May Trucking Company	1.00	Truck Carrier
McCollister's Transportation	1.25	Truck Carrier
McConnell Transport Ltd.	1.25	Truck Carrier
McCoy Freightliner		Dealer/Service Center
McCracken Motor Freight	0.75	Truck Carrier
McElroy Truck Lines	0.75	Truck Carrier
McKelvey Trucking Company	1.25	Truck Carrier
McKimm Milk Transit, Inc.	1.00	Truck carrier
MCT Transportation, LLC	0.75	Truck Carrier
MeadWestvaco Corporation (MWV)		Shipper
MegatruX Transportation, Inc	0.75	Truck Carrier
Meijer	1.25	Truck Carrier
Melton Truck Lines, Inc.	0.75	Truck Carrier
Menlo Worldwide	1.25	Logistics
Menlo Worldwide - Sandston, VA	1.25	Truck Carrier
Mercer Transportation	1.25	Truck Carrier
Mesilla Valley Transportation	1.25	Truck Carrier
Metcalf Trucking, U.C	1.25	Truck Carrier
Method Products, Inc.		Shipper
Metro Film Express, Inc. - DBA Metro Express, Inc.	1.25	Truck Carrier
Metropolitan Trucking, Inc.	1.25	Truck Carrier
Meyer Trucking, Inc.	1.00	Truck Carrier
Michelin North America, Inc.		Shipper
Michigan Trucking Association		Affiliates
Mid South Transport	0.75	Truck Carrier
Midwest Express, Inc.	1.25	Truck Carrier
Midwest Shippers' Association		Affiliate

	Midwest Specialized Transportation, Inc.	1.25	Truck Carrier
	Mid-West Truckers Association, Inc.		Affiliate
	Mikade Delivery Service, Inc.	1.00	Truck Carrier
	Milan Express Co. Inc.	0.75	Carrier
	Mill Creek Motor Freight	1.25	Truck Carrier
	Milliken & Company	1.25	Truck Carrier
	Miller Gordon Truck Lines (DBA MG Truck Lines)	1.25	Truck Carrier
	Miller Trucking Service	1.00	Truck Carrier
	Millipore		Shipper
	Minnesota Agri-Growth Council		Affiliate
	Minnesota Grain and Feed Association		Affiliate
	Minnesota Trucking Association (MTA)		Affiliate
	Missouri Motor Carriers Association		Affiliate
	MLG Trucking, Inc.	1.25	Truck Carrier
	Modern Transportation Services	0.75	Truck Carrier
	Moeller Trucking, Inc.	1.25	Truck Carrier
	Mohawk Transportation of GA, LLC	0.75	Truck Carrier
	Monarch Air Express, Inc.	0.75	Truck Carrier
	Montana Peterbilt, LLC		Dealer/Service Center
	Monroe Career & Technical Institute		Affiliate
	<u>Morgan</u> Southern, Inc.	0.75	Truck Carrier
	Mountain Valley Express Co. Inc.	0.75	Truck Carrier
	Muir's Cartage Limited	0.75	Truck Carrier
	Mullen Trucking, LP	0.75	Truck Carrier
	MW Logistics, LLC	1.25	Logistics
	Myers Transport, Inc.	0.75	Truck Carrier
	Mystic Island Transport, Inc. (National Retail Systems, Inc.)	1.25	Truck Carrier
	Partners	Score	Type of Partner
	N. Yanke Transfer Ltd.	1.25	Truck Carrier
	Namco Transport Solutions	0.75	Truck Carrier
	National Biodiesel Board		Affiliate
	National Carriers, Inc.	0.75	Truck Carrier
	National Distributors Inc.	1.25	Truck Carrier
	National <u>Freight</u> , Inc.	1.25	Truck Carrier
	National Industrial Transportation League		Affiliate
	National Logistics <u>Management</u>	0.75	Logistics
	National Private Truck Council (NPTC)		Affiliate
	National Retail Transportation, Inc. (National Retail Systems, Inc.)	1.25	Truck Carrier

	National Tank Truck Carriers Association		Affiliate
	National Truckers Association		Affiliates
	Nationwide Express	1.25	Truck Carrier
	Navajo Express, Inc.	0.75	Truck Carrier
	NCI Group, Inc.	1.25	Truck Carrier
	NCS Logistics	1.25	Truck Carrier
	Nebraska Trucking Association		Affiliate
	Nestle Purina Pet Care		Shipper
	Nevada Motor Transport Association, Inc.		Affiliate
	New Breed Logistics	1.25	Logistics
	New Century <u>Transportation</u> , Inc.	1.25	Truck Carrier
	New Deal Logistics	0.75	Truck Carrier
	New England Motor Freight	1.25	Truck Carrier
	New <u>Jersey</u> Motor Truck Association		Affiliate
	New Legend, Inc.	1.25	Truck Carrier
	New Penn Motor Express, Inc.	1.25	Truck Carrier
	NEX Global Logistics	0.75	Truck Carrier
	Next Energy		Affiliate
	Nice-Pak Products, Inc.		Shipper
	Nightline Express, Inc.	0.75	Logistics
	<u>Nike</u> , Inc. (Charter Partner)		Shipper
	Nippon Express USA, Inc.	1.25	Truck Carrier
	Nonstop Delivery	1.25	Logistics
	Norco Corporation	1.25	Truck Carrier
	Norfolk Southern Corporation	1.25	Rail Carrier
	Norrenberns Truck Service (NOTS)	0.75	Truck Carrier
	North Central Texas Council of Governments (NCTCOG)		Affiliate
	North Dakota Motor Carrier Association		Affiliate
	NorthAmerican Transportation Association		Affiliate
	Northrop Grumman Corporation		Shipper/Carrier
	NorthShore Transportation Co., Inc.	1.00	Truck Carrier
	Northwest Food Products Transportation, U..C	0.75	Truck Carrier
	Nose Cone Manufacturing Co. Inc.		Affiliate
	NPE, Inc.	1.25	Truck Carrier
	Nu-Way Transportation Services, Inc.	0.75	Truck Carrier
	Nussbaum	1.25	Truck Carrier
	NVC Logistics Group	0.75	Logistics
	NYK Logistics (Americas), Inc.	1.25	Logistics
	Partners		Type of Partner

O&S <u>Trucking</u> , Inc.	1.25	Truck Carrier
Ocean Spray Cranberries, Inc.		Shipper
OCS Transport, Inc.	0.75	Truck Carrier
Office Depot, Inc.	0.75	Shipper/Carrier
Office Movers, Inc.	0.75	Truck Carrier
Ohio Environmental Council		Affiliate
Ohio Trucking Association		Affiliate
Oklahoma Trucking Association		Affiliate
Old Dominion Freight Line, Inc.	1.00	Truck Carrier
Old Dominion Truck Leasing, Inc.		Affiliate
Omega Trucking, Inc.	0.75	Truck Carrier
Omni Logistics, Inc.	0.75	Logistics
Online Transport, Inc.	1.00	Truck Carrier
Ontario <u>Trucking</u> Association (OTA)		Affiliate
Oregon Department of Environmental Quality, Air Quality—Financial Assistance & Economic Development		Affiliate
Oregon Trucking Associations, Inc.		Affiliate
Orlicks, Inc.	1.25	Truck Carrier
OSRAM Sylvania		Shipper
Owens <u>Corning</u>		Shipper
Owner-Operator Independent Drivers Association Inc. (OOIDA)		Affiliate
OX Brands, LLC. (Idlebuster)		Affiliate
Ozark Motor Lines, Inc.	0.75	Truck Carrier

Partners

	Score	Type of Partner
P.A.M. Transport, Inc.	1.25	Truck Carrier
PACCAR Leasing Company		Affiliate
Pacer Global Logistics	1.25	Logistics
Pacific American	1.25	Logistics
Pacific Harbor Line, Inc.	1.25	Rail Carrier
Paddock Solar, Inc.		Affiliate
Panasonic Corporation of North America		Shipper
Panther Expedited Services, Inc.	1.25	Truck Carrier
Paper Transport, Inc.	1.25	Truck Carrier
Parkway Transport, Inc.	1.25	Truck Carrier
Paschall Truck Lines Inc.	1.25	Truck Carrier
Patrick Transportation	1.25	Truck Carrier
Patriot Logistics, Inc.	0.75	Truck Carrier
Paystar Logistics, Inc.	1.00	Truck Carrier
Pegasus Logistics Group	0.75	Logistics





Pegasus Transportation, Inc.	1.25	Truck Carrier
Pella Corporation	1.25	Shipper/Carrier
Penner International	1.25	Truck Carrier
Pennsylvania Motor Truck Association		Affiliate
Penske Logistics, LLC	1.25	Truck Carrier
Penske Truck Leasing Co., LP		Affiliate
Penske Truck Rental	1.25	Truck Carrier
PepsiCo, Inc.		Shipper
Perdue Transportation, Inc.	1.25	Truck Carrier
Performance Team - Supply Chain Logistics	1.25	Logistics
Performance Trucking	1.25	Truck Carrier
Perkins Specialized Transportation	1.00	Truck Carrier
Pernod Ricard USA		Shipper
Peterbilt of Fargo, Inc.		Dealer/Service Center
Peterbilt of Fort Smith		Dealer/Service Center
Peterbilt of Las Vegas, Inc.		Dealer/Service Center
Peterbilt PacLease of Las Vegas		Dealer/Service Center
Peterbilt of Northern California		Dealer/Service Center
Peterbilt of Northern Kentucky		Dealer/Service center
Peterbilt of Springfield		Dealer/Service Center
Phoenix Industries, Inc.	1.00	Truck Carrier
Pier Trucking Corp.	0.75	Truck Carrier
Pilot Freight Services	1.25	Logistics
Pioneer Electronics (USA), Inc.		Shipper
Pitt Ohio Express, LLC	1.00	Truck Carrier
PJAX Freight System	0.75	Truck Carrier
Pleasant Trucking, Inc.	1.25	Truck Carrier
Pohl Transportation, Inc.	1.25	Truck Carrier
Pony Pack, Inc.		Affiliate
Pottle's Transportation, Inc.	1.25	Truck Carrier
Premier Transportation	1.00	Truck Carrier
Pressure Systems International, Inc.		Affiliate
Prestigious Carrier, Inc.	1.25	Truck Carrier
Pride Transport, Inc.	1.25	Truck Carrier
Primary Transportation Services, Inc.	1.00	Truck Carrier
PrimeSource FSE		Shipper
Prime, Inc.	1.25	Truck Carrier

Priority Transportation	1.25	Truck Carrier
Pro Logistics	0.75	Logistics
Project Professionals Group Pty. Ltd.		Affiliate
Puget Sound International, Inc.	1.00	Truck Carrier

Q**Partners**


 <u>Quad/Graphics, Inc.</u>		Truck Carrier
Qualcomm Incorporated		Shipper
Quantum Logistics, LLC	0.75	Truck Carrier
Quebecor World Logistics	1.25	Logistics
Quest Global, Inc.	1.25	Truck Carrier














R**Partners**






	Score	Type of Partner
R & M Trucking	1.00	Truck Carrier
R & R Cartage, Inc.	0.75	Truck Carrier
R&E Enterprises of Mankato, Inc.	0.75	Truck Carrier
R. E. Garrison Trucking Co.	1.25	Truck Carrier
R. E. West, Inc.	1.25	Truck Carrier
R.R. Donnelley & Sons Co.	1.25	Logistics
Radius Rail Logistics, LLC	1.25	Logistics
Raider Express	1.25	Truck Carrier
Railex LLC	1.25	Logistics
Rands Trucking, Inc.	1.00	Truck Carrier
Rapid Transfer Xpress	1.00	Truck Carrier
Raven Transport Co., Inc.	1.25	Truck Carrier
Ravens Trucking	1.25	Truck Carrier
Ready Trucking, Inc.	0.75	Truck Carrier
Refrigerated Food Express, Inc.	0.75	Non Asset Based Carrier
Regional Air Quality Council		Affiliate
Reid Landis		Affiliate
Retail Industry Leaders Association		Affiliate
Reynolds Group	1.25	Logistics
RFX, Inc.	0.75	Logistics
Richlite		Shipper
Richland Express Inc.	0.75	Truck Carrier
Richmond Pacific Railroad	1.25	Rail Carrier
Rigmaster Power Corp		Affiliate
Rinchem Company, Inc.	1.25	Truck Carrier
Risinger Bros. Transfer	0.75	Truck Carrier
Riverside Transport, Inc.	1.25	Truck Carrier






RM Logistic	0.75	Logistics
RMG Enterprises, Ltd.	1.00	Truck Carrier
Roadlink USA East	0.75	Truck Carrier
ROAR Logistics, Inc.	1.00	Logistics
Robert Bearden, Inc.	1.00	Truck Carrier
Rockwell Automation		Shipper
Roehl <u>Transport</u> , Inc.	1.25	Truck Carrier
Royal Freight, L.P.	0.75	Truck Carrier
Ronnie Dowdy Trucking	1.25	Truck Carrier
Ruan Transportation Management Systems Inc	1.25	Truck Carrier
Rumble Trucking & Logistics, Inc.	0.75	Truck Carrier
Rush Truck Centers		Dealer/Service Center
Rush Trucking	1.25	Truck Carrier
RWI Transportation LLC	1.00	Truck Carrier
Ryan Transportation Service, Inc.	0.75	Logistics
Ryder Integrated Logistics, Inc.	1.25	Logistics
Ryder Truck Rental, Inc.	0.75	Truck Carrier

Partners**Score Type of Partner**







S & H Trucking, Inc.	0.75	Truck Carrier
S.C. Johnson & Son, Inc.		Shipper
Sacramento Truck Center		Dealer/Service Center
Safari Freight	0.75	Truck Carrier
Safe <u>Handling</u> , Inc.	1.25	Truck Carrier
Safeway, Inc.	1.00	Truck Carrier
Sagebrush logistics, LLC	1.25	Truck Carrier
Saia Motor Freight	1.00	Truck Carrier
Salson Logistics, Inc.	1.25	Truck Carrier
Sammons Trucking	0.75	Truck Carrier
Saskatchewan Trucking Association		Affiliate
SB Trucking, LTD.	1.25	Truck Carrier
Scales Express Inc.	1.00	Truck Carrier
Schenker, Inc.	1.25	Logistics
Schering-Plough CHC		Shipper
Schneider Logistics	1.00	Logistics
Schneider National, Inc. (Charter Partner)	1.25	Truck Carrier
 Schwan's Logistics, LLC	1.25	Shipper/Carrier
Scranton Petro LP		Truck Stop
SDR Trucking, LLC	0.75	Truck Carrier









	Sea Star Line, LLC	0.75	Non Asset Based Carrier
	Select Express & Logistics	0.75	Truck Carrier
	Select Logistics Network, Inc.	0.75	Logistics
	Select Van and Storage	0.75	Truck Carrier
	Semi Express, Inc.	1.25	Truck Carrier
	Serpro, Inc.	0.75	Truck Carrier
	SGT 2000 Inc.	1.25	Truck Carrier
	<u>Sharp Electronics Corporation</u>		Shipper
	Sharp Freight Systems, Inc.	1.25	Logistics
	Shaw Transport, Inc.	0.75	Truck Carrier
	Sherwin Williams	1.25	Shipper/Carrier
	Shipper's Transport Co	1.25	Truck Carrier
	Shorepower Technologies		Shipper
	Siemens Transportation Group, Inc.	1.25	Truck Carrier
	Sierra Nevada Brewing Co.	1.25	Shipper/Carrier
	Silver Eagle Manufacturing Company		Affiliate
	Simply Green, a biofuels company, LLC.	1.00	Truck Carrier
	Sitton Motor Lines	1.25	Truck Carrier
	Sky Transportation Services, Inc.	1.25	Truck Carrier
	Skyline National, Inc.	1.00	Carrier
	SLH Transport Inc.	1.25	Truck Carrier
	Slingshot Transportation, Inc.	1.25	Truck Carrier
	Smith <u>Transport</u> , Inc.	1.25	Truck Carrier
	Smithfield <u>Transportation Co.</u> , Inc.	1.25	Truck Carrier
	Smithway Motor Xpress, Inc.	1.00	Truck Carrier
	SOLUS Solutions and Technologies, LLC		Affiliate
	Sony Electronics, Inc.	0.75	Shipper/Carrier
	South Carolina Trucking Association		Affiliate
	South Coast Transportation & Distribution	0.75	Truck Carrier
	South Shore Clean Cities, Inc.		Affiliate
	Southeast Environmental Task Force		Affiliate
	Southeastern <u>Freight Lines</u>	1.00	Truck Carrier
	Southern Cal Transport, Inc.	1.25	Truck Carrier
	Southern Refrigerated Transport, Inc.	1.25	Truck Carrier
	Southwest Detroit Environmental Vision (SDEV)		Affiliate
	Southwest Freight Lines	1.25	Truck Carrier
	Southwest Truck Service	0.00	Truck Carrier
	Space Coast Coalition		Affiliate
	Specialized Carriers & Rigging Association		Affiliate
	Specialized Services Transportation, Inc.	1.25	Truck Carrier

	Specialized Transportation, Inc.	1.25	Truck Carrier
	Spectrum Global Logistics, Inc.	1.25	Logistics
	Stagecoach Cartage & Distribution, L.P.	0.75	Truck Carrier
	Stan Koch & Sons Trucking	1.25	Truck Carrier
	Stapish Transportation Inc.	0.75	Truck Carrier
	Staples, Inc.		Shipper
	Star Class, Inc.		Affiliate
	Star Transport, Inc.	1.25	Truck Carrier
	Star Transportation, Inc.	0.75	Truck Carrier
	StarTrans, Inc.	0.75	Truck Carrier
	States Logistics	1.25	Truck Carrier
	Steadfast Transcontinent, Inc.	0.75	Truck Carrier
	Stephen Izzi Trucking & Rigging, Inc.	0.75	Truck Carrier
	STERIS Corporation		Shipper
	Stevens Transport	1.25	Truck Carrier
	Stonebroke Trucking, Inc.	0.75	Truck Carrier
	Stonyfield Farm, Inc.		Shipper
	Stop & Shop Supermarket Co.	1.25	Truck Carrier
	Strive Logistics, LLC	1.00	Logistics
	Styline Industries		Shipper
	Styline Transportation, Inc.	1.25	Truck Carrier
	Summit Trucking, Inc.	1.00	Truck Carrier
	Summitt Trucking, LLC	1.25	Truck Carrier
	Sun Power Technologies		Affiliate
	Sunbury Transport, Ltd.	0.75	Truck Carrier
	Sunteck Transport Group	0.75	Logistics
	Super Service Inc.	1.25	Truck Carrier
	Superior Financial Group		Affiliate
	Supreme Carriers, Inc.	1.00	Truck Carrier
	Swift <u>Transportation Co., Inc.</u> (Charter Partner)	1.25	Truck Carrier
	Synergistic Transportation, Inc.	0.75	Truck Carrier
	System Transport, Inc.	1.25	Truck Carrier
	Partners	Score	Type of Partner
	T. W. Transport	1.25	Truck Carrier
	Tacoma Rail	1.25	Rail Carrier
	Tandem Transport Corp.	1.25	Truck Carrier
	Tandet Dedicated, Inc.	0.75	Truck Carrier
	Tandet Logistics	1.00	Truck Carrier
	Tango Transport	1.00	Truck Carrier
	Target		Shipper

	Target Transportation	1.25	Logistics
	Tatung Company of America		Shipper
	Taylor Express, Inc.	1.00	Truck Carrier
	Taylor Truck Une, Inc.	1.25	Truck Carrier
	TCI Logistics, Inc.	0.75	Truck Carrier
	TCI Transportation Services	1.25	Truck Carrier
	TCSI-Transland, Inc.	1.00	Truck Carrier
	Team Logistics Systems, Inc.	1.25	Truck Carrier
	Teleflex Energy Power Systems		Affiliate
	Tennessee Department of Transportation (TDOT)		Affiliate
	Tennessee Department of Environment and Conservation		Affiliate
	Tennessee Trucking Association		Affiliate
	Terra Renewal Services	0.75	Truck Carrier
	Teton Transportation, Inc.	0.75	Truck Carrier
	Texas Commission on Environmental Quality (TCEQ)		
	Texas Land and Air	1.00	Truck Carrier
	Texas Motor Transportation Association (TMTA)		Affiliate
	Texas Southwest Transport, Ltd.	0.75	Truck Carrier
	Texas Star Express	1.00	Truck Carrier
	The BLM Group	1.25	Truck Carrier
	The Centre for Sustainable <u>Transportation</u>		Affiliate
	The Dannon Company		Shipper
	The Home <u>Depot</u> , Inc. (Charter Partner)		Shipper
	The Larson Group		Dealer/Service Center
	The Neutral Group		Affiliate
	The New York, Susquehanna, and Western Railway Corporation	1.25	Rail Carrier
	The Procter & Gamble Company		Shipper
	The RK Group		Logistics
	The Scotts Company		Truck Carrier
	The TJX Companies, Inc.		Shipper
	TheGreenOffice.com		Shipper
	Thomas E. Keller Trucking	1.00	Truck Carrier
	Tig Transportation	1.00	Truck Carrier
	<u>Tiger</u> Transport, LLC	1.25	Truck Carrier
	Tighe Trucking	0.75	Truck Carrier
	Time Warner Inc.		Shipper
	Titan Transfer, Inc.	1.25	Truck Carrier
	TLI Transportation, Inc.	1.25	Truck Carrier
	TMC Transportation	0.75	Truck Carrier

	Tommy Roach Transportation	1.25	Truck Carrier
	Toro Trucking	1.25	Truck Carrier
	Total Logistic Control, LLC	1.00	Logistics
	Total Quality, Inc.	1.25	Logistics
	Total Transportation of MS	1.25	Truck Carrier
	Total Transportation Services, Inc.	1.25	Logistics
	Total Transportation Services, LP	1.25	Logistics
	TOTO USA, Inc.		Shipper
	Towne Air Freight	0.75	Truck Carrier
	Toyota Logistics Services, Inc.		Shipper
	Trailer Bridge, Inc.	1.25	Truck Carrier
	Trailiner Corporation	1.25	Non Asset Based Carrier
	Trailwood Transport Ltd.	1.00	Truck Carrier
	Trailwood Transportation, Inc.	1.25	Truck Carrier
	Trans Technologies Company, Inc.		Affiliate
	Trans-Pro, Inc.	1.00	Truck Carrier
	TransAm Trucking, Inc.	1.25	Truck Carrier
	TransCarriers, Inc.	1.00	Truck Carrier
	Transco Lines, Inc.	1.00	Truck Carrier
	Trans-rit McNamara, Inc.	1.25	Truck Carrier
	Transgroup Worldwide Logistics	1.25	Logistics
	Transnational Logistics	1.25	Truck Carrier
	Transplace Texas, LP	1.25	Logistics
	Transport America	1.25	Truck Carrier
	Transport Couture & fils Itée	1.25	Truck Carrier
	Transport Designs, Inc.	1.00	Truck Carrier
	Transport Industries, L.P.	0.75	Truck Carrier
	Transport Robert LTEE	1.25	Truck Carrier
	Transport Solutions of America, LLC		Shipper
	Transportation Insight	1.25	Logistics
	Transportation Intermediaries Association		Affiliate
	Transportation Solutions Group, LLC	0.75	Logistics
	Transtex Composite, Inc.		Affiliate
	Transwood, Inc.	0.75	Truck Carrier
	Transvantage Transportation	0.75	Truck Carrier
	TransX Group of Companies	1.25	Truck Carrier
	Travelers Transportation Services	1.25	Truck Carrier
	Tridako Energy Systems		Affiliate
	Trigistix Warehousing & Distribution	1.25	Logistics

	Tri-Hi Transportation	1.25	Truck Carrier
	Tri-National, Inc.	1.25	Truck Carrier
	Trinity Transport, Inc.	0.75	Truck Carrier
	Trinity Transport, Inc. (Delaware)	0.75	Logistics
	Triple Crown Services	1.25	Truck Carrier
	Triple Decker Transport, Ltd.	1.25	Truck Carrier
	Triple T Transport, Inc.	0.75	Logistics
	Triways, Inc.	0.75	Truck Carrier
	Tri-State Truck Center, Inc.		Dealer/Service Center
	Truck Mate Generators		Affiliate
	Truck One, Inc.	0.00	Non Asset Based Carrier
	Truck Repair Service Center, Inc.		Dealer/Service Center
	Truck Service, Inc.	1.00	Truck Carrier
	Truckload Carriers Association		Affiliate
	TruckloadBroker.com, LLC	0.75	Logistics
	Truckmen Corporation	1.00	Truck Carrier
	Trucks Feed Our Families		Affiliate
	TrucksOnly.com		Affiliate
	Truline Corporation	1.25	Truck Carrier
	TRX Inc.	0.75	Non Asset Based Carrier
	TST Overland Express	1.00	Truck Carrier
	Tucker Company	0.75	Logistics
	Turning Point Trucking, LLC	1.00	Truck Carrier
	Two Cool Trucking Corp.	0.75	Truck Carrier
	Two Flags Transportation	1.25	Truck Carrier
	Two Men and A truck	1.25	Truck Carrier
	Twolane Customs, Inc.		Affiliate
	Tyson Foods, Inc.	1.25	Shipper/Carrier
	Partners	Score	Type of Partner
	U.S. Foodservice	1.25	Shipper/Carrier
	U.S. Inter-Mex Transportation, LLC	0.75	Truck Carrier
	Union Pacific Railroad	1.25	Rail Carrier
	United Natural Foods, Inc.	1.25	Truck Carrier
	United Road Services, Inc.	1.25	Truck Carrier
	United Stationers Supply Co.	0.75	Truck Carrier
	United Transportation Services, Inc.	0.75	Truck Carrier
	UPC, Inc.		Affiliate

 UPS (Charter Partner)	1.25	Truck Carrier
 UPS Freight	1.25	Truck Carrier
Urban Express	1.00	Non Asset Based Carrier
 <u>US Xpress Enterprises, Inc/Xpress Global Systems, Inc.</u>	1.25	Truck Carrier
 USA Logistics Carriers, LLC	1.25	Truck Carrier
 USA <u>Truck, Inc.</u>	1.25	Truck Carrier
 USF Companies	1.25	Truck Carrier
USG Corporation		Shipper
Utility Trailer Sales SE Texas, Inc.		
Partners	Score	Type of Partner
Value Truck, Inc.	0.00	Truck Carrier
Vancouver Organizing Committee for the 2010 Olympic and Paralympic Winter Games	0.75	Shipper/Carrier
Vertex Transport, LLC	0.75	Logistics
Veterans Messenger Service, Inc.	0.75	Logistics
 Victory Leasing	1.25	Truck Carrier
 Vitesse Trucking Services	1.25	Truck Carrier
Vitran Express, Inc.	0.75	Truck Carrier
VIVO Ventures		Shipper
Volume Transportation Inc.	0.00	Truck Carrier
Voluntary Interindustry Commerce Solutions (VICS)		Affiliate
Volvo Logistics North America		Shipper
Voyager Express, Inc.	0.75	Truck Carrier
VSR Logistics, Inc.	1.00	Truck Carrier
VTL Transport	1.25	Truck Carrier
Partners	Score	Type of Partner
W.J. Donovan, Inc.	1.25	Truck Carrier
Wagner Industries, Inc.	0.75	Truck Carrier
Walgreen Co.	1.00	Shipper/Carrier
Wal-Mart	1.25	Shipper/Carrier
Waller Truck Co., Inc.	1.25	Truck Carrier
Ward Transport and Logistics	1.00	Truck Carrier
Washington Trucking Associations, Inc.		Affiliate
Watkins & <u>Shepard Trucking, Inc.</u>	1.25	Truck Carrier
Watsontown Trucking Company	1.25	Truck Carrier
Webasto Products North America		Affiliate
Weber Distribution	1.25	Truck Carrier

WEL Companies, Inc.	1.25	Truck Carrier
Werner Enterprises, Inc.	1.25	Truck Carrier
West Motor Freight	0.75	Truck Carrier
West Side Transport	1.25	Truck Carrier
Western Canada Express, Inc.	1.25	Truck Carrier
Western Dist. Trans Corp	1.25	Truck Carrier
Western Express, Inc.	1.00	Truck Carrier
West-Northwest Trans. Inc.	1.00	Truck Carrier
Whirlpool Corporation		Shipper
Whiteline Express, Ltd.	0.75	Truck Carrier
Wiley Sanders Truck Lines, Inc.	0.75	Truck Carrier
Windyne, Inc.		Affiliate
Wisconsin Clean Cities-SE Area		Affiliate
Wisconsin Motor Carriers Association		Affiliate
Wisconsin Partners for Clean Air		Affiliate
Wooster Motor Ways, Inc.	1.00	Truck Carrier
WorldWide - ISCS	0.75	Logistics
WSE Transportation, LLC	1.25	Truck Carrier
Partners	Score	Type of Partner
XTL Transport Inc.	1.25	Truck Carrier
Partners	Score	Type of Partner
Yarmouth Lumber	1.00	Truck Carrier
Yokota International	1.25	Logistics
YOLO Colorhouse		Shipper
YRC Logistics	1.25	Logistics
YRC Worldwide Inc. (Charter Partner)	1.25	Truck Carrier



<http://www.epa.gov/smartway/transport/partner-resources/resources-faq.htm>
Last updated on Tuesday, August 19th, 2008.

SmartWay Transport

You are here: [EPA Home](#) [Transportation and Air Quality](#) [SmartWay Home](#) [SmartWay Transport](#)
[Partner Resources](#) [FAQs](#)



The Smart Way to Save Fuel,
Money, and the Environment

Partner Resources: Frequently Asked Questions

[Why Transport Partnership?](#)
[SmartWay Transport Partnership important?](#)
[Goals of the SmartWay Transport](#)

[Links to
resources](#)

[Frequently Asked
Questions](#)

[Tools and Models](#)

[Marketing and
Outreach](#)

[Logo Use
Guidelines](#)

[Awards and
Recognition](#)

[Publications and
Reports](#)

[Glossary](#)

[Resources by
Partner Type](#)

Questions for Potential Partners

- [Why should companies join the SmartWay Transport Partnership?](#)
- [Who can join the SmartWay Transport Partnership?](#)
- [How does a company join the SmartWay Transport Partnership?](#)
- [Are there costs associated with the SmartWay Transport Partnership?](#)

General Questions

What is [SmartWay Transport Partnership?](#)

The SmartWay Transport Partnership is an innovative collaboration between EPA and the freight industry. The Partnership creates strong market-based incentives that challenge companies to improve the environmental performance of their freight operations. SmartWay Transport partners improve their energy efficiency, save money, reduce greenhouse gas emissions, and improve air quality.

[Why is the SmartWay Transport Partnership important?](#)

Shipping goods is vital to the US economy. However, freight shipments have an environmental cost. Freight trucks and locomotives consume 35 billion gallons of diesel fuel each year, and burning this fuel produces over 350 million metric tons of carbon dioxide each year.

Current trends indicate that, by 2012, ground freight transportation will consume over 45 billion gallons of diesel fuel and produce over 450 million metric tons of carbon dioxide. These levels represent an increase of over 25 percent compared to today's levels.

The SmartWay Transport Partnership aims to significantly

reduce these emissions. By 2012, the Partnership will cut carbon dioxide (CO₂) emissions by 33 to 66 million metric tons per year, and oxides of nitrogen (NO_x) emissions by up to 200,000 tons per year. This will save the equivalent of up to 150 million barrels of oil per year. That's the same as removing up to 12 million cars from the road each year.

What are the goals of the SmartWay Transport Partnership?

The goals of the Partnership are to reduce:

- fuel consumption from trucks and rail delivering freight;
- operating costs associated with the delivery of freight;
- emissions of carbon dioxide, a greenhouse gas; and
- NO_x emissions and particulate matter, and air toxics that adversely affect air quality and contribute to health problems, especially in densely populated urban areas.

By 2012, the SmartWay Transport Partnership aims to save between 3.3 and 6.6 billion gallons of diesel fuel per year, which translates to eliminating at least 33 million metric tons of CO₂ emissions and up to 200,000 tons of NO_x emissions per year.

What is the ground freight industry's contribution to air pollution?

Ground freight is a significant source of emissions that create smog and other harmful air pollutants that lead to related health concerns, especially among the young and the elderly.

How does EPA calculate the benefits from this Partnership?

EPA developed the Freight Logistics Environmental and Energy Tracking (FLEET) Performance model to help individual fleets assess current efficiency, and quantify the environmental and cost-saving benefits of various technologies and practices. The FLEET Performance model provides baseline environmental performance data (CO₂ and other emissions) and is used to track improvements on an annual basis. EPA aggregates this information to calculate the overall environmental benefits of the Partnership.

Questions for Potential Partners

Why should companies join the SmartWay Transport Partnership?

The Partnership is attractive for many reasons. Companies with truck fleets save money while accessing new opportunities to retain and attract business, since participating shippers need participating carriers. Companies that don't have fleets but ship their goods through third-party carriers have the ability to address the impacts of a significant part of their supply chain and improve their environmental footprint in transportation.

The Partnership helps each Partner determine its environmental impact, set environmental stewardship goals, and track progress, which may be important to shareholders and customers. In addition, SmartWay works with all of its

Partners to expand awareness of the Partnership and to highlight their participation in it.

Who can join the SmartWay Transport Partnership?
Virtually any company that ships products or transports them can join the SmartWay Transport Partnership - from independent owner operators to large truck fleets; from big chain stores to small business owners. SmartWay Transport Partners are a true cross-section of America, working together to protect our natural resources and improve the economy. Become a partner now

How does a company join the SmartWay Transport Partnership?
Companies join by performing an environmental assessment of their freight operations and by committing to improve that performance within three years. The EPA will provide the needed tools and materials to help companies determine their current environmental performance and help develop their individual improvement targets. You can apply to become a partner online.

Are there costs associated with the SmartWay Transport Partnership?
The Partnership costs nothing to join. Partners determine their own improvement goals, based upon their business and environmental objectives. The costs of the strategies Partners may use to achieve their goals vary, although several strategies have no cost, or a low cost.

Even options with an initial cost generally "pay back" within two or three years, since fuel savings, in addition to lower maintenance costs and less vehicle downtime, are often substantial.



SmartWay Transport FAQs

What is SmartWaySM Transport?

SmartWay Transport is the U.S. Environmental Protection Agency's flagship program to increase the energy efficiency of the transportation system in order to reduce greenhouse gas emissions and air pollution. SmartWay Transport is comprised of six core components:

SmartWay Transport Partnership: A collaboration among freight shippers, carriers, and logistics companies to reduce environmental impacts.

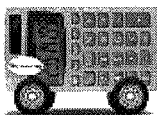
SmartWay Tractors and Trailers: A labeling and recognition program for tractors and trailers that meet the highest standards of environmental performance.

SmartWay Innovative Financing Program: A creative program that helps companies acquire fuel-efficient, low-pollution technologies through easier access to financial mechanisms such as reduced-interest loans with flexible terms.

SmartWay Technology Assessment: A testing and verification program designed to assess the environmental performance of vehicles, fuels, and products.

SmartWay Grow and Go: a program promoting the environmental benefits of renewable fuels.

SmartWay National Idle-Free Corridors Program: A strategic alliance designed to eliminate all unnecessary long-duration truck and locomotive idling at strategic points along major transportation corridors.



What is the environmental impact of ground freight transportation?

Delivery of goods by trucks and rail currently accounts for:

- 11 billion tons of goods moved;
- 35 billion gallons of diesel fuel consumed;
- 350 million metric tons of CO₂ generated; and
- 20 percent of all energy consumed by the transportation sector.

In addition, ground freight contributes about 40 percent of the nitrogen oxide (NO_x) emissions from transportation sources, accounts for approximately 31 percent of the particulate matter (PM) emissions from transportation sources, and is a major source of greenhouse gases, responsible for approximately 20 percent of carbon dioxide (CO₂) emissions from transportation sources.

Truck and locomotive idling consumes over 1 billion gallons of diesel fuel per year and emits 11 million tons of CO₂, 200,000 tons of NO_x and 5,000 tons of PM each year. A typical long-haul combination truck could idle up to 2,400 hours per year, using over 1,900 gallons of fuel.

What is the SmartWay Transport Partnership?

The SmartWay Transport Partnership, introduced on February 9, 2004, is an innovative collaboration between the U.S. Environmental Protection Agency and the freight industry designed to implement creative approaches to reducing the energy and environmental impact of transport. The Partnership currently focuses on freight (e.g., truck, rail, and marine) transport.

What are the goals of the Partnership?

The goals of the SmartWay Transport Partnership are to increase the use of fuel efficiency technologies and strategies that lower emissions and reduce adverse environmental impacts while helping freight companies save money. Specifically, the Partnership lowers emissions of carbon dioxide (CO₂), nitrogen oxides (NO_x), particulate matter (PM) and greenhouse gases.

By 2012, SmartWay Partners could save between 3.3 and 6.6 billion gallons of fuel per year (equivalent to 150 million barrels of oil or 12 million cars off the road).

Who can participate in the Partnership?

Any company involved with freight transport can join the Partnership at no cost, including:

Shippers: companies that manufacture or sell merchandise and ship those goods to distribution centers or retail facilities.

Carriers: companies that own and operate freight trucks or locomotives that are hired to transport materials or merchandise; these include truck and rail companies as well as "shipper-carriers"—companies that ship their merchandise using their own private fleets.

Logistics Companies: companies that are hired to facilitate the packaging and shipping of goods.

Truck Stops/ Travel Plazas: facilities designed to provide rest and refueling areas for truck drivers

Affiliates: organizations and companies that promote the goals and benefits of SmartWay and encourage participation.

What does it mean to be a SmartWay Transport Partner?

Companies that join the SmartWay Transport Partnership commit to:

Assess the environmental performance of their current operations using EPA's Freight Logistics Environmental and Energy Tracking (FLEET) Performance Models;

Identify a three-year goal to improve their environmental performance;

Develop a plan detailing how the goal will be achieved; and

Report their progress annually to EPA.

How do Partners reduce fuel consumption and emissions?

Carriers commit to integrate cost-saving, fuel-efficient technologies and strategies such as:

Idle reduction

Improved aerodynamics

Improved freight logistics

Automatic tire inflation systems

Fuel-efficient driver training

Renewable fuels

Advanced lubricants

Advanced powertrain technologies

Low-rolling resistant tires

Shippers commit to use SmartWay carriers, and can modify their facilities and trailers to improve efficiency and reduce emissions:

Intermodal shipping

Pick-up and delivery scheduling

Full truck loads

Preferential docking

Warehouse improvements

Electric forklifts

Driver comfort stations

Idle reduction at docks

Improved aerodynamics and tires on trailers

What are the benefits of joining the Partnership?

Here are just some of the ways participating in the SmartWay Transport Partnership can benefit companies and organizations:

Savings from reduced fuel consumption;

Assistance in assessing environmental impact;

Use of the SmartWay Transport Partner logo in corporate communications (by qualified partners); and

Awards, publicity, and recognition for environmentally responsible behaviors.

How many companies and organizations have joined the Partnership?

As of August, 2007, there are nearly 600 SmartWay Transport Partners, operating 300,000 freight trucks and 500,000 trailers.

What is SmartWay Grow & Go?

SmartWay Grow & Go is a program developed to promote the environmental benefits of renewable fuels. The program will support the administration's goal of reducing U.S. dependency on foreign oil and help improve our environment.

What are the goals of SmartWay Grow & Go?

By working with our current and prospective SmartWay Transport partners, the **SmartWay Grow & Go program** aims to promote the environmental benefits of renewable fuels. By 2012, EPA's goal is to have 25 percent of our SmartWay Partners committed to using renewable fuels, and by 2020 to have 50 percent of our partners committed to using renewable fuels.

Through SmartWay Grow & Go, EPA and its partners will expand technical information about renewable fuels (specifically E85 and biodiesel) and increase public awareness of their environmental benefits. In addition, EPA will work with our federal partners and others to clarify and streamline the regulatory framework, which will remove barriers to the increased use of quality renewable fuels.



SmartWay Transport Overview

What are the goals of SmartWay Transport?

SmartWay Transport aims to increase the availability and market penetration of fuel efficiency technologies and strategies that help freight companies save money while also reducing adverse environmental impacts.

Specifically, SmartWay Transport programs lower emissions of carbon dioxide (CO₂), nitrogen oxides (NO_x), and particulate matter (PM).

By 2012, SmartWay partners will help save between 3.3 and 6.6 billion gallons of fuel per year (equivalent to 150 million barrels of oil or 12 million cars off the road).



SmartWay Transport is the US Environmental Protection Agency's flagship program for improving fuel efficiency and reducing greenhouse gases and air pollution from the freight transportation industry. This innovative collaboration, launched in 2004, is comprised of partnerships, financial incentives, policy and technical solutions, and research and evaluation projects that find new ways to optimize the transportation networks in a company's supply chain. Endorsed by major freight industry associations, companies, and trade publications, SmartWay Transport is leading the way to greater fuel efficiency and lower emissions from the freight sector, while presenting a model of government and industry cooperation for public and private benefits.

SmartWay Transport Partnership is a strong government/industry collaboration between freight shippers, carriers, and logistics companies to voluntarily achieve improved fuel efficiency and reduce environmental impacts from freight transport. Participating companies benchmark their current freight operations, identify technologies and strategies to reduce their carbon emissions, track emissions reductions and project future improvement. SmartWay partners demonstrate to customers, clients, and investors that they are taking responsibility for the emissions associated with goods movement, are committed to corporate social responsibility and sustainable business practices, and are reducing their carbon footprint. To date, the partnership includes 1,000 companies and associations committed to improving fuel efficiency.

SmartWay Tractors and Trailers meet new voluntary equipment specifications that can reduce fuel consumption by 10 to 20 percent for 2007 long-haul tractors and trailers. Each qualified tractor/trailer combination can save between 2,000 to 4,000 gallons of diesel per year. Models that meet these equipment specifications save operators money and reduce greenhouse gas emissions and air pollutants.

SmartWay Innovative Finance helps companies and individuals acquire fuel-efficient emission reduction technologies—clean trucks—through easier access to multiple financial institutions. As a result, individuals and companies will have access to reduced-interest loans with flexible terms. These financial institutions are consolidated into one web based clearinghouse located at www.SmartWayFinanceCenter.com.

SmartWay Technology Assessment is a testing and verification program designed to quantify emissions reductions and fuel savings from various available technologies, such as tractor and trailer aerodynamics, auxiliary power units, and wide-based tires. As a result, companies can compare the fuel efficiency and environmental performance of various technologies and make more informed purchases.

SmartWay National Idle Free Corridors Program is a collaboration between federal, state, and local government, industry, and other organizations committed to eliminating all unnecessary long-duration truck and locomotive idling along major transportation corridors.

For more information <http://www.epa.gov/smartway/> or call 734-214-4767.

Appendix E:

Fleet Summaries

Appendix E: Fleet Summaries

Summary of Phone Meeting with B & B Trucking, Inc.

Phone meeting with Andrew Blackburn, Director of Equipment & Property, on 8/13/08.

- General fleet information:
 - a 150-180 tractors coast to coast
 - a 115 trailers (because use trailers from USPS pool some of the time)
 - a primarily haul mail for USPS (85-90% of business)
 - a trailer fleet comprised of approx 30% 48' and 70% 53' trailers
 - a they generally keep their trailers about 12-13 years
 - a generally keep tractors about 8-9 years (1.5 million miles), then sell them
 - a generally do not operate in CA (purposely stay out of CA)
- Aerodynamic equipment:
 - a have been using tank skirts on tractors since 1999 and seen decent results (benefits vary by speed of travel which varies by state)
 - have seen at least a 0.1 mpg savings at 65 mph
 - have not had any weather related problems with the tank' skirts, even when travel to Seattle
 - a Current Freight Wing equipment on trailers:
 - have been using the Freight Wing skirts on trailers for 1.5 years
 - 10 skirts, all on 53' trailers - the original aluminum product
 - Price: got grant for original purchases which made them very attractive
 - Installation: Freight Wing helped with installation & trained their people to install. Once trained, took one person about 2 hours per trailer
 - a New Freight Wing equipment
 - just ordered 20 more, some for 48' trailers & some for 53' trailers (10 for new trailers & 10 for retrofits)
 - planning to purchase the polymer plastic version (can go lower to the ground)
 - Price: <\$1000 per trailer (not including installation)
 - Plan to install on entire fleet eventually (gradually, for cost reasons)
- Maintenance & Repair issues:
 - a only one inCident of damage due to driver error - driver drove into a snow bank
 - damage was easily repaired, everything remained intact & drivable, no road hazard
 - ordered replacement panels which arrived in 3 days and easily replaced them in shop

- o no reported damage caused by snow - said less snow buildup under the trailer with the skirts than without them
- Fuel Economy:
 - o tested two trailers on same route between So. Carolina and Florida, using same two drivers, over two month period. Then they changed trailers, kept everything else the same, and compared results
 - o saw improvement in fuel economy - 0.3 mpg savings at 70 mph speeds
 - o retested at lower speed and saw 0.1-0.14 mpg savings at 55-60 mph
 - o base tractor fuel economy with single (raised) axle: 8-8.4 mpg, and with two live axles: 7.4-7.7 mpg
- Tires:
 - o currently using some SmartWay approved duals & some single wides - not seeing a great difference (using Bridgestone, Michelin & Yokohama)
 - o they are working with Michelin on single-wides

Summary of Telephone Meeting with Cascades Transport Inc. on 9/9/08

- Company/fleet information
 - o Met with Alain Boutin, Directeur gestion des risques et conformite
 - o Cascades is a major producer of paper, specializing in recycled content products
 - o Fleet travels throughout Canada & into US, primarily to the Midwest and East (do not come to California directly - use subcontractors)
 - o Fleet consists of 100 tractors & 550 trailers (mostly 53' & 48')
 - All but 12 of the trailers are dry vans
 - ~400 are 53' dry vans
 - Operate 2-, 3- and 4-axle trailers
 - o Lifespan of tractors & trailers:
 - Keep tractors about 10-12 years
 - Long haul tractors travel about 160,000 miles per year
 - Local haul travel about 124,000 miles per year
 - Keep trailers about 10-15 years
 - After about 10 years use them as yard trailers or for short distance (~ 20 mile radius)
 - o Average load weights:
 - 2-axle - 35,000 lbs
 - 3-axle - 70,000 lbs
 - 4-axle - 80,000 lbs
 - o Cascades is SmartWay partner for the last 2-3 years (one of first Canadian companies to join)
- Aerodynamic Equipment

- o On Tractors: fuel tank fairings, cab fairing, aerodynamic mirrors, winter heaters
- o On Trailers: currently using skirts - mostly Transtex Composite product
 - Originally tested 6 skirts for about 1 year, including Freight Wing (aluminum), Transtex skirt & a few months ago also tested a Laydon skirt
 - Tested with 2 dedicated runs with similar loads; monitored for 4-5 months, with and without skirts
 - Found Transtex product the best in winter & in case of accident (flexibility) & also wanted to support a Canadian company
 - Recently purchased 250 Transtex skirts, & have already installed 175 of them
 - Using skirts on 53' and 48' trailers; will be putting some on spread axle trailers and testing their effectiveness this fall
- o Other devices have tried/tested in the past:
 - Strakes on side of trailer - did not find fuel economy improvement (in fact, saw a 1% increase in fuel consumption with them)
 - Boat tail in back, by Transtex - tried them a couple of years ago - worked well but did not expand use
 - Bubble on trailer back - tried them about 7-10 years ago when **fuel** economy was not so significant a factor
- o Why have they been testing & using aerodynamic devices for as long as they have?
 - Fuel economy
 - Cascades is an environmental company (make 100% recycled content paper products & have been making them for some time) - all divisions are required to conserve energy
- Fuel Economy
 - o Initially tested 5 skirts (Freight Wing & Transtex) on 2 dedicated runs with similar loads
 - Monitored for 4-5 months, with and without skirts (in fall, winter & spring)
 - Saw 5.8% **fuel** savings (regardless of brand)
 - o Average fuel economy= 7.9 mpg (American)
- Driver reactions/comments:
 - o Skirts result in less spray being created along the side of the trailer, which improves visibility in wet weather
 - o Safety/stability
- Installation
 - o Initially took 3 people an entire day to install
 - o Now takes 4 people 2 ½ hours (32 hours for 4 trailers)

- Cost
 - o Approximate cost \$1500-\$2000 (Canadian) for various skirts (would not state how much they paid for current skirts)
 - o ROJ: estimate about 1 ½ years because of 5:1 trailer:tractor ratio
- Maintenance/Damage
 - o No damage to any of them at all (aluminum or composite)
 - o No maintenance so far
 - o Problems with steep loading docks and skirts?
 - Avoid using skirts where the incline is too steep - don't send them to those locations, or unload some other way
 - Found Transtex skirts the most pliable because they don't break easily & they rebound back into place after being bent
- Tires
 - o Have been using low profile tires for many years
 - o Do not use SmartWay approved tires because need more traction for winter road conditions
 - o Also have 15 units with super singles
 - Believe they provide better fuel economy, but need special permit to use them in Quebec & the cost of the permit negates the savings due to fuel savings (reason why Quebec charges for the permit is because of additional road damage)
- Other fuel savings activities/devices:
 - o Electronic speed control
 - Set pedal maximum speed at 108 km/hr
 - Set cruise control maximum speed at 105 km/hr
 - Control pedal use to less than 10% of the time
 - o Battery operated refrigeration system (tried Webasto, then Red Tech)
 - o Prevent idling (trucks shut down after 3 minutes of idling)

• **Summary of Telephone Meeting with Falcon Transport**

Summary of phone meeting on 8/12/08 with Falcon Transport to discuss their experience with Freight Wing equipment. In attendance were Mark Guthrie (Director of Operations) and Jason Meyers (Fuel Analyst).

- Company/fleet details:
 - o Headquartered in Youngstown, Ohio - operate primarily from Texas to the east coast
 - o Fleet comprised of about 2600 trailers, and 1050 tractors (700 that they own plus 350 owner/operators)
 - almost all trailers are 53' box type, and no refers (only pull refers for Walmart on holidays)
 - o Drivers include large proportion of trainees each year (train about 600/yr), who are hard on equipment

- o company currently spends \$60 million per year on diesel fuel (purchase ~ 1.8 million gallons/month)
 - o company recently applied to be SmartWay Partner
- Falcon purchased 6 Freight Wing belly fairings in the Spring of 2006; 5 are still in use, and one is not because it was installed on a trailer that was retired.
 - o no damage reported to any of the fairings over the two years, even with trainees
 - o no maintenance issues - felt that drivers were more conscious of them and therefore more careful
 - o tracked fuel savings during first 6 months of use (run 2417): about 0.6 mpg improvement, or 10%
 - o stopped tracking fuel costs when cost of fuel went down; now tracking again
 - o other benefits of fairings:
 - tires wore less
 - tracking was more true
 - easier to handle on a windy day than without fairings
 - helped reduce overspray of tires during rain
- How use the fairings?
 - o on long haul runs - avoid short term shuttles
 - o speed set at 65 mph (feel no benefit until exceed 55 mph)
- Future use of fairings:
 - o currently looking at a new technology manufactured by a CA company (Silver Eagle Mfg) out of San Jose. Contact person is Gary Gaussoin (503) 335-2114 (company actually located in Portland Oregon)
 - interested in their wakeboard on tail of trailer & skirts
 - using their wings now & seen a 15-20% improvement over the past month
 - haven't yet tested the wakeboard
 - o probably will put Silver Eagle equipment on all long haul fleet
- Tires:
 - o not in favor of super singles because:
 - cost (outweighs fuel savings)
 - breakdown/replacement difficulties
 - aggressive drivers
- Other ways to achieve fuel economy:
 - o driver training - believe driver behavior has 30% influence on fuel economy
 - o speed governing (set at 65 mph)
 - o other aerodynamic modifications currently using:
 - run batwings on tractor
 - bring trailer as close to tractor as possible
- Additional questions to be answered (sent follow up email):

- o was 10% improvement in fuel economy for skirts only, or with other modifications?
- o why didn't they expand the use of the Freight Wing products if saved so much (10% of \$60 million)?
- o why are they looking at the Silver Eagle, which they have barely tested, if their Freight Wing experience was so positive?

Summary of Telephone Meeting with Hiner Transport

Summary of Telephone Meeting with Paul James of Hiner Transport
August 21 , 2008

- Company/fleet information
 - o Company is a dry van carrier for over 41 years, located in Indiana
 - o Primarily service the Midwest to the east coast, but also have some dedicated trucks that travel to California regularly (about twice a week)
 - Designated California fleet already equipped with skirts - all on 48' trailers (requested due to tight turns)
 - o Fleet:
 - 200 tractors, 98% with sleeper cabs
 - 565 trailers (of the trailers, 545 are 53'ers, 20 are 48'ers)
 - Average age of tractors = 1.8 years (oldest in fleet is a 2004)
 - Average age of trailers = 3.6 years
 - Average annual miles driven:
 - Tractors: 135,000 mpy
 - Trailers: normal operation is 40,000-60,000 mpy
 - o Just now working on becoming SmartWay certified, although have been doing a lot of the required improvements for awhile
- Aerodynamic Equipment
 - o Have 15 Freight Wing skirts which got for half price (through a grant); have had them for approximately 2 years
 - All skirts are installed on dedicated long haul fleet on 48' trailers, because that dedicated fleet must negotiate
 - o When first investigated skirts, considered Transtex Composite as well as Freight Wing; but decided Freight Wing was the better choice at the time
 - o Tractor aerodynamic equipment
 - All have cab fairing, side fairings,
 - About half have tank fairings - due to cost (maintenance on tank fairings is expensive - \$400-\$600 to repair them, so lose benefit of fuel savings)
 - Have never used gap fairings or nose cones because not sure they "do the job"
 - o Boat tails
 - Don't believe they are effective
 - Inefficient for loading & unloading

- - Shippers/receivers who may load or unload may cause damage because they are not familiar with the equipment
- Future use of fairings - would love to install them on all trailers, but the cost of fuel is eating up capital so can't afford it at this time
- Fuel economy estimates
 - Fleet average is currently about 7 mpg (used to be 6.38-6.4 mpg), taking into account all improvements
 - Have seen a 0.2 mpg improvement due to skirts
 - Have seen a 0.4 mpg improvement due to super single tires
 - Idling restrictions add more improvement
 - Driver behavior major contributor - offer fuel conservation bonus to drivers who increase fuel economy & extra training to those who do not
- Other ways achieve fuel savings
 - Super singles on 75-80% of fleet
 - Aluminum wheels
 - Set truck speeds at 65 mph (reduced it from 68 mph 2 years ago)
 - 80% have idle control
- Installation
 - Freight Wing helped them install the skirts
 - Estimated it took about 8 hours or more to install on one trailer
 - Estimated it took 2-3 hours to install/replace a panel
- Costs
 - Would not specify an exact cost; first said skirts cost more than \$1500 per trailer, and later said costs were about \$1800-\$2000 per trailer
- Damage/Repair issues
 - They have had some damage problems and had to replace panels on three of the skirts
 - One situation was driver error
 - Most problems were associated with steep ramps, detours and construction zones
 - When there was damage; in one case the driver was able to return without any problems, while in the others they had to cut off the portion of the skirt with tin snips (because it was hanging/flapping) so that it would not cause damage
 - No problems with pieces flying off were experienced
 - Getting replacement panels was not a problem because Freight Wing gave them some extra panels
- Driver comments: initially drivers said the tractor and trailer handled better with the skirts
- Tires
 - Use super singles on 75-80% of trailer fleet - more fuel efficient
 - All other tires are low pro tires
 - Super singles primarily used on tractors, but they have been testing them on 50 trailers

- But drivers complain that when they turn corners they have difficulty seeing the tires (being able to see the tires helps them to turn safely)
- o Have had 5 flats with super singles on the road so far, and in all cases the situation was taken care of within 2 ½ hours (Michelin & Bridgestone have very good service)
 - With flats it is important to shut down the vehicle, so you don't damage the wheel
- o Tire life:
 - 250,000-260,000 miles for drive tires
 - 110,000-115,000 miles for steer tires
- o Use auto tire inflation system (some tires have lasted 320,000 miles due to tire monitoring & proper inflation) with all new tires
- o Recaps:
 - Tractor drive tires: 1-2 recaps
 - Super singles: 1 recap only
 - Trailer tires: maximum 2 recaps
 - Cost to recap: approximately \$82 per tire

Additional comments (submitted in writing):

- how cost prohibitive this program is due to the number of trailers that would have to have the modification and most carriers would decide not to service California due to the costs. It would also cause customers to abandon the CA market and their customers due to carriers not willing or being able to run those lanes cost effectively.
- most of these devices are not cost effective and do not provide the savings unless the trucks are moving over 40/45 miles per hour.
- unless trailers travel more than 80,000 miles per year, the savings these devices create, never really materialize over a long period of time, perhaps 5 or more years.

Summary of Telephone Meeting with Hy-Vee Foods
9/9/08

- Company/Fleet information
 - o Spoke with Jim Moore of Hy-Vee Foods
 - o Company is a major food retailer headquartered in Iowa, serving a 7-state area in the Midwest
 - 232 retail outlets
 - 60% backhaul, and also some contract freight hauling
 - o 125 tractors (all day cabs)
 - Average 142,000 miles/year
 - o 275 trailers (all 53'ers)
 - 185 reefers
 - 90 dry vans
 - o Average round trip = 408 miles
 - Many interstate trips, 800 loads/week

- 100-110 overnights (drivers stay in motels)
- Aerodynamic equipment
 - o All tractors have aerodynamic modifications (side fairings, roof fairings)
 - o Trailers:
 - Originally started testing 5 skirts last May
 - Using Silver Eagle skirts & air talons/strakes (on sides of trailer)
 - In July retrofitted 50 trailers with skirts & strakes
 - Benefits of Silver Eagle double walled skirts:
 - keep clearance to 20" to prevent damage with steep inclines
 - lightweight - all aluminum
 - o Converted some tires to super singles
- Fuel economy:
 - o
- Costs: paid about \$1900 per trailer
 - o Estimated ROI: 9-12 months, with 2:1 trailer:tractor ratio (includes both skirts and strakes)
 - o Cost to replace skirt panels: \$290 to replace 2 panels
- Other modifications to improve fuel economy:
 - o Speed governing
 - Began 8/1/08 lowered maximum from 70 mph to 65 mph
 - Average speed 57 mph with speed governed at 70 mph
 - Average speed less than 56 mph with speed governed at 65 mph
- Tires
 - o Began testing Michelin (X-1's) super singles about 3 years ago
 - Saw 0.24-0.25 mpg improvement in fuel economy with the tires

Summary of Telephone Meeting with Quest Global, Inc.

Summary of Meeting on 8/18/08 with Quest Global Shop Foreman, Mike McFarland. The company is located in Georgia

- Fleet information
 - o Company has more than 150 tractors and about 238 trailers - all are 53' reefers
 - o Their current tractors are all fully aerodynamic; all are sleepers
 - Mostly had Freightliner Columbia, but now switching to Volvo
 - Their tractors average 25,000-30,000 miles per month (use team drivers)
 - o Trailers made by Wabash
 - o Keep their trailers about 3-4 years, then sell them (try to keep everything within warranty)

- Plan to remove the skirts and re-install on new trailers when upgrade
- Aerodynamic equipment
 - o Began installing Laydon trailer skirts at the end of 2007
 - o 75% of all their trailers are currently installed with skirts
 - o Their skirts are comprised of 8-10 panels per side
 - o Continuing to retrofit about 3 trailers per week
 - o Only use Laydon product, and not sure why the company owner selected them over Freight Wing or others
 - o Down side of skirts:
 - Adds 200-250 lbs to the load
 - CA bridge law requires them to set their skirts and axles to comply with CA, rather than having to remove the skirts to bridge out when get to CA
- Estimated fuel savings
 - o When initially tested the product, saw savings of about 1/8 mile per gallon (12.5%)
- Maintenance/Repair issues
 - o Have not experienced many problems with the skirts - estimated about 5 problems since installation, some of them due to driver error
 - Minimal damage to the skirts, where nothing became detached, and driver was able to secure the skirts until they could get to a repair facility
 - Repaired by replacing panels
 - o Winter - some drivers complain about some ice buildup, but they say they can just kick it off
- Costs: \$1400-\$1500 per trailer
- Benefits of skirts:
 - o Fuel savings
 - o Driver feedback indicates vehicles track better in the wind with skirts
 - o No benefits to refer seen with skirting
- Tires
 - o Do not use low rolling resistance tires - only regular, low pro tires. They looked at SmartWay approved tires, but since they lease their tractor tires from Bridgestone, they only pay for miles driven
 - Looked at super singles, but have not been convinced that the benefits outweigh the costs
 - Have changed from 14 ply to 16 ply tires
 - o Recap the trailer tires
 - Recaps cost them about \$94 per tire
 - o They have been using auto inflation on their tires for more than 2 years; pros & cons of them:
 - Pro: improved tire maintenance, but

- Con: sometimes drivers continue driving on them when they should stop - resulting in more damage
- Steer tires get between 120,000 & 200,000 miles

Summary of Telephone Meeting with Twin City Transportation, Inc.

Staff met by telephone with Herb Martin, President of Twin City Transportation on 9/3/08

- Company/fleet information:
 - Headquartered in Little Rock, Arkansas, operate in all 48 states
 - Defines his company as a "small carrier"
 - 65 trucks: 40 pulling dry vans & 25 pulling flat beds
 - All sleeper cabs
 - Ratio of trailers to tractors:
 - Dry vans 3:1
 - Flat beds: 1:1
 - Drivers: ½ are independent owner-operators; ½ are company employees
 - Average age of tractors 5 years (only purchase used - currently looking at 2006's)
 - Average age of trailers: 7 years (always buy new)
 - Currently applying to be a SmartWay member
- Aerodynamic devices:
 - Purchased 20 Freight Wing skirts 2 years ago - pleased with them and plan to purchase more - will put on new trailers
 - Have the original aluminum devices
 - Had not investigated the newer, plastic skirts
 - Also tried Air Tabs - did not see any benefit with them
- Costs of skirts: approximately \$2000 for the aluminum skirts
- ROI: estimated less than 3 years
- Fuel economy:
 - Average fuel economy 6.6 mpg
 - Have seen a 0.1-0.2 mpg improvement with the skirts
 - Use engine governing, mostly at 65 mph (& 5 @ 70 mph)
- Damage/Maintenance:
 - He did not have exact damage data, but estimated that at least 5 of the skirts had gotten damaged to the point of needing to replace a panel
 - Sometimes damage could be easily repaired
 - Twice the damage to the skirts was severe enough that the driver worried that friction might cause a piece to break off, so they stopped to repair it before proceeding
 - Reasons for damage: (some driver error, some unavoidable accidents)
 - ½ the time the driver hit something on the road

- ½ the time damage caused by going over a high center (docks, railroad tracks)
 - Solution: train drivers to be more careful & avoid circumstances with extreme conditions
 - Weather/snow concerns: have driven the skirts through winter conditions & have never had a problem with snow
- Installation:
 - Freight Wing did 15 of the installations, Twin City did 5
 - Freight Wing can install them in about 2 ½ person hours
- Driver reactions to skirts:
 - Owner-operators like the skirts because they save fuel
 - Employee operators also like the skirts
 - Some have commented that they feel more stable in a crosswind
- Tires:
 - Just a few months ago began using low rolling resistance (LRR) tires on 3 trailers
 - Plan to convert all tractors & trailers to LRR tires
 - Will not try super singles because heard from other fleets about problems with repairs, and most of his loads are time sensitive
 - Tire life:
 - Tractor tires: 70,000-150,000 miles
 - Trailer tires: 15-24 months (track age, not mileage)- estimate at least 80,000 miles

Summary of Telephone Meeting with Normandin Transit 9/3/08.

- Staff spoke by telephone with Daniel Pascau, Fleet Manager
- Company information
 - General freight company for 20 years
 - Located near Montreal
 - Company is not a SmartWay partner - has been doing SmartWay approved modifications before SmartWay was developed, but they have not been pleased with how EPA/SmartWay handles things
 - As a company, want to utilize as many aerodynamic devices as possible to maximize fuel economy
- Fleet:
 - 255 tractors - entire fleet are Kenworth
 - Have 8 new T660's (SmartWay certified)
 - 500 trailers
 - 50 reefers
 - 65 heated trailers
 - 385 53' dry vans
 - Lifespan:
 - Keep tractors 4-4 ½ years

- Miles per year on tractors: ~135,000
 - Keep trailers 10-12 years (some even longer)
 - Miles per year on trailers: -80,000-95,000
 - Miles per year on reefers: 125,000
- Fuel economy:
 - o Average mileage for fleet: 7.3 mpg (although some get 8.4 mpg)
 - o Fuel economy achieved with skirts:
 - 5%-6% with aluminum skirts on reefers
 - 7%-8% (sometimes 10%) with new reefers & new skirts
 - o Strategies for improving fuel economy:
 - Aerodynamic on tractors
 - Low rolling resistance tires (have been buying according to rolling resistance for a long time) & super single tires
 - Lightweight rims
 - Nitrogen inflated tires
 - Skirts
 - Proactive driver training and follow up
 - Speed governed to not exceed 65 mph
 - APU's
- Trailer aerodynamics:
 - o History:
 - First tried un-named **front** end modification that didn't work
 - Began prototyping to build their own devices
 - Began using Freight Wing skirts in July 2007
 - Began with 10 skirts, now have ordered 30 more
 - o First priority is to install skirts on all reefers, then on box-type trailers
 - o Freight Wing products used:
 - 1st used Low Rider - aluminum with 6" rubber at the bottom for fleXibility
 - Now using/ordering Aeroflex Belly Fairing - called it "the most perfect product" - put the first one in 2 months ago
 - o Transtex Composite skirt:
 - Have one in fleet
 - Considered a "good product," but does not like the rigidity at the bottom (results in scraping of the bottom causing damage)
 - o AT Dynamics Boat Tail - never tried it but has strong concern about safety & possible damage to it when backing up
- Installation
 - o Freight Wing did initial installations & trained their people to do them
 - o Initially took Normandin staff 5 ½ hours & 4 people
 - o Expect it will take 2 people 2 ½ hours
 - o Plan to purchase new trailers already spec'd with skirts (trailers from Manac & reefers from Great Dane & Utility)

- o Cost to have dealer install skirts: \$500-\$600 Canadian
- Maintenance/Damage:
 - o Freight Wing aluminum skirts: lost one rivet, but otherwise no damage, even during winter
 - o New plastic skirt: did a test where bent the material at a 75 degree angle & left it for ½ hour, then when released, it bounced right back to its original configuration
 - o When asked how they deal with steep inclines, reported that they train their drivers to take it slow and see the skirts working
- Costs:
 - o Skirts: CONFIDENTIAL
 - o Tires: recently bought 80 new tires with nitrogen inflation - \$1000 each
 - o Rims: recently bought 80 aluminum wheels - \$450 each
- Driver comments about skirts:
 - o Claim to feel the difference with skirts
 - Follow straighter
 - Smoother ride

Less resistance/eliminates cross wind effects

Summary of Telephone Meeting with J. B. Hunt Transport Services, Inc. Below is a summary of yesterday's (8/6/08) phone meeting with J.B. Hunt. In attendance from their end were: Gary Whicker (Sr. VP Engineering), Craig Harper (COO), Heather Matthews, and Christy Noland.

- JB Hunt owns a fleet of just under 25,000 53-foot trailers, as well as over 35,000 intermodal containers
- Their business model is comprised of four different types of services:
 - a regular over-the-road services
 - a dedicated contract services
 - a intermodal services
 - a non-asset brokerage services (where they typically contract with other trucking companies)
- To date, they have only tested two trailers with SmartWay aerodynamic devices (fairings), which they received a few months ago (Freight Wing products).
 - a Their experience with the two existing devices has not been positive, since one was delivered damaged. In addition, their maintenance staff are resistant to the new technology.
 - a They are already purchasing low rolling resistance tires
 - a They are considering testing a new technology offered by Adamworks (adamworksinc.com), out of Denver. That product is designed to lower the bottom of the fairing closer to the road when traveling at higher speeds. Estimated price: \$1995-\$2699 (turnkey).

- Attendees seemed supportive of the Heavy Duty Greenhouse Gas Emission Reduction Measure
 - They felt that holding shippers/receivers accountable is a logical and effective way to achieve compliance
 - They also felt that accountability **would** also be achieved by only holding shippers (and not receivers) accountable, since the major receivers are shippers as well
 - They had some concerns that brokers might not always be held responsible, since in most transactions brokers are not on the bill of lading (although J.B. Hunt is). They expressed concern that some shippers might get brokers' licenses to avoid responsibility for compliance
- Despite their support for this measure, they felt that it would increase the costs of tractors and trailers to the industry, which would lend further support to their intermodal services, which would become even more attractive to customers
 - They no longer send over-the-road trucks to California from east of the Rockies (only by rail)
 - Their average dray distance in California is 49 miles

Summary of In-Person Meeting with Conway Freight

On JULY 14, 2008, ARB staff met with Randal Mullett and Mike Grima of Conway. Also in attendance was Mike Tunnel of ATA. The main points they communicated to us were:

- * Conway has already taken measures to save fuel: reduced governed speed for all **their trucks** and using low rolling resistance tires in all of their Conway Truckload vehicles. They have a business relationship with Laydon Composites (aerodynamic components manufacturer) and have been testing **their** products.
- * They have 10,000 box-type trailers that travel throughout the U.S. About 10% of their business is in California. They currently don't keep track of which trailers come to California and would have to retrofit a substantial portion of their trailers to meet the California requirements
- * They stated that retrofitting with skirts does not result in a good return over investment. Four years ago, 400 new Conway trailers were outfitted with skirts. The fleet was pretty much dedicated, driving only between a few locations. Even so, virtually all skirts suffered road damage and needed to be frequently replaced. About a year ago, when they acquired CFI, the fleet was no longer dedicated to a few locations and traveled to different locations nationwide. That was when they decided not to continue and have been taking the skirts off, based on the following results:
 - The skirts were being damaged and required high maintenance/repair costs. Snow was piling onto the skirts, increasing trailer weight. Snow and ice also change the air flow, reducing effectiveness. They had to replace the skirts when the skirts were damaged, increasing costs. Note that they tested the older generation of skirts and not the more flexible ones that may be more durable and

less prone to easily damage. They have plans to test the new skirts.

- The trucks with skirts were being stopped at the border for inspection, causing delays.
- The skirts were damaged by curbs on tight turns and entering customer docks in older city areas.
- The trailers with skirts could not be lifted to put on train cars and used in intermodal operations.
- They stated that they observed fuel economy benefits of 0.2 mi/gal at high speed (over 60 mph) operation. Assuming 6 mi/gal, the skirts increased fuel economy by about 3 percent at high speeds. They did not get the 6 percent benefit they were expecting and there is no benefit at speeds below 45 mph making the net increase in fuel economy much smaller than the 3% received at high speeds.

Conway requested that we reconsider the trailer requirements and look at real-world versus test track or lab data on the technology fuel economy benefits. Also, they requested that we consider a longer phase-in for trailer retrofits because the cost of retrofitting their trailers is high and will not provide the return over investment to offset the cost. They also asked us to provide flexibilities for those companies with the highest SmartWay environmental performance score.

Appendix F:
Optional Trailer Fleet Compliance
Schedules

Appendix F: Optional Trailer Fleet Compliance Schedules

The proposed regulation would require all 2010 and previous model year 53-foot or longer box-type trailers that operate in California to be compliant with its equipment requirements before January 1, 2013. Alternatively, in lieu of meeting this compliance deadline, trailer owners would also have the option to participate in one of two optional trailer fleet compliance schedules. These schedules include the large fleet compliance schedule for fleets of 21 or more 53-foot or longer box-type trailers, and the small fleet compliance schedule for fleets with 20 or fewer 53-foot or longer box-type trailers. The trailer fleet compliance schedules would be available for 1) dry-van trailers and 2) refrigerated-van trailers that the owner elects not to bring into compliance with the refrigerated fleet compliance provision, as described in Chapter VIII, Requirements and Compliance Deadlines.

For the purposes of this proposal, a "nonconforming trailer" means a trailer that does not meet the equipment requirements of the proposed regulation. Under the two optional trailer fleet compliance schedules, trailer owners would be required to retrofit applicable nonconforming trailers with SmartWay equipment to bring them into compliance with the proposed regulation or retire them from California service according to an established timeline. By participating in any compliance schedule, trailer owners would be agreeing to allow ARB to periodically audit their vehicles and records to ensure that they are in compliance with all air quality regulations. ARB would reserve the right to terminate an owner's participation in any compliance schedule should the owner be found in violation of the proposed regulation. If participation in a compliance schedule is terminated by ARB, the owner would be required to reach full compliance within 90 days or by December 31, 2012, whichever is later, but no later than December 31 of the final compliance year of the applicable compliance schedule.

A. Minimum Fleet Compliance Thresholds

Under either of the two optional trailer fleet compliance schedules, a trailer owner would be required to meet certain minimum fleet compliance thresholds. A minimum fleet compliance threshold is the percentage of total trailers participating in a compliance schedule that must be either in compliance or retired by the end of a compliance year. Minimum fleet compliance thresholds would increase from year to year, and a trailer owner participating in a trailer fleet compliance schedule would be required to retrofit or retire a sufficient number of nonconforming trailers every year to meet these compliance thresholds. The large fleet compliance schedule would have six annual minimum fleet compliance thresholds starting in 2010, and the small fleet compliance schedule would have four annual minimum fleet compliance thresholds starting in 2013.

B. Trailer Fleet List

Fleet owners participating in a compliance schedule would be required to provide a trailer fleet list, which would include information on all 53-foot or longer

box-type trailers within the fleet, including compliant, nonconforming, exempted, and refrigerated trailers. The trailer fleet list would serve the following purposes:

- The number of trailers on this list would be used to ensure that fleets of 21 or more trailers do not participate in the small fleet compliance schedule.
- Except for refrigerated trailers to be phased-in under the refrigerated fleet compliance provision, and exempted trailers, only trailers participating in a trailer fleet compliance schedule would be allowed to be nonconforming after December 31, 2012. Therefore, the trailer fleet list would provide ARB a means to differentiate these trailers from nonconforming trailers that would be operating in violation of the proposed regulation.
- The list would also provide ARB with a tool with which to enforce the provisions of these compliance schedules and ensure that participating fleets are bringing their trailers into compliance as they are required.
- The list would be used to determine the compliance base number, which, in turn, would be used to calculate the retrofit and retirement commitments for each compliance year. The compliance base number would be the total number of nonconforming trailers that owners would choose to bring into compliance over the course of the applicable trailer fleet compliance schedule. The compliance base number would not include the following:
 1. Delayed compliance trailers, as determined in accordance with the early compliance option, as described in E.1.
 2. Early compliance trailers (trailers in compliance before January 1, 2010),
 3. Exempted trailers, or
 4. Refrigerated-van trailers for which compliance would be delayed pursuant to the refrigerated fleet compliance provision.

Compliant trailers that are not used to delay retrofits and retirements of delayed compliance trailers pursuant to the early compliance option (as described in E.1) could also be included in the compliance base number and used to meet annual minimum fleet compliance thresholds.

Except upon specific Executive Officer approval, ARB would not allow alterations to the number or identity of trailers on the trailer fleet list once the submission due date of the applicable compliance plan has passed. That is, outside of providing additional information about the trailers already listed, no other changes would be allowed. Model year 2010 and previous trailers brought into California after the applicable due date would not be eligible to participate in a trailer fleet compliance schedule, and would have to be compliant by December 31, 2012. Executive Officer approval would only be granted for extenuating circumstances, such as company mergers, acquisitions, or splits.

C. Compliance Plan

To participate in an optional trailer fleet compliance schedule, a trailer owner would be required to submit a compliance plan outlining how the owner plans to meet the applicable minimum fleet compliance thresholds. The plan would have to include, for each compliance year, a detailed list of nonconforming trailers to be retrofitted or retired that year. The number of trailers included on each list would have to be enough to ensure that the fleet meets the minimum fleet compliance threshold for that applicable compliance year. By providing these lists, the owner would be making a commitment to retrofit or retire these trailers as reported. Failure to meet these commitments would constitute a violation of the proposed regulation.

D. Small Fleet Versus Large Fleet

The proposed regulation would offer a deferred compliance schedule for smaller fleets, providing additional time for them to bring their trailers into compliance. For the purposes of the trailer fleet compliance schedules, staff defined a "small fleet" as a fleet with 20 or fewer trailers. Staff established this definition by using transportation revenue estimates (CEC, 2007; EIA, 2008; and OOIDA, 2004) and the definition of "small business" set forth in Government Code 11342.610.

To determine fleet size, fleets would have to account for all 53-foot or longer box-type trailers within the fleet, including exempted trailers, compliant trailers, nonconforming trailers, and refrigerated trailers.

E. Large Fleet Compliance Schedule

The large fleet compliance schedule was established for fleets of 21 or more 53-foot or longer box-type trailers. If a trailer owner does not participate in the early compliance option, the large fleet compliance schedule would provide fleet owners six years to either retrofit all their nonconforming trailers to meet the equipment requirements of the proposed regulation or retire such trailers from California service. The annual minimum fleet compliance thresholds for the large fleet compliance schedule are presented in Table F-1 below.

Table F-1: Minimum Fleet Compliance Thresholds for Large Fleets

Compliance Year	2010	2011	2012	2013	2014	2015
Fleet Compliance Threshold	5%	15%	30%	50%	75%	100%

Staff believes that six years is enough time for manufacturers of SmartWay trailers and equipment to increase production capacity to match the expected increase in demand for their products. In addition, the time would allow certain fleets to better manage the concurrent financial and logistical impacts of the proposed regulation and the proposed Truck and Bus Rule.

1. Early Compliance Option

The large fleet compliance schedule would also provide an option to delay retrofits and retirements until 2016 if an owner has compliant trailers operating before January 1, 2010. For the purposes of the early compliance option, an "early compliance trailer" means a trailer brought into compliance before January 1, 2010, and a "delayed compliance trailer" means a trailer for which compliance may be delayed until 2016. Under the early compliance option, one trailer brought into compliance before January 1, 2009 would allow the delay of 1.5 trailer retrofits or retirements until 2016. However, a trailer owner would only be allowed to delay a maximum of 30 percent of the total number of trailers participating under the large fleet compliance schedule, which for this purpose, would also include their early compliance trailers. For example, a person who owns 100 trailers would be allowed to delay the compliance of up to 30 trailers until 2016, if they had brought at least 20 trailers into compliance by December 31, 2009.

Delayed compliance trailers would be subtracted from the total pool of nonconforming trailers for the purpose of determining the compliance base number and retrofit and retirement commitments for compliance years one through six. Therefore, participating in this option would reduce the number of trailers that would have to be retrofitted or retired each year during the six-year compliance schedule. Delayed compliance trailers would have to be brought into compliance by December 31, 2016.

The early compliance option would provide additional flexibility for trailer owners, but also ensure that GHG reductions would not be lost.

2. Large Fleet Compliance Plan Revision

Prior to the fourth compliance year, ARB would allow a trailer owner participating in the large fleet compliance schedule to submit a large fleet compliance plan revision to reorder trailer retrofit and retirement commitments for compliance years four, five, and six. For example, a trailer owner would have the option to switch a trailer scheduled for a fourth year retrofit with a trailer scheduled for a sixth year retrofit if, for some reason, the latter trailer was brought into compliance earlier than expected. This optional provision would provide trailer owners additional flexibility to re-evaluate their compliance plans at the mid-point of the compliance schedule. However, trailer owners opting to revise their compliance plan would not be allowed to alter commitments in a way that would result in the fleet's failure to meet an applicable minimum fleet compliance threshold.

F. Small Fleet Compliance Schedule

For fleets with 20 or fewer 53-foot or longer box-type trailers, the small fleet compliance schedule may be used. This schedule provides additional time for smaller fleets to begin bringing their trailers into compliance. The annual

minimum fleet compliance thresholds for the small fleet compliance schedule are presented in Table F-2 below.

Table F-2: Minimum Fleet Compliance **Thresholds** for Small Fleets

Compliance Year	2013	2014	2015	2016
Fleet Compliance Threshold	25%	50%	75%	100%

The benefits of the small fleet compliance schedule would include:

- Smaller fleets would have additional time to base their decisions on What technologies larger fleets are using.
- Demand from larger fleets would stimulate equipment production and potentially drive down prices in later years when smaller fleets would need to comply.
- The delay would provide additional lead-time for smaller fleets to devise their compliance strategies.

G. Reference

CEC, 2007. California Energy Commission. *Transportation Energy Forecasts for the 2007 Integrated Energy Policy Report*. GEC-600-2007-009-SF. September 2007.
<http://www.energy.ca.gov/2007publications/CEC-600-2007-009/CEC-600-2007-009-SF.PDF>

EIA,2008. Energy Information Administration. *Diesel Historical Data (.xls)*.
<http://tonto.eia.doe.gov/oog/info/wohdp/diesel.asp>

OOIDA,2004. Owner Operator Independent Drivers Association. *2004 Owner Operator Member Profile Survey*.

Appendix G:

Implementation and Enforcement

Appendix G: Implementation and Enforcement

A. Implementation

If adopted, ARB would need to take the following actions to implement the proposed regulation.

- Develop an outreach program to inform drivers, motor carriers, California-based brokers, tractor and trailer owners, and California-based shippers about the adopted regulation and any financial assistance or incentive programs that may be available.
- Develop guidance documents for the regulation and its compliance schedules.
- Develop a web-based tractor and trailer registry, which would be primarily used for compliance schedule reporting, but would also be available for voluntary compliance reporting.
- Develop databases and programming that would allow both enforcement personnel and the public to access compliance information about registered vehicles.
- Develop forms for compliance schedule reporting.
- Set up the existing 1-800-END-SMOG telephone line to receive both questions about the proposed regulation and complaints about regulatory violations.
- Develop an enforcement action plan.
- Develop settlement guidance for violation penalties.
- Develop an enforcement training program for peace officers and local air pollution control districts.
- Develop an audit procedure for the compliance schedules.

B. Enforcement

In addition to ARB's enforcement staff, the proposed regulation would also give enforcement authority to peace officers and local air pollution control districts. Staff envisions the proposed regulation could be enforced in the following ways:

- ARB's enforcement personnel would be able to verify compliance with the proposed regulation during roadside inspections conducted as part of the Heavy-Duty Vehicle Inspection Program.
- ARB's enforcement personnel would be able to verify compliance with the proposed regulation during audits conducted as part of the Periodic Smoke Inspection Program. These audits are typically conducted at vehicle storage facilities where numerous vehicles can be inspected in one visit.
- Although ARB's enforcement personnel would continue responding to air quality complaints, peace officers and local air pollution control districts could also handle complaints pertaining to the proposed regulation.

- At their own discretion, peace officers and local air pollution control districts could also enforce the proposed regulation as part of their daily duties.

The discovery of a violation could lead to more in-depth fleet-wide audits and targeted inspections, if deemed necessary by enforcement personnel.

ARB's enforcement personnel would also have the option to conduct comprehensive compliance audits of fleets that elect to participate in one of the two optional trailer fleet compliance schedules. By choosing to comply with an optional trailer fleet compliance schedule, a trailer owner would be agreeing to allow authorized enforcement personnel to conduct periodic audits of both vehicles and records. If an owner were found in violation of the proposed regulation, ARB would be able to terminate the owner's participation in an optional trailer fleet compliance schedule, which may substantially accelerate the fleet's compliance timeline. Therefore, ARB's audit authority would encourage most participants to keep their fleet in compliance with the requirements of the proposed regulation.

Under the proposed regulation, enforcement efforts would be primarily directed at drivers, motor carriers, tractor owners, and trailers owners. Therefore, if a noncompliant tractor or trailer were found operating on a California highway, the driver, motor carrier, and tractor or trailer owner, as applicable, would receive a notice of violation (NOV). Although California-based shippers and brokers would not initially be held responsible for a noncompliant tractor and trailer, the proposed regulation could be enforced on them in situations involving a motor carrier, tractor owner, or trailer owner that has failed to settle a previously-issued NOV. The enforcement strategy applicable to California-based shippers and brokers is explained in more detail below.

Since California-based shippers and brokers are not typically responsible for the tractors and trailers they use, they would not initially be held liable for tractors and trailers found in violation. However, enforcement action could be taken on a California-based shipper or broker in situations meeting the following criteria:

1. The shipper or broker is involved in a shipment where the tractor or trailer is found operating in violation of the proposed regulation, and
2. The motor carrier, tractor owner, or trailer owner involved in the shipment has an unsettled NOV that was issued for a previous shipment in which the shipper or broker was also involved, and
3. The shipper or broker has received a notification from ARB regarding the delinquent status of the motor carrier, tractor owner, or trailer owner.

The primary intent of this strategy is to ensure that out-of-state motor carriers, tractor owners, and trailer owners also comply with the proposed regulation. Historically, it has been very time consuming and costly to collect penalties from unresponsive out-of-state fleets. This is because the State has no authority to hold the registrations of out-of-state

registered vehicles, and limited authority to hold the vehicles themselves. Therefore, if an out-of-state registered fleet refuses to settle an NOV, it is currently necessary, in many cases, for the State of California to file a lawsuit against that fleet in their state of residence to collect any penalties. However, under the strategy of the proposed regulation, staff expects that most motor carriers, tractor owners, and trailer owners, including those domiciled out-of-state, would choose to settle their NOVs in order to avoid any potential detriment to their relationships with California-based shippers and brokers. Ensuring that out-of-state fleets are treated the same as California-registered fleets with respect to enforcement would provide an equitable playing field for those doing business in California.

Under the proposed strategy, ARB would notify all affected California-based shippers and brokers involved in a shipment for which an NOV was issued to the motor carrier, tractor owner, or trailer owner. This notification would be provided for informational purposes only. If, however, the violating motor carrier, tractor owner, or trailer owner, were to fail to settle the NOV within the permitted time period, ARB would then send a second notification to affected shippers and brokers notifying them that, until the NOV is settled, they could also be held liable for future violations involving the delinquent motor carrier, tractor owner, or trailer owner. Staff believes that shippers would have three options after receiving this notification:

1. They could implement a written agreement that would pass on the cost of any penalties to the motor carrier, tractor owner, or trailer owner.
2. They could begin inspecting tractors and trailers prior to loading.
3. They could use a different motor carrier, tractor owner, or trailer owner for their transportation needs.

Because the proposed regulation was developed pursuant to AB 32, any violation would be Subject to the penalties set forth in Article 3 (commencing with Section 42400) of Chapter 4 of Part 4 of Division 26 of the California Health and Safety Code.

