California Environmental Protection Agency
AIR RESOURCES BOARD

STAFF REPORT:
INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING

PROPOSED AMENDMENTS TO THE TRUCK AND BUS REGULATION

Mobile Source Control Division
Heavy-Duty Diesel Implementation Branch

March 2014

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State of California
AIR RESOURCES BOARD

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PUBLIC HEARING TO CONSIDER ADOPTION OF THE PROPOSED AMENDMENTS TO THE TRUCK AND BUS REGULATION

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LIST OF ACRONYMS

AB	Assembly Bill
ARB	Air Resources Board
ATCM	Airborne Toxic Control Measure
BACT	Best Available Control Technology
BC	Black Carbon
Board	Air Resources Board
CAA	Clean Air Act
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CO_2	Carbon Dioxide
DMV	California Department of Motor Vehicle
GVWR	Gross Vehicle Weight Rating
GWP	Global Warming Potential
HSC	Health and Safety Code
$MMTCO_2e$	Million Metric Tons of CO_2 Equivalents
NAAQS	National Ambient Air Quality Standard
NOx	Oxides of Nitrogen
OEM	Original Equipment Manufacturer
PM	Particulate Matter
PM2.5	Particles up to 2.5 microns in diameter
PTO	Power Take Off
SIP	State Implementation Plan
TPD	Tons per Day
TRUCRS	Truck Regulation Upload and Compliance Reporting System
U.S. EPA	United States Environmental Protection Agency
VDECS	Verified Diesel Emission Control Strategy
VMT	Vehicle Miles Travelled

I. INTRODUCTION AND BACKGROUND

A. Specific Purpose for the Amendments

The proposed regulatory amendments are designed to ensure the air quality goals of the Truck and Bus regulation are achieved by providing additional flexibility for fleet owners to comply. More specifically, the proposed amendments are intended to:

- Protect the regulation's emission reductions by providing lower cost compliance options to small fleets, low mileage fleets, and certain areas with cleaner air
- Provide new opportunities for fleet owners to access public incentive funds
- Recognize fleet owners that made early investments to comply

B. Introduction

The Truck and Bus regulation requires the one million trucks that operate annually in California to meet particulate matter (PM) and oxides of nitrogen (NOx) emissions requirements to achieve California's air quality goals and obligations under the federal Clean Air Act. To comply with the regulation, fleet owners must transition from older higher emitting vehicles to newer lower emitting vehicles. In order to ensure emissions reductions are achieved, staff is proposing amendments that provide additional flexibility for fleet owners to enable compliance.

The Staff Report describes the proposed amendments and the rationale for each amendment. It also presents staff's analysis of impacts associated with the implementation of the proposed amendments, including costs, and economic and environmental impacts. The text of the regulation is set forth in the proposed regulation order in Appendix A.

C. Background

California faces many air quality challenges including attaining federal air quality standards and minimizing exposure to toxic diesel PM. Achieving these goals requires substantial emissions reductions from the many mobile sources that generate air pollution in California. ARB has adopted regulations focused on all mobile sources that operate within the state including ocean-going vessels, commercial harborcraft, cargo handling equipment, in-use off-road equipment, transportation refrigeration units, public fleets, solid waste collection vehicles, urban transit buses, and drayage trucks.

In 2010, heavy-duty trucks operating in California emitted 30 percent of all NOx emissions from mobile sources, which are the most important contributor to both federal ozone and fine particulate matter (PM2.5) air quality standard violations across California. These violations are most severe in the South Coast and San Joaquin Valley regions of California. The federal Clean Air Act (CAA) set attainment dates in these regions for the annual ambient PM2.5 standard in 2014, and for ozone in 2023.

Heavy-duty diesel trucks were also the largest source of diesel PM emissions in California. Diesel PM is a carcinogen and toxic air contaminant. Risks are particularly high in urban areas and along busy roadways where trucks operate. To protect public health, the Board approved the Risk Reduction Plan to Reduce Exposure to Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (Diesel Risk Reduction Plan) on September 30, 2000, which set a target of an 85 percent reduction in statewide exposure to diesel PM by 2020. The Truck and Bus regulation is a major part of achieving this goal.

On December 12, 2008 the Air Resources Board (ARB or Board) approved the Truck and Bus regulation. The regulation applies to nearly one million diesel vehicles with a manufacturer's gross vehicle weight rating (GVWR) greater than 14,000 pounds that annually operate in California. This regulation was designed to reduce exposure to diesel PM and to provide NOx reductions to help achieve attainment with ambient PM2.5 and ozone air quality standards. On December 17, 2010, the Board approved amendments that restructured the regulation in light of the economic recession that had effectively reduced emissions from regulated trucks and buses through lower vehicle activity. Those amendments became effective on December 14, 2011. Since that time, the United States Environmental Protection Agency (U.S. EPA) approved the Truck and Bus regulation as part of California's Air Quality Plan to meet federal air quality standards (SIP).

The regulation requires trucks and buses to meet PM filter requirements starting January 1, 2012, and to upgrade to 2010 model year or newer engines (to reduce NOx emissions) starting January 1, 2015. Emissions reductions are achieved through: 1) the installation (retrofit) of verified diesel emission control strategies (VDECS or diesel PM filter) on existing engines, 2) by replacing older vehicles with newer vehicles equipped with cleaner engines, or 3) repowering vehicles with newer, cleaner engines. The regulation provides a variety of flexibility options tailored to fleets operating low use vehicles, fleets operating in selected vocations like agricultural and construction, and small fleets of three or fewer trucks. These options were designed to provide more affordable compliance pathways for fleet owners. To assist in meeting these requirements, ARB and local air districts offer a variety of programs that provide grants and loans to help facilitate compliance. These programs are generally targeted towards smaller fleet owners.

The regulation provides substantial emissions reductions which are necessary to meet State and federal air quality standards, reduce premature deaths attributable to exposure to PM2.5 emissions and reduce exposure to diesel PM to meet the State's goals established in the Diesel Risk Reduction Plan.

D. Summary of Existing Regulation

The regulation applies to nearly all diesel fueled trucks and buses with a GVWR greater than 14,000 pounds that operate in California, regardless of their registration jurisdiction. It applies to all privately or federally owned trucks, and to privately and publicly owned school buses. Public fleet vehicles, solid waste collection trucks, and

transit buses are already subject to other regulations and are not part of the Truck and Bus regulation, Drayage trucks and utility-owned vehicles are subject to other regulations, but become subject to the regulation beginning January 1, 2021. A more detailed summary of the existing regulation is in Appendix B.

1. Requirements for Lighter Trucks and Buses

Lighter trucks and buses do not have compliance requirements until 2015. Table I-1 below lists the compliance dates, by engine model year for lighter trucks. Starting January 1, 2015, lighter trucks with engines that are 20 years or older need to be replaced with newer trucks that have 2010 model year or newer engines. Starting January 1, 2020, all remaining trucks and buses need to be replaced so that they have 2010 or later model year engines by 2023.

Table I-1: Engine Model Year Schedule for Lighter Trucks

Engine Year	Replacement Date
1995 and older	January 1, 2015
1996	January 1, 2016
1997	January 1, 2017
1998	January 1, 2018
1999	January 1, 2019
2003 and older	January 1, 2020
2004-2006	January 1, 2021
2007-2009	January 1, 2023

Fleet owners also have the option to install a retrofit PM filter on a lighter truck by January 1, 2014 to make the truck exempt from replacement until January 1, 2020.

2. Compliance Requirements for Heavier Trucks and Buses

Heavier trucks and buses with a GVWR greater than 26,000 pounds have two primary ways to comply. Fleet owners can follow a compliance schedule by engine model year or may use a phase-in option that is more flexible but requires fleet owners to report.

Starting January 1, 2012, heavier trucks are required to meet the engine model year schedule shown in Table I-2 below. Fleet owners that comply with the schedule must install a PM filter on 1996 model year and newer engines and must replace the vehicle 8 years later. Trucks with 1995 model year and older engines would be replaced starting 2015. By 2023, nearly all trucks and buses operating in areas that do not meet federal air quality standards must have 2010 model year or later engines, which reduce NOx and PM exhaust emissions by 90 percent relative to engines produced as recently as 2006.

Table I-2: Engine Model Year Schedule for Heavier Trucks

Engine Year	Requirement on January 1
Pre-1994	No requirements until 2015, then 2010 engine
1994-1995	No requirements until 2016, then 2010 engine
1996-1999	PM filter from 2012 to 2020, then 2010 engine
2000-2004	PM filter from 2013 to 2021, then 2010 engine
2005-2006	PM filter from 2014 to 2022, then 2010 engine
2007-2009	If PM filter equipped, no requirements until 2023, then 2010 engine
2010	Meets final requirements

In addition, there is a PM phase-in option that allows fleet owners to decide which vehicles to retrofit or replace, regardless of engine model year. To use this option, fleet owners must have reported information about all of their heavier trucks starting January 31, 2012. Fleet owners can comply by demonstrating they have met the percentage requirement each year as shown in Table I-3 below. Engines equipped with PM filters from the original equipment manufacturer (OEM) or that are retrofitted, count equally towards compliance. Any engine with a PM filter, regardless of model year, is compliant until at least 2020. Beginning January 1, 2020, all heavier trucks and buses need to meet the requirements specified in Table I-2 above.

Table I-3: Phase-In Option for Heavier Trucks

Compliance Date	Vehicles with PM Filters
January 1, 2012	30%
January 1, 2013	60%
January 1, 2014	90%
January 1, 2015	90%
January 1, 2016	100%

Fleet owners that use this option can also take advantage of credits. For example, any lighter vehicle (GVWR of 14,001 to 26,000 pounds) or heavier vehicle equipped with a PM filter retrofit prior to October 2011 also received a credit that would delay compliance for a heavier vehicle in the same fleet.

3. Small Fleet Option

Small fleets are defined as fleets of one to three diesel trucks and buses with a GVWR greater than 14,000 pounds. The small fleet option required small fleet owners with heavier trucks to begin meeting PM filter requirements starting January 1, 2014, and defers heavier truck replacements until January 1, 2020 or later (greater than 26,000 pounds). Lighter trucks continue to use the engine model-year schedule described above in Table I-1.

To use the small fleet option, heavier vehicles in the fleet must comply with the schedule shown in Table I-4.

Table I-4: Small Fleet Option

Small Fleet Option	Existing Schedule
First Truck	January 1, 2014
Second Truck	January 1, 2015
Third Truck	January 1, 2016

In areas that do not federal air quality standards, vehicle replacements begin January 1, 2020 on the same model year schedule as larger fleet owners. Small fleet owners may delay their heavier truck replacements until January 1, 2023 if all of their heavier vehicles were equipped with PM filters by January 1, 2014.

4. School Buses

Regardless of fleet size, all lighter and heavier school buses were required to meet PM filter requirements by 2014, according to the schedule shown in Table I-5, but are not required to upgrade to 2010 model year engines.

Table I-5: School Bus PM Filter Requirements

Compliance Date	Percent of School Bus Fleet
January 1, 2012	33%
January 1, 2013	66%
January 1, 2014	100%

5. Credits, Extensions and Exemptions

The regulation provides many opportunities for fleet owners to take advantage of various credits, extensions, and exemptions.

a) Credit Provisions

Fleet owners that report and use the phase-in option for heavier trucks can take advantage of credits to delay requirements for other heavier trucks in the fleet until 2017 for the following:

- Early installation of PM filter retrofits before 2012.
- Purchase of cleaner engines before 2012 (OEM PM filters).
- Reducing the number of trucks since 2006.
- Adding fuel-efficient hybrids or alternative fueled engines to the fleet.

b) Extensions

<u>Low mileage construction trucks:</u> Owners of low mileage construction trucks may choose to phase-in PM filters from 2014 to 2016 as shown in Table I-6. An owner with one low-mileage construction trucks would need to have a PM filter by January 1, 2016. Starting 2020, the trucks must be upgraded to meet the 2010 model year engine requirement as specified in the engine model year schedule for heavier trucks. Eligible

trucks include any dump truck operated for less than 20,000 miles per year, or any of the following trucks operated for less than 15,000 miles per year:

- Trucks owned by a licensed contractor.
- Concrete mixers, concrete pump trucks, water trucks, single engine cranes with a load rating of 35 tons or more, or tractors that exclusively pull low-boy trailers.

Table I-6: Low Mileage Construction Truck Phase-in Schedule

Compliance Date	PM Filter Phase-in
January 1, 2014	33%
January 1, 2015	66%
January 1, 2016	100%

This option for low-mileage construction trucks was added with the amendments in 2010 in recognition of the impacts of the recession. Dump trucks are directly associated with construction and were given a higher mileage threshold.

Log trucks: Log truck owners have the opportunity to opt-in to a compliance schedule by modernizing log trucks to 2010 model year or later engines at a rate of 10 percent of the log trucks in the fleet per year from 2014 to 2023.

Agricultural vehicles: The regulation provides specific flexibility for trucks and buses that are exclusively use for agricultural operations. These include agricultural vehicles such as trucks and buses owned by log harvest operations or farming businesses and certain trucks that are not farmer-owned but are dedicated to supporting agricultural operations.

Under this extension, vehicles that stay below the annual mileage limits shown in Table I-7 are eligible for an extension from the PM requirements until 2017, at which time they must be upgraded to comply with the engine model year schedule for heavier trucks. Vehicles that have operated less than 10,000 miles per year since January 1, 2011 can continue to use the extension until January 1, 2023.

Table I-7: Existing Agricultural Vehicle Extension until January 1, 2017

Engine Model Year	Existing Annual Limit
2006 or newer	25,000 miles
1996 to 2005	20,000 miles
1995 and older	15,000 miles

c) Exemptions

Low-Use: Any vehicle operating less than 1000 miles per year within California's borders and having less than 100 hours per year of power take-off (PTO) operation is exempt from PM filter or 2010 model year engine requirements.

NOx Exempt Areas: Fleet owners that operate trucks solely within certain areas with cleaner air quality (defined as "NOx Exempt Areas" in the regulation) may choose to phase-in PM filters on heavier trucks from 2014 to 2016, as shown in Table I-8, and are not required to make further upgrades. A map of the NOx exempt areas is shown in Figure VIII-1.

Table I-8: NOx Exempt Area Phase-in Schedule

Compliance Date	PM Filter Phase-in
January 1, 2014	33%
January 1, 2015	66%
January 1, 2016	100%

E. 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), 39601 (Standards, Definitions, Rules and Measures), and 39602.5 (Adoption of Rules and Regulations) 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 and to attain federal national ambient air quality standards in all areas by applicable attainment dates. 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 new and in-use on-road and off-road diesel engines used in motor vehicles.

Additionally, California's Air Toxics Program, established under California law by Assembly Bill (AB) 1807 (stats. 1983, ch. 1047, the Tanner Act) and set forth in the HSC sections 39650 through 39675, mandates that ARB identify and control air toxics emissions in California. Following the identification of a substance as a toxic air contaminant, HSC section 39665 requires ARB, with the participation of the local air pollution control and air quality management districts (local air 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 airborne toxic control measures (ATCM) that will respectively achieve emission reductions using best available control technology (BACT) for non-vehicular and vehicular sources, the latter of which includes in-use on-road heavy-duty vehicles. ARB identified particulate matter emissions from diesel engines as a Toxic Air Contaminant by regulation (13 California Code of Regulations section 93000) in August 1998.

Under the CAA, U.S. EPA does not have authority to adopt in-use emission standards relating to the control of in-use motor vehicles or engines or in-use nonroad (off-road) engines used in vehicles or equipment. Thus, there are no federal regulations

comparable to the Truck and Bus regulation to reduce emissions from in use on road diesel vehicles or vehicles that use off-road engines that operate in California.

Section 209(a) of the CAA preempts states from adopting emission standards for new motor vehicles and engines. However, section CAA 209(b) provides that the Administrator shall grant California a waiver of preemption, unless certain specified findings can be made. The regulations proposed for amendment do not establish emission standards for new motor vehicles and engines, and thus no issue of federal preemption exists. Additionally, 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 CAA section 209(e)(1), new off-road engines under 175 horsepower used in farm and construction equipment and vehicles and new locomotives and locomotive engines). The Truck and Bus regulation has requirements for off-road engines used in yard-goats (for agricultural operations) and auxiliary engines of 2 engine sweepers that require waiver authorization from U.S. EPA for California to be authorized to enforce requirements on those vehicles. With the exception of these 2 vehicle types, no other vehicle types subject to the regulation require an authorization. ARB requested that U.S. EPA grant authorization of a waiver for the 2 above-described types of vehicles on March 2, 2012, and was granted the request for authorization of California's emission standards and accompanying enforcement procedures for in-use off-road yard trucks and auxiliary engines used in 2 engine sweepers as described in the Truck and Bus regulation on May 24, 2013. To the extent that the proposed amendments affect the previously granted authorization, ARB will submit a follow-up request to U.S. EPA for authorization action.

II. STATEMENT OF REASONS

A. Description of Problem Proposal is Intended to Address

At the October 24, 2013 meeting of the ARB, staff provided an update to the Board on the implementation of the Truck and Bus regulation. Stakeholders expressed concern regarding the ability of some fleet owners to make the needed upgrades to comply. These concerns specifically focused on small fleets, lower mileage fleets, and fleets in rural areas, all which arguably continue to be impacted by the recession. Staff informed the Board that it intended to develop and propose amendments that will help ensure that the air quality benefits originally envisioned by the regulation will be achieved with the objective of addressing concerns about the ability of these fleets to comply.

B. Proposed Solutions to the Problem

Staff is proposing regulatory amendments that preserve more than 90 percent of the emissions benefits of the regulation necessary to meet California's air quality obligations under the CAA and the goals of the Diesel Risk Reduction Plan while providing additional regulatory flexibility to small fleets, lower mileage fleets, and fleets in certain areas that have made substantial progress towards cleaner air. In developing the amendments, staff focused on three objectives:

- Protecting emission reductions by providing lower cost compliance options to small fleets, low mileage fleets, and fleets in areas with cleaner air that would result in greater levels of compliance.
- Providing new opportunities for fleet owners to access public incentive funds.
- Recognizing fleet owners that made early investments to comply.

To achieve these objectives and benefits, staff is proposing amendments to the Truck and Bus regulation that include:

- A longer-phase-in period for PM requirements for trucks operated exclusively in certain rural areas that have made substantial progress towards cleaner air while continuing to ensure compliance with diesel risk reduction program goals.
- Additional time and a lower cost pathway for all small fleet owners to achieve. compliance with PM requirements, while re-opening opportunities for these fleet owners to apply for and receive public incentive funding.
- A compliance pathway for owners currently unable to qualify for a loan to finance compliance.
- Adjusted schedules for low-use vehicles, trucks use in certain vocations, and work trucks that travel fewer annual miles and are less competitive in obtaining incentive funding.
- Recognition of fleet owners that took action to comply by providing additional useable life for retrofit trucks and reducing near-term compliance obligations.

Additional detail and examples of how the individual amendments would affect fleet owners and the rational is discussed in more detail in Chapter VIII.

Overall, these amendments would achieve about $400 million dollars in cost savings, a 20 percent reduction in overall regulatory cost, for those affected by the amendments, while:

- By 2020, ensuring emissions would be at the same level as the existing regulation.
- Continuing progress in reducing statewide exposure to diesel PM from vehicles covered by the regulation by 85 percent, in support of the Diesel Risk Reduction Plan.
- By 2023, providing the NOx reductions from trucks necessary to satisfy State commitments associated with meeting State and federal air quality standards.

While the proposed amendments would lower the rate that risk from exposure to diesel PM is reduced, the amendments still represent the maximum feasible emissions reductions as required by HSC section 39666(c). By 2023, the amended regulation would cumulatively achieving 93 percent of the PM2.5 and NOx benefits, and similar benefits to reduce premature deaths attributable to exposure to PM2.5 emissions, as was envisioned in 2010. Staff believes the proposed amendments are appropriate as they provide additional flexibility to fleet owners that are still suffering from the impacts of the economic recession while preserving the overall benefits of the regulation.

C. Rationale Supporting the Solutions

1. Overview

At the October 24, 2013 Board meeting, staff updated the Board on the implementation of the regulation and on-going efforts to assist fleet owners with compliance. Staff also discussed potential amendments to the regulation that could provide additional flexibility to vehicle owners by ensuring a more successful compliance path, thereby better protecting the emission benefits of the regulation through greater levels of compliance. At the same time, some industry stakeholders and opponents expressed concerns about the economy and costs of compliance, the availability of incentive funding, the durability and performance of diesel PM filters, and the need to provide additional flexibility beyond what had been discussed by staff in the hearing. Public health, environmental, and other stakeholders advocated the need to continue to achieve emissions reductions to ensure attainment with air quality standards, and to reduce exposure to diesel particulate. They also expressed the viewpoint that the regulation has been effectively implemented for several years and that diesel PM filters have been successfully demonstrated in tens of thousands of trucks and other equipment. Good industry actors who have already invested to comply want no changes to the regulation. They argue that new flexibilities unfairly take away any reward for their early actions. The Board agreed that additional flexibility should be provided while considering the environmental and economic impacts of any changes, and staff committed to return with proposed amendments in April 2014.

Because the amendments could not be considered by the Board before the January 1, 2014, regulatory deadline, on November 13, 2013, ARB issued an advisory describing how fleet owners could receive additional time to meet 2014 PM requirements by making good faith efforts to comply and reporting those efforts to ARB. Those good faith efforts included:

- Entering into an agreement with an authorized installer for a diesel PM filter retrofit.
- Signing a purchase contract and ordering a replacement truck that is equipped with a PM filter (2007 model year engine or newer).
- Being approved or denied a loan or other financing for a diesel PM filter or replacement truck that is equipped with a PM filter.
- Being eligible and applying for public incentive funding for a cleaner replacement truck.

In addition, the advisory also allowed fleet owners to take advantage of some of the proposed amendments that are described in the Staff Report. A copy of the advisory is in Appendix I. Since releasing the advisory, truck owners reported more than 20,000 additional trucks into the system to use the provisions of the advisory.

2. Industry Concerns with the Current Regulation

In developing the proposed amendments, staff conducted a series of five public workshops in December 2013 in Redding, Sacramento, Diamond Bar, San Diego, and the San Joaquin Valley (Fresno, and via videoconference to Bakersfield and Modesto). Staff also held various meetings with affected stakeholders to solicit comments regarding the proposed amendments to the regulation. Industry concerns expressed in these workshops were consistent with concerns expressed in the October 2013 Board meeting, and focused in three general areas described below.

a) Current Economic Conditions and Compliance Costs

An overarching issue raised by stakeholders is that the regulation is not affordable, especially considering the slow recovery from the recession. The recession in 2008 and 2009 had a major impact on the trucking industry in California, as witnessed by a significant reduction in fuel use and vehicle activity between 2007 and 2010. In response, fleet owners typically adapted their management practices by reducing the size of their fleet and curtailing new and used vehicle purchases. During this period the average age of fleets increased significantly while business activity, as measured by annual vehicle miles traveled, declined. Due to this reduction in business activity, some fleet owners went out of business, which contributed to increased unemployment in California.

Today the economy is recovering, albeit at the lower end of the pace we anticipated in 2010. More importantly, the recovery is not uniform across the State. In particular, the Bay Area and many portions of the Los Angeles area are recovering much more quickly than rural areas such as the north State and San Joaquin Valley. Using employment

statistics as an illustrative example, rural areas currently have 7 to 14 percent unemployment (with Imperial County as high as 22 percent), while urban coastal areas have unemployment rates in the 5 to 10 percent range. In general, many fleet owners may not have fully recovered from the recession, especially fleet owners in rural areas, smaller fleets, and lower mileage fleets affected by the significant reduction in statewide construction activity. In addition, on January 17, 2014, Governor Brown declared a drought emergency in California which has and will continue to affect many industries, particularly agriculture (Bloomberg, 2014).

The cost of compliance for many fleet owners, especially small fleet owners, can be significant. Retrofit diesel PM filter systems generally cost in the $15,000 to $19,000 range. This includes taxes and installation but excludes annual maintenance. Current costs of a new Class 8 heavy-duty truck generally ranges between $90,000 and $170,000; however, used truck prices decline significantly with age and over time can become a more affordable option to comply. These costs do not reflect additional costs for work trucks with specialty body types (e.g., vacuum tank trucks) that can be significantly higher. Owners of these work trucks can transfer the existing body to another truck; however, this adds cost and takes a truck out of service to make the change. The uneven economic recovery has reduced the ability of some fleet owners to make the necessary investments to comply, and additional regulatory flexibility may be warranted to assist these fleet owners in achieving compliance, thereby protecting the expected emissions reductions.

The proposed amendments provide additional flexibility for many impacted fleet owners that could help ensure the emissions benefits envisioned by the regulation will be realized. The amendments will continue to meet the Board's air quality goals while providing additional economic relief to facilitate the ability for vehicle owners to comply.

b) Availability of Incentive Funding

Many stakeholders requested more public incentive money be made available to help facilitate compliance. ARB and local air districts provide a variety of grants and loan opportunities through the Carl Moyer Program, the Proposition 1B Bond Program, the Truck Loan Assistance Program, and others. Through prior regulatory development efforts, staff took steps to provide as much opportunity as possible for fleet owners to obtain access to this funding. However, these programs have strict eligibility requirements that must be met in order for funding to be provided, and there is not enough funding to pay for compliance across the industry, with funding particularly limited in rural areas. Today, with impending compliance requirements, many of the funding opportunities are closed and many stakeholders are ineligible for public incentive funding because they have an impending deadline, are out of compliance, or operate in rural areas with limited funding options.

The proposed amendments would provide additional time for small fleets and economically challenged fleet owners to comply, and this additional time could allow these fleet owners to be newly eligible for public incentive funding programs.

c) Balancing the Needs of Compliant and Non-Compliant Fleets

There are more than a million trucks subject to the regulation that are in fleets that operate annually in California. A sizeable majority of these trucks (625,000) are in fleets registered outside of California that transport freight between states and dispatch part of their fleet to California periodically during the year. Because of the high mileage, these long haul fleet owners commonly replace their trucks in three to 10 year cycles, most of these fleets have a sizeable fraction of compliant trucks and can in most cases dispatch these trucks to California to meet compliance requirements at little to no additional cost.

The situation is somewhat different for the more than 375,000 vehicles that operate exclusively within the State. These vehicles are generally registered in California whether the owner is in or outside California. Of these, about 150,000 are lighter trucks that do not have compliance requirements until January 1, 2015. Because fleets with trucks that are registered to operate solely in California typically operate fewer annual miles than interstate trucks, many fleet owners with heavier trucks have had to make substantial investments to comply. Staff estimates that at least 85 percent of these California-registered heavy trucks are in fleets that most likely comply with current regulatory requirements. Many of these trucks are compliant today because owners have taken advantage of flexibility provisions in the current regulation that postpone their clean-up requirements for several years; meaning many fleet owners will need to continue to make significant investments to reduce their emissions in the coming years.

With any proposed regulatory amendments there is a need to maintain clear compliance targets that ensure all Californians realize the emissions benefits originally envisioned by the regulation, and to ensure that a level playing field within the industry exists across the State. To those good actors that have already made investments to comply, providing additional flexibility can be viewed as unfair. However, many fleet owners remain challenged in meeting the compliance requirements of the regulation. In fact, about 4000 fleet owners reported 5,000 vehicles under the allowances of the good faith advisory as being in fleets where the owner was denied a loan and would likely not be able to fully comply.

In recognizing these challenges, it is critical to balance amendments that lower costs and provide additional flexibility against the costs that many compliant fleet owners have already incurred. Staff's proposed amendments strive to strike that proper balance, where the amendments afford relief equally to all fleet owners, regardless of their state of registration and target those fleet owners that would benefit from (and most need) additional flexibility, while also recognizing early actions already taken by fleet owners to comply with regulatory requirements.

3. Assessing Actions Taken to Comply, and Future Compliance Obligations

a) Compliance with 2014 Requirements

Reporting in TRUCRS is only required for fleet owners that take advantage of flexibility options in the regulation, and is not required for owners that comply with the engine

model year schedules. Vehicle registration data shows that there are more than one million trucks that are registered in California or that are in fleets that are authorized to travel in California and would be subject to the Truck and Bus regulation. As discussed above, more than 625,000 trucks are registered outside of California to fleets that report some travel in California, and these trucks most likely already meet 2014 compliance obligations.

Many California registered and non-California registered fleets have reported light and heavy trucks into ARB's reporting system, TRUCRS. As of January 31, 2014, there were nearly 178,000 compliant heavier trucks, and an additional 20,000 heavier trucks claiming good faith extensions that reported to ARB. Of this combined total about 58 percent of the trucks have or soon will be equipped with a diesel PM filter and about 42 percent are compliant because they are in fleets that have claimed flexibility options or good faith extensions and do not need a PM filter at this time. All of these trucks are owned by fleet owners that have taken action to comply. The first compliance requirements for lighter trucks start January 1, 2015; therefore, all lighter trucks are currently in compliance.

In order to better understand current compliance rates and future compliance obligations for vehicles that do not cross state lines, staff evaluated vehicle registration data from the Department of Motor Vehicles and ARB compliance reporting data at the fleet level. Staff used California vehicle registration data as of October, 2013 and compliance reporting data in TRUCRS as of January 31, 2014. Based on these data, staff estimates that at least 85 percent of all California-registered heavy trucks meet 2014 compliance obligations because they are in fleets that reported in TRUCRS and claimed compliance, or did not report to TRUCRS and are equipped with a diesel PM filter based on their reported vehicle model year in vehicle registration data.

Although vehicle registration data does not reflect truck replacements made after October 2013, it can be used to establish an upper bound estimate on the number of trucks that need to comply. Staff analysis suggests as many as 36,000 trucks that were registered with the DMV in October 2013 have not been reported to TRUCRS and may need to take steps to meet regulatory obligations in 2014 based on the registered vehicle model year and fleet composition. About half of these trucks are in small fleets. However, staff believes that many of these trucks may have already been replaced or may be able to comply by claiming flexibility options in the regulation. However, staff also expects that some may still need to meet PM requirements by installing a retrofit PM filter or upgrading their truck to come into compliance. To better understand how fleets that did not report to ARB came into compliances, staff will evaluate DMV registration date from April 2014 to determine what action fleet owners took to better understand compliance rates for 2014.

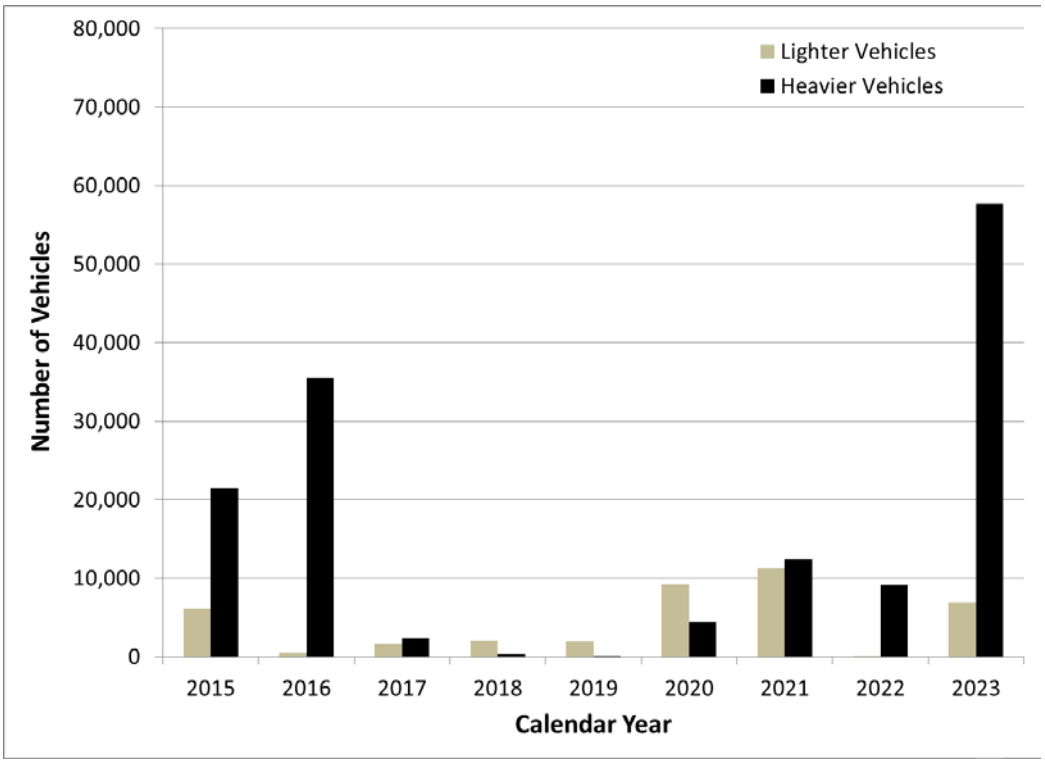
Overall, staff's analysis to date shows that most fleet owners have taken steps to meet compliance obligations and that at least 85 percent of trucks operating in California are compliant. However, staff's analysis also shows that as many as 15 percent of trucks may not be compliant, pending more up to date data. To address this, staff intends to

focus outreach and enforcement efforts on these fleets to assure the emissions benefits envisioned by the Truck and Bus regulation are achieved, and that a level playing field for compliant fleet owners is achieved. More details of the analysis are in Appendix C.

b) Compliance with Future Requirements

Looking ahead, in 2015 and 2016, fleet owners will need to take additional actions to meet compliance obligations for both light and heavy trucks. Using October 2013, registration and compliance reporting data, staff estimates there are as many as 53,000 light and heavy trucks that would need to comply in 2015, and another 28,000 light and heavy trucks in 2016 that may need to take steps to comply based on the engine model year. Again, these are upper bound estimates, because some of these trucks are expected to be replaced through normal attrition, while others would continue to be able to use some of the flexibility options in the regulation. The following Figure II-1 shows the estimated number of vehicles, based on the emissions inventory that would need to be brought into compliance from 2015 to 2023. These numbers are consistent with estimates made using recent registration and reporting data.

Figure II-1: Estimated Number of In-State Vehicle Upgrades Required with the Current Regulation



The analysis above suggests that a significant number of fleets will need to take action in the next several years to meet compliance obligations. The proposed amendments are intended to safeguard emissions reductions by providing compliance pathways to smaller fleets and those that are currently unable to comply. The additional time would

give more time for the economy to improve and would allow fleet owners to upgrade to a lower priced used truck with a 2010 model year engine or later in one step.

4. Benefits Anticipated from the Regulatory Action

The proposed amendments to the regulation would preserve to a large extent and better protect its environmental benefits. The proposed amendments continue to require all fleets operating in non-attainment areas to meet 2010 engine standard emission levels by 2023, which provides the NOx reductions necessary to help the State meet its commitment to achieve federal air quality standards. The proposed amendments would also achieve a major reduction in diesel PM emissions, helping to achieve California's goal of an 85 percent reduction in statewide exposure to diesel PM consistent with the Diesel Risk Reduction Plan. The proposed amendments do not result in any increase in emissions compared to today's existing environmental conditions, and over the life of the regulation, the proposed amendments cumulatively achieve 93 percent of the PM2.5 and NOx benefits. The proposed amendments preserve reductions in premature mortality (3,500 fewer deaths statewide attributable to PM2.5 exposure) as envisioned in the 2010 amendments, valued at billions of dollars.

Staff anticipates the amended regulation would achieve a 47 percent reduction in statewide PM2.5 emissions in 2020, and a 37 percent reduction in statewide NOx emissions in 2023, both consistent with reductions provided in the current regulation. Table II-1 compares the projected emission reductions of the existing regulation and the proposed amendments on key dates in tons per day (tpd). While this table is statewide, on a regional basis, the proposed amendments maintain the reductions required under California's U.S. EPA-approved SIPs to meet federal air quality standards in the South Coast and San Joaquin Valley federal nonattainment areas.

Table II-1: Statewide Emission Reductions of the Current Regulation Compared to the Proposed Amendments (tpd)

Year	NOx Reductions		PM2.5 Reductions	
	Existing Regulation	Proposed Amendments	Existing Regulation	Proposed Amendments
2014	57	52	6.0	5.6
2017	83	62	6.1	5.0
2020	63	70	4.2	4.2
2023	95	94	2.9	2.9

The proposed amendments would reduce the overall compliance costs of the regulation by over $400 million dollars, a 20 percent reduction in total costs of the regulation. These cost reductions are achieved by lengthening compliance requirements for small fleets, fleets operating in counties that have made substantial progress towards cleaner air, and certain lower use fleets. By lengthening compliance requirements, the amended regulation would defer some of the compliance costs for many vehicles for up to five years and would improve the ability of vehicle owners to raise the capital needed to make upgrades. The additional time also provides fleet owners additional

opportunities to take advantage of declining used compliant truck prices and public incentive programs. A more detailed discussion of the effect on emissions is presented in Chapter IV.

III. SUMMARY OF PROPOSED ACTION

Staff is proposing regulatory amendments that preserve the emissions benefits of the regulation necessary to meet California's air quality obligations under the CAA and the goals of the Diesel Risk Reduction Plan, by providing additional regulatory flexibility to small fleets, lower mileage fleets, and fleets in certain rural areas that have made substantial progress towards cleaner air. In developing the amendments, staff focused on three objectives:

- Protecting emission reductions by providing lower cost compliance options to small fleets, low mileage fleets, and fleets in certain areas with cleaner air that would result in greater levels of compliance.
- Providing new opportunities for fleet owners to access public incentive funds.
- Recognizing fleet owners that made early investments to comply.

While the loss of some original PM2.5 and NOx benefits will occur in the near term, on balance, staff believes the proposed new flexibilities are reasonable and consistent with a rebalanced compliance approach for fleet owners still suffering from the impacts of the economic recession. Additional detail on the individual amendments and the rationale is provided in Chapter VIII, and the Proposed Regulation Order is in Appendix A.

A. Providing Relief in Areas with Cleaner Air

Staff is proposing changes to the compliance options for vehicles that are operated in "NOx Exempt Areas" as defined in section 2025(d)(45) by expanding the regions that are in the definition and by extending compliance requirements contained in section 2025(p)(1) over a longer period of time. First, staff is proposing to amend the definition of NOx Exempt Areas" in section 2025(d)(45), to add the following counties: Amador, Butte, Calaveras, Eastern Kern, Inyo, Mariposa, Mono, Nevada, Northern Sutter, Tuolumne, and the portions of El Dorado and Placer that are within the Lake Tahoe Air Basin. These counties have made substantial progress towards cleaner air, hence creating an opportunity to provide additional time for realizing emission reductions. Second, staff is proposing to amend the compliance schedule for all vehicles, including out-of-state vehicles, that are operated solely within the NOx Exempt Areas (section 2025(p)(1)) when in California. The initial compliance deadline would be extended by one year and the final compliance deadline would be extended four years per the proposed schedule shown in Table III-1.

Table III-1: Proposed Compliance Schedule for NOx Exempt Area Fleets

Compliance Deadline as of January 1	Existing Regulation PM Filter Phase-in	Proposed Revised Regulation PM Filter Phase-in
2014	33%	0%
2015	66%	25%
2016	100%	40%
2017		55%
2018		70%
2019		85%
2020		100%

Small fleet owners with 3 or fewer vehicles that operate in the NOx Exempt Areas would have the option to add PM filters according to the schedule in Table III-2.

Table III-2: Proposed Optional Compliance Schedule for Small Fleets in NOx Exempt Areas

Number of Trucks	Existing Regulation PM Filter Required January 1	Proposed Revised Regulation PM Filter Required January 1
One Truck	2015	2017
Two Trucks	2014, 2016	2015, 2019
Three Trucks	2014, 2015, 2016	2015, 2017, 2019

Staff is also proposing to add a new section 2025(p)(1)(D) to clarify that vehicles that use the NOx Exempt Areas provision may travel outside of the designated NOx Exempt Areas for emergency operations, as defined in amended section 2025(d)(23).

B. Additional Time and a Lower-Cost Pathway for Small Fleets that Operate Outside NOx Exempt Areas

For small fleets (section 2025(h) in the existing regulation) that do not operate exclusively in NOx exempt areas, staff proposes to defer the compliance requirements for the second and third truck in a small fleet by one year and two years, respectively, such that the second truck must have a PM filter installed by January 1, 2016 and the third truck must have a PM filter installed by January 1, 2018. Staff is not proposing changes to the requirements for the first truck because the January 1, 2014 compliance date has passed and many small fleet owners have already complied. The existing subsections 2025(h)(2), (3), (4) would be deleted because these sections refer to past reporting dates and are no longer needed. A new definition for “Small Fleet” was added

as amended section 2025(d)(54) for clarity, and the definition of “Fleet Size” in existing number 2025(d)(30) was deleted because the fleet size definition is only needed to define small fleets. By providing this relief to the second and third trucks in small fleets, small fleet owners would be able to upgrade with lower-cost used trucks, and could be eligible for additional incentive funding. For truck owners with single truck who have not met the existing January 1, 2014 compliance deadline due to financial limitations, the amendment described in the next section could provide an alternative compliance pathway.

C. Provide an Option for Owners that Cannot Currently Comply

Staff is proposing a new flexibility option through the addition of section 2025(p)(10) that waives the PM filter requirement for up to three vehicles in a fleet if they are upgraded to 2010 model year engines or newer by January 1, 2018. To qualify, fleet owners must have been denied a loan for purposes of compliance between July 1, 2013 and December 31, 2014, and opt-in by reporting no later than January 31, 2015. This proposed amendment would help ensure air quality benefits will be achieved by providing a compliance pathway for any fleet that is unable to fully comply with regulatory requirements because they were unable to obtain a loan, and in doing so may make trucks in those fleet owners newly eligible for incentive funding. The amendment also potentially reduces compliance costs for fleet owners because they will be able to defer the purchase of a PM filter, and instead upgrade directly to an used compliant 2010 model year engine, which would also result in NOx reductions earlier than currently required.

D. Adjusted Compliance Timeline for Low-Use Work Trucks

Staff is proposing several amendments to spread out compliance requirements for fleet owners with lower use vehicles, dedicated work trucks, and certain specialized vehicles. These amendments would ensure that air quality benefits are achieved by providing additional time for these fleet owners to comply and providing a temporary exemption for the lowest use vehicles.

1. Work Truck Extension

Staff is proposing to add a new option for a wide range of low-mileage trucks that is broader than the existing low-mileage construction truck option. Staff is proposing to replace the existing low-mileage construction truck extension of section 2025(p)(2) with new language that applies to work trucks and provides an extended compliance schedule for work trucks that travel less than a total of 20,000 miles per compliance year, regardless of its weight or where the truck is operated. The mileage limit for the existing low-mileage construction truck option was added with the regulation amendments in 2010 and was set at 20,000 miles per year for dump trucks and 15,000 miles per year for other construction trucks. The proposed schedule would phase-in the PM filter requirements for low-mileage work trucks from January 1, 2015 to January 1, 2018 as shown in Table III-3 below.

Table III-3: Proposed Schedule for Low Mileage Work Trucks

Compliance Date	Existing Low-Mileage Construction Truck PM Filter Schedule	Proposed Low-Mileage Work Truck PM Filter Schedule
January 1, 2014	33%	33%
January 1, 2015	66%	40%
January 1, 2016	100%	60%
January 1, 2017		80%
January 1, 2018		100%
January 1, 2020	Subject to engine model year schedule	Subject to applicable engine model year schedule

With this change, the definition for Low-Mileage Construction Truck of existing section 2025(d)(40) would be deleted and replaced with a new definition for Low-Mileage Work Truck in amended section 2025(d)(62). This amendment would provide a lower-cost pathway to compliance for vehicles and equipment that are deployed in many vocations that demand application-specific configurations with substantial added cost.

2. Expanding the Low-Use Vehicle Exemption Until 2020

Staff is proposing to amend the existing "Low-Use Vehicle" definition in amended section 2025(d)(40) to include vehicles that operate fewer than 5,000 miles total per compliance year that would sunset January 1, 2020. The exemption would remain unchanged for vehicles that travel more than 5,000 miles per year, but can document that less than 1000 miles occurs in California. However, the existing definition would be revised to remove the annual hourly limit for vehicles that use PTO while stationary. This proposed amendment expands the number of trucks that can use the exemption temporarily for the lowest use vehicles, and as a result both defers and reduces compliance costs for these vehicles and allows fleet owners to prioritize upgrades of higher use vehicles. The sunset provision is necessary to meet the goals of the Diesel Risk Reduction Plan and mitigate impacts from continued use of engines with uncontrolled exhaust.

3. Smoothing Phase-in Requirements for Low Mileage Agricultural Vehicles

Staff is proposing to amend section 2025(m)(2) to allow agricultural vehicles that operate more than 10,000 miles per year, but less than the mileage thresholds show in Table III-4, to continue using the extension past January 1, 2017.

Table III-4: Existing Agricultural Vehicle Extension until January 1, 2017

Engine Model Year	Existing Annual Limit
2006 or newer	25,000 miles
1996 to 2005	20,000 miles
1995 and older	15,000 miles

The amendments would allow the extension to continue for vehicles that operate less than 15,000 miles per year from January 1, 2017 until January 1, 2020, and less than 10,000 miles per year from January 1, 2020 to January 1, 2023. Section 2025(m)(3) would be deleted to remove the requirement that for a vehicle to continue to continue to be covered by the extension and be able to operate past January 1, 2017, it must have operated less than 10,000 miles per year since 2011. Staff is also proposing to modify proposed section 2025(m)(6) and is proposing to add a new section 2025(m)(7) to clarify how eligibility is maintained when a vehicle is retired and how an extension may be used for a different vehicle in the fleet. This proposed amendment would reduce the annual compliance burden for agricultural trucks by allowing compliance requirements to be phased-in over a greater length of time.

4. Flexibility for Log Trucks

Staff is proposing to amend section 2025(m)(12) to allow log truck owners to make changes to the number of log trucks that are in the log truck phase-in option until January 31, 2015. This change would provide more flexibility to take advantage of other amended options that may be more favorable to the owner. In addition, staff is proposing to amend section 2025(m)(12)(B) by deleting the language about rounding that is already addressed in the regulation and replacing it with clarifying language on how log trucks that are counted towards the log truck phase-in option cannot be double counted with determining compliance in conjunction with other compliance options.

5. Providing Relief for Cattle Livestock Trucks

Staff is also proposing to amend existing section 2025(m)(11) to add cattle livestock trucks to the specialty agricultural truck extension while deleting language that is no longer needed to limit the number of agricultural specialty truck extensions that were initially approved. The language regarding the limits on the number of specialty trucks that could be approved in 2011 is no longer needed because the number of specialty truck extensions in a fleet cannot be increased from year to year. Staff is also proposing to allow cattle livestock truck owners to claim the extension by reporting prior to January 31, 2015, without limiting the number of cattle livestock trucks that can be added provided the other criteria to use the extension are met. A new specialty truck category for a cattle livestock truck is proposed to be added in amended section 2025(d)(55)(F). Cattle livestock trucks are owned by ranchers and a limited number of haulers that drive seasonally in and out of California; however, most of these miles are driven in rural areas with cleaner air. This proposed change would recognize that while in-state and out-of-state cattle livestock haulers typically operate more miles than are

permitted under the low mileage agricultural vehicle provisions, as provided in section 2025(m)(2), they are being significantly impacted by market conditions, and that mileage from these trucks in California is likely to be significantly depressed for several years.

6. Providing Flexibility for Heavy Cranes

Staff is proposing to add a new compliance option for heavy cranes in a new amended section 2025(n)(2). A new definition for "Heavy Crane" is proposed in section 2025(d)(33). The proposed schedule would require heavy cranes to be upgraded to 2010 model year or newer engines at a rate of 10 percent of the heavy cranes in the fleet per year from January 1, 2018 to January 1, 2027. The proposed schedule is shown in Table III-5. A crane owner with one heavy crane would have until 2022 to upgrade to a 2010 engine. Staff is also proposing to provide credit for heavy cranes that are equipped with a retrofit or OEM PM filter before January 1, 2018 by counting such cranes towards meeting the proposed 2010 engine requirement. This credit would recognize crane owners that have already retrofitted or upgraded to newer cranes. These cranes would also be exempt from the replacement requirement. This option would recognize the high cost of replacing heavy cranes and the added complexity for retrofitting existing cranes and meeting crane safety certification standards.

Table III-5: Proposed Heavy Crane Phase-in Option

Compliance Deadline as of January 1	Required Crane Fleet Upgrades to 2010 Model Year Engines			
	1 Crane Owner	2 Crane Owner	3 Crane Owner	4 or More Cranes
2018				10%
2019			1	20%
2020		1		30%
2021				40%
2022	1		1	50%
2023				60%
2024				70%
2025		1		80%
2026			1	90%
2027				100%

7. Smoothing out Regulatory Compliance Requirements

Staff is proposing to amend section 2025(f)(3) to allow owners of lighter vehicles to use the amended "NOx Exempt Areas Phase-in Option" of section 2025(p)(1)(B) and the proposed "Work Truck Phase-in Option that is described in newly amended section 2025(p)(2). Also, staff is proposing to delete the text of section 2025(f)(4) that is no longer needed and to replace it with language to add a new compliance option that

would set an upper limit of 25 percent on the number of vehicles in a fleet that would need to be upgraded with a 2010 model year engine in any given year starting January 1, 2015. Staff is proposing similar changes for heavier trucks in a new section 2025(g)(7). These changes would provide additional compliance options for fleet owners that have a high percentage of older trucks, which tend to be lighter vehicles, that would need to be upgraded beginning in 2015.

E. Recognizing Early Actions Already Taken by Fleet Owners to Comply

1. Extending the Use of Existing PM Filter Retrofits

Staff is proposing to amend section 2025(f)(2) and 2025(g)(4) to extend the compliance period from January 1, 2020 until January 1, 2023 for any engine that was retrofitted with a PM filter prior to January 1, 2014, provided that the owner reports by January 31, 2015. For clarity, the same language would be added in the Small Fleet Option section 2025(h) in a new subsection 2025(h)(7).

2. Extending the use of Credits with the PM Filter Phase-In Option

Staff is proposing to amend the existing compliance option in section 2025(i) and associated sections in 2025(j) to extend the use of various compliance credits until January 1, 2020. In addition, staff is proposing to extend the use of downsizing credits in existing section 2025(j)(1), credits for early PM retrofits in existing section 2025(j)(2)(A), and credit for early addition of engines with OEM PM filters in existing section 2025(j)(3) until January 1, 2018. Staff is also proposing to amend section 2025(j)(2)(B) to extend the credit for adding alternative fueled vehicles and pilot ignition engines until January 1, 2018, and to extend the use of credits until January 1, 2020 for "Advanced Technology Vehicles" that are newly defined in amended section 2025(d)(4). The proposed changes would better allow fleet owners that have not fully recovered from the recession to have more time to comply, would recognize the actions fleet owners took to comply early, and would continue to encourage owners to upgrade to alternative fueled or advanced technology vehicles.

3. Addressing Compliance for a PM Filter Retrofit that is Recalled

Staff is proposing to add a new section 2025(q)(2)(C) to extend compliance for a retrofit PM filter that is recalled after the PM filter is installed and is not repaired or replaced by the manufacturer. The new section would allow vehicle owners that have installed a retrofit PM filter that becomes subject to a recall (as defined in Title 13, CCR Section 2701 (a)(35)) to continue operating the vehicle in the appropriate configuration up to five years from the date of the recall. This amendment would recognize the efforts of fleet owners to comply on time.

4. Minor Changes

Staff is proposing minor amendments to section 2025(d) and to modify existing definitions and define new terms that are associated with the amendments outlined above. Staff is also proposing to modify other sections to clarify existing requirements

and improve enforceability of the regulation and update reporting and recordkeeping requirements.

IV. AIR QUALITY

This chapter describes how the proposed amendments continue to achieve needed emissions reductions, reduce localized risk from exposure to carcinogenic diesel PM, reduce impacts of diesel engine emissions on mortality and other health effects and meet SIP commitments to meet federal air quality standards.

A. Need for Emission Reductions

1. Reducing Risk Exposure

Diesel PM as a component of ambient PM2.5 is a significant public health concern throughout the state. In August 1998, the ARB identified particulate emissions from diesel-fueled engines as a toxic air contaminant. It is, by far, the largest contributor of known ambient air toxics cancer risk in California (ARB, 2009).

Following the identification process, in September 2000 the ARB approved the Diesel Risk Reduction Plan, paving the way for the development of control measures designed to reduce toxic diesel PM emissions. Through this plan, staff identified strategies including air toxics control measures and other regulations, to reduce statewide diesel emissions by 75 percent by 2010, and by 85 percent by 2020. The goal of each regulation is to make diesel engines as clean as possible to reduce PM emissions and their associated cancer risk. The regulation is a critical piece of the Diesel Risk Reduction Plan, heavy duty trucks are the largest source of diesel PM emissions in California. Failure to obtain substantial reductions in diesel PM from trucks and buses will likely mean the overall goals of the Diesel Risk Reduction Plan will not be met. The amended proposal would continue to meet these goals.

2. Meeting National Ambient Air Quality Standards

U.S. EPA has established health protective National Ambient Air Quality Standards (NAAQS or standards) for a number of criteria pollutants, including ozone and PM2.5. In 1979, U.S. EPA adopted a 1-hour ozone standard. In 1997, U.S. EPA adopted a set of PM2.5 standards, an annual and a 24-hour standard, plus an 8-hour ozone standard. U.S. EPA is required to periodically review the standards to ensure they are protective of public health. And as a result, based on more recent scientific information on the health impacts of ozone and particulate matter, U.S. EPA tightened the 24-hour PM2.5 standard in 2006, the 8-hour ozone standard in 2008, and the annual PM2.5 standard in 2012.

States with areas that do not meet these standards must develop SIPs with enforceable measure to meet the standards by specific deadlines. Two regions in California–the South Coast Air Basin (South Coast) and the San Joaquin Valley Air Basin (San Joaquin Valley) are designated nonattainment for both the annual and 24-hour PM2.5 standards and the 1-hour and both 8-hour ozone standards.

Both regions are required to attain the 1997 annual PM2.5 standard of 15 µg/m3 in 2014 and the 1997 8 hour ozone standard of 80 ppb in 2023. The South Coast must attain the more stringent 24-hour PM2.5 standard of 35 µg/m3 in 2014, and the San Joaquin Valley must attain this standard in 2019. In addition, the South Coast must attain the 1-hour ozone standard by 2022 and the San Joaquin Valley must attain the standard in 2017.

In 2007 and 2008, the State adopted SIPs for the 1997 PM2.5 and 8-hour ozone standards for both the South Coast and the San Joaquin Valley. U.S. EPA approved the PM2.5 SIPs in 2011 and ozone SIPs in 2012 (ARB, 2011). In 2013, the State adopted the South Coast and the San Joaquin Valley SIPs for the 2006 24-hour PM2.5 standard and updated SIPs for the 1-hour ozone standard. U.S. EPA action on these SIPs is pending. Development of SIPs for the most recent ozone and PM2.5 standards is underway now.

All of these plans, those SIPs that U.S. EPA has already approved as well as SIPs pending approval, rely on the emission reductions in each of the attainment years from the State's Truck and Bus regulation to meet the NAAQS. For the South Coast, the attainment years are 2014, 2022, and 2023. For the San Joaquin Valley, the years are 2014, 2017, 2019, and 2023.

3. Impact on NAAQS Attainment in South Coast and San Joaquin Valley

U.S. EPA has approved California's SIPs for the Couth Coast and San Joaquin Valley that rely on the emissions reductions from the current rule. Staff has therefore designed the proposed amendments to maintain the air quality benefits and satisfy the federally-enforceable SIP commitments for emissions reductions in these two regions while maximizing flexibility in rural areas of the State. As a result, so to comply with the approved SIPs, the emissions impacts in these two regions very limited.

The loss of emission benefits of the proposed amendments begin in 2014, increase modestly for several years, and then diminish to zero compared to the current regulation. With regard to the 2014 attainment year, there is a small increase in NOx truck and bus emissions, about 1 percent or about 1 tpd, in both areas with the proposed amendments compared to the current regulation. For PM2.5 in the same attainment year, the proposed amendments would increase emissions by less than 0.1 tpd in both South Coast and San Joaquin Valley compared to the current regulation. By the 2019 attainment deadline and through 2023, staff's analysis indicates that emissions with the proposed amendments are the same as with the current regulation.

Measured air quality data show that the South Coast already met the annual PM2.5 NAAQS in 2013, one year ahead of the deadline. The incremental increase in forecasted NOx and PM2.5 emissions for 2014 will not impact attainment of the annual standard in the South Coast since, even with this change, 2014 emissions will be below the 2013 levels when the region achieved the standard.

South Coast is also close to meeting the 24-hour PM2.5 standard. The limited increase in NOx and PM2.5 included in the amendments provides a more flexible regulatory approach, while still ensuring further improvement in ambient air quality and thereby maintaining the region's ability to achieve the standard in 2014. Further, the slight increase in emissions will be made up for within one year with fleet turnover and regulation implementation.

Weather conditions in the San Joaquin Valley this last December and January have been very conducive to PM2.5 formation and high levels above the standard have been measured frequently. As a result, for the region to attain the annual PM2.5 standard this year, the remainder of 2014 will need to be especially clean. The emissions impacts of the proposed amendments are small, less than 1 tpd of NOx and less than 0.1 tpd of PM2.5. In light of these recent conditions, the proposed amendments would not have any appreciable impact on whether or not measured PM2.5 levels for the remainder of the year are low enough for the 3-year average to meet the standard. However, the amendments represent the maximum emission increases that can be provided while still ensuring expeditious progress towards attainment.

The next critical SIP attainment deadline is 2017 for the 1-hour ozone standard in the San Joaquin Valley. With the proposed amendments, staff forecasts that NOx emissions will be approximately 5 tpd higher than with the current regulation. However, emissions would remain at or below the level that would provide for attainment by 2017. Therefore, there is no expected impact on 1-hour ozone SIP for the San Joaquin Valley.

Finally, by 2019 and beyond, emission levels with the current regulation and the proposed amendments are the same or lower. None of these changes in these latter years would have any impact on attainment, the SIPs for San Joaquin Valley 24-hour PM2.5 in 2019, South Coast 1-hour ozone in 2022, or either South Coast or San Joaquin Valley 8-hour in 2023.

B. Impact on PM Mortality

In the amendments adopted by the Board in 2010, staff estimated that 3,500 premature deaths (2,700 to 4,400, 95 percent confidence interval) would be avoided between 2010 and 2025 by implementation of the amended regulation. The proposed amendments also would have little impact on the overall emissions benefits achieved, and in fact would better ensure the anticipated reductions occur; therefore, the health impacts are not expected to change significantly and are within the margin of error of the mortality calculations.

C. Impact on Localized Risk

The proposed amendments continue to reduce PM emissions from trucks and buses by the maximum feasible amount, and would achieve significantly lower diesel PM emissions than baseline conditions without the regulation. The proposed amendments focus the greatest relief on small fleets operating in the more rural portions of California, while maintaining maximum near-term risk reduction in the most populated regions of

the State. The regulation ensures that by 2020 nearly every truck operating in California will have a PM filter, consistent with the goals of the Diesel Risk Reduction Plan to achieve the maximum feasible PM reductions.

D. Analysis of Climate Change Co-benefits

Black carbon (BC) – a major constituent of diesel PM – contributes to climate change, both directly by absorbing sunlight and giving off heat, and indirectly by depositing on snow and accelerating snow melt or by interacting with clouds and affecting cloud formation. Black carbon also causes regional climate change through its contribution to warming and its suppression of precipitation. California may be especially vulnerable to the climate effects of BC. Global warming affects summer water supplies in California that rely predominantly on runoff from mountain snowpack located within the State as well as in the Rocky Mountains (via the Colorado River). Furthermore, a warmer atmosphere over already dry regions, combined with less mountain runoff during the summer months, enhances conditions conducive for wildfires. This increase in the number and intensity of wildfires adds to the number of black carbon particles, further increasing the attendant climate impacts.

Unlike longer-lived greenhouse gases, BC has a very short atmospheric lifetime, only a week or two. Consequently, it has a strong correlation with regional emission sources and, correspondingly, its emission reductions have immediate climate and public health benefits (UNEP and WMO, 2011; Shindell, 2012). A recent review suggests that BC is the second most important human-caused emission in terms of its climate forcing in the present-day atmosphere; only carbon dioxide (CO_2) is estimated to have a greater climate forcing (Bond, 2013). Therefore, reducing diesel PM and the corresponding BC emissions provides immediate reductions in pollution exposure as well as near-term climate benefits, complementing efforts to reduce CO_2 emissions.

Since BC concentrations vary spatially, it is difficult to quantify its global warming potential (GWP), and there are significant variations in the GWP values for BC emissions assigned to different regions. Regional differences in atmospheric BC concentrations, and hence the warming effects of BC, depend upon the regional climate, radiation properties, and deposition pathways. (Bond, 2013) conclude that the GWP value varies by about ±30 percent between emitting regions.

Bond et al. recommend a global mean BC GWP of 900 for the 100-year time horizon commonly used in calculating CO_2 equivalent benefits (Bond, 2013). This should be considered a conservative estimate for fossil fuel BC forcing in California, as a 20-year time horizon (GWP of 3,200) gives a better perspective on the speed at which BC controls will impact the atmosphere relative to CO_2 emission controls.

The largest source of BC emissions in California is diesel exhaust (Chow, 2010). According to ARB estimates, annual emissions of elemental carbon (a surrogate for BC) in California decreased about 70 percent between 1990 and 2010, in direct proportion to declining DPM emissions. As the regulation is fully implemented, and given the

replacement of older heavy-duty diesel vehicles with newer and cleaner vehicles, California should continue to see a major decline in atmospheric concentrations of BC.

Converting diesel PM emission reductions to BC estimates requires BC/PM emission ratios derived from motor vehicle emission tests and on-road studies. The recommended BC/PM ratios for heavy-duty diesel trucks and buses are 0.60±0.05 for pre-2007 technologies and 0.15±0.05 for 2007 and later technologies. Combining with the BC GWPs previously discussed, the cumulative climate warming reduction of the existing Truck and Bus regulation for 2010-2025 is about 11.1 and 39.6 million metric tons of carbon dioxide equivalents ($MMTCO_2e$) for the 100-year and 20-year time horizons, respectively.

Estimates of the cumulative BC warming benefit for the newly proposed Truck and Bus regulation for 2010-2025 are about 10.3 and 36.6 $MMTCO_2e$ for the 100-year and 20 year time horizons, respectively. Therefore, the newly proposed amendments to the Bus and Truck regulation will not significantly impact the cumulative 2010-2025 climate benefits from the existing regulation, and are well within the more than 30 percent uncertainties for the calculations.

E. Emissions Inventory

1. Updates to Truck Emissions Inventory

The ARB heavy-duty truck and bus emissions inventory has evolved over time. A major revision to the inventory was made in 2010 in conjunction with previous amendments to the regulation. The revisions reflected the reduction in fuel use and activity, as well as changes to new vehicle sales patterns, which were the result of the 2008-2009 economic recession (ARB, 2010). Ultimately these updates were incorporated into ARB's current on-road mobile source emissions model, EMFAC2011. EMFAC2011 reflects trucking population, activity, and emissions in a variety of vehicle registration, body type, weight class and vocational categories (ARB, 2013). The emissions analysis methodology and results are described in Appendix F.

For this analysis, inputs to EMFAC2011 were updated, including fuel sales data, truck sales data, improved matching of engine and truck model years, and regulation compliance assumptions. Extended effects of the economic recession are evident in these data updates, which are summarized below.

a) Updated VMT Based on New Fuel Sales and Use Data

In the 2010 regulation inventory, staff used trends in historical fuel sales and use data as a surrogate for historical VMT trends and then forecasted VMT assuming the recovery would begin in 2010 and grow at a rate roughly consistent with forecasted transportation and warehousing employment that was published in several economic studies at that time. Since that time the growth rate in fuel use has been lower than projected. For this update, staff used trends in up-to-date (2013) fuel sales and use data published by the Board of Equalization, which show little or no growth in taxable diesel fuel sales since 2009. Staff used trends in the new data up to 2013 to represent

historical VMT growth, then, starting in 2014 and beyond, assumed the same economic recovery trend that was previously assumed in the 2010 regulation inventory.

b) Updated Fleet Age Distributions Based on New Vehicle Sales Data

New truck sales are used in the calculation of truck age distribution for each fleet. For this update, staff used the latest nationwide truck sales projected in the Annual Energy Outlook published by the U.S. Energy Information Administration (Annual Energy Outlook Projected Sales). Following the same approach used in the 2010 regulation inventory, staff used scalars based on the revised California VMT (above) to nationwide VMT as a California-specific adjustment to the nationwide truck sales data. The California specific sales data estimate was then used to develop California specific fleet age distributions.

c) Improved Matching of Engine and Truck Model Years

Truck populations in the emissions inventory are based on the analysis of California Department of Motor Vehicle (DMV) registration and International Registration Plan submittals. Both data sources provide vehicle information with vehicle model year. However, the data collected to develop emission rates was based on engine model year. Previously, staff made minor adjustments to account for the miss-match between vehicle model year and engine model year. However, the latest data collected through the Drayage Truck Registry indicates that engine model years are about 1 year older for the majority of late model year trucks and the existing adjustments do not adequately account for this difference, especially for trucks with combined diesel PM filter and selective catalytic reduction systems. To account for this issue in this update, staff shifted the truck model year by one year (older). This shift better represents engine model year emission factors in the calculation of emissions.

d) Updated Regulation Compliance Assumptions

When the regulation was amended in 2010, staff assumed the owners would choose to comply with the regulation by following the engine model year compliance schedule and few would use credits for downsizing or early diesel PM filter compliance. Over the past 2 years, information has become available on how truck owners are actually complying. In order to use phase-in options or take advantage of other flexibility provisions and credits, truck owners need to report to the Truck Regulations Upload and Compliance Reporting System (TRUCRS). Truck and fleet data collected in TRUCRS shows that owners are using credits and flexibility provisions to demonstrate compliance for as many as 50 percent of trucks in some fleet categories. For the 2010 inventory, staff assumed owners would choose to comply by retrofitting their existing trucks prior to 2015. However, this recent information indicates some owners prefer to replace their existing trucks with ones that have OEM PM filters rather than installing retrofits on their existing trucks.

In this revision, this new information about the fraction of trucks complying via credits or provisions and the fraction of trucks that have complied by purchasing 2007 engine trucks are reflected in the current regulation and proposed amendment.

2. Emissions Inventory Results

NOx and diesel PM2.5 emissions inventory results, including the updates described above, are provided below. NOx emissions contribute to ambient ozone concentrations while both NOx and directly emitted PM2.5 emissions contribute to ambient PM2.5 concentrations. The reduction in the relative contribution of trucks and buses to the mobile source NOx and diesel PM inventory between 2010 and 2014 is a result of implementation of the Truck and Bus regulation, and shows the importance of continuing to implement the regulation.

In 2010, prior to the implementation of the Truck and Bus and Drayage Truck regulations, trucks subject to these regulations were the single largest statewide contributors to mobile source emissions. As shown in Figure IV-1, the truck and bus fleets represent more than 40 percent of diesel PM and 30 percent of NOx from all mobile sources. With the implementation of the Truck and Bus and Drayage Truck regulations, and revisions to the inventory, in 2014 these vehicles are a smaller but still significant contributor to emissions. As shown in Figure IV-2, in 2014 trucks and buses represent 26 percent of all diesel PM2.5 emissions, while also contributing 22 percent of total NOx from all mobile sources.

Figure IV-1: 2010 Statewide Mobile Source Emissions (Diesel PM and NOx without Adopted Truck and Bus Regulations)

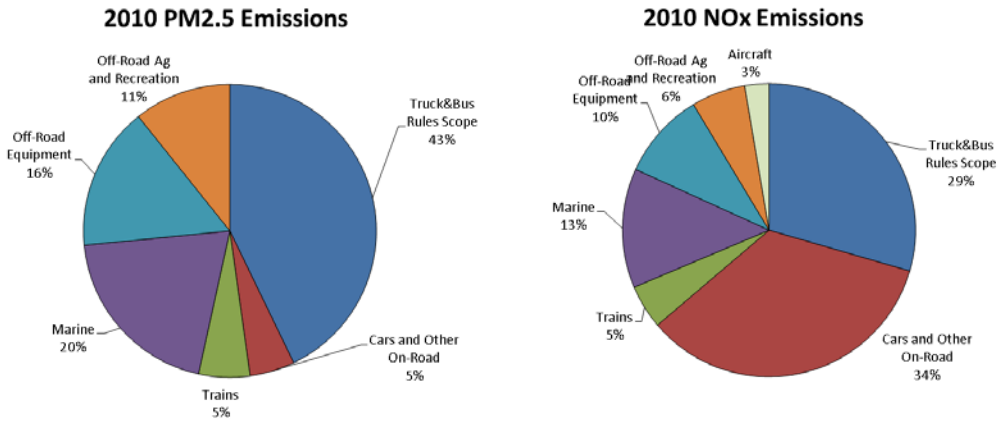
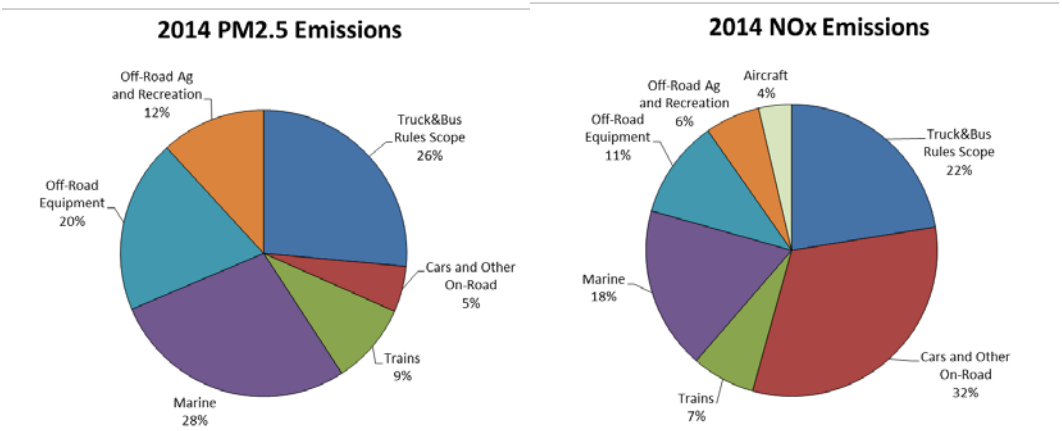


Figure IV-2: 2014 Statewide Mobile Source Emissions (Diesel PM and NOx with Adopted Truck and Bus Regulation)



3. Emissions Impacts from the Proposed Amendments

Staff anticipates the proposed amendments to the regulation will reduce diesel PM emissions by 39 percent from baseline (without the regulation) levels in 2014 and that practically all trucks operating in California will be equipped with a diesel PM filter by 2020. Staff also anticipates the amended regulation will achieve a 37 percent reduction in statewide NOx emissions in 2023. The revised baseline emissions (without regulation) and remaining emissions (with the proposed amendments) in the calendar years relevant to attainment of federal clean air quality standards are shown below in Table IV-1 (including the updates described in Section E-1).

Table IV-1: Reductions in Statewide NOx and PM Emissions from the Proposed Amendments (tpd)

Year	NOx Emissions			PM Emissions		
	Without Regulation	Proposed Regulation	Reductions	Without Regulation	Proposed Regulation	Reductions
2014	403	351	52	14.3	8.7	5.6
2017	330	268	62	10.9	5.9	5.0
2020	281	211	70	8.8	4.6	4.2
2023	250	156	94	7.4	4.5	2.9

Table IV-2 below compares the reductions of the current regulation as adopted in 2010 and the proposed amendments. Both scenarios reflect the updates described in Section E-1. As can be seen, the PM benefits of the proposed amendments are lower in 2014 and 2017. However, since most of the new provisions still require trucks to have diesel PM filters equipped by 2020 as in the current regulation, the reductions become identical in 2020.

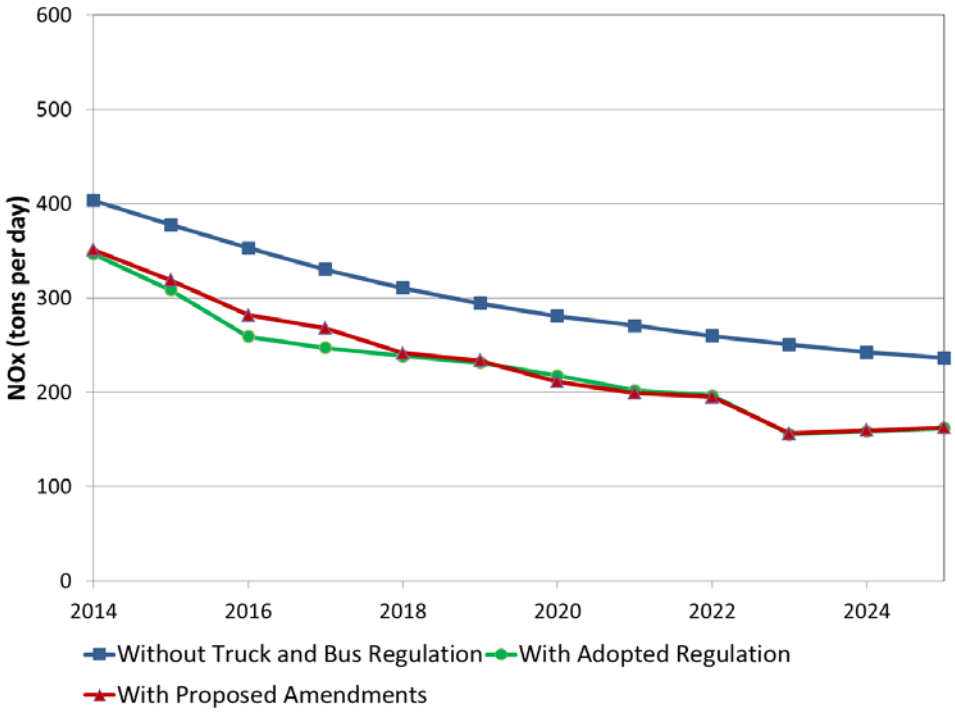
Table IV-2: Statewide Reductions of the Current Regulation Compared to the Proposed Amendments (tpd)

Year	NOx Reductions		PM Reductions	
	Existing Regulation	Proposed Amendments	Existing Regulation	Proposed Amendments
2014	57	52	6.0	5.6
2017	83	62	6.1	5.0
2020	63	70	4.2	4.2
2023	95	94	2.9	2.9

The NOx reductions of the proposed amendments are lower than the existing regulation in 2014 and 2017, are greater in 2020, and nearly identical in2023. The proposed amendments provide additional time between 2014 and 2017 which reduces PM emissions reductions. However, these trucks must still meet PM requirements and are much more likely to meet those requirements in 2020 by purchasing a 2010 truck. As a result, 2020 emission reductions are slightly greater in the proposed amendments. By 2023 emissions reductions for both scenarios are very similar because the existing regulation requirements in 2023 are unchanged by the proposed amendments.

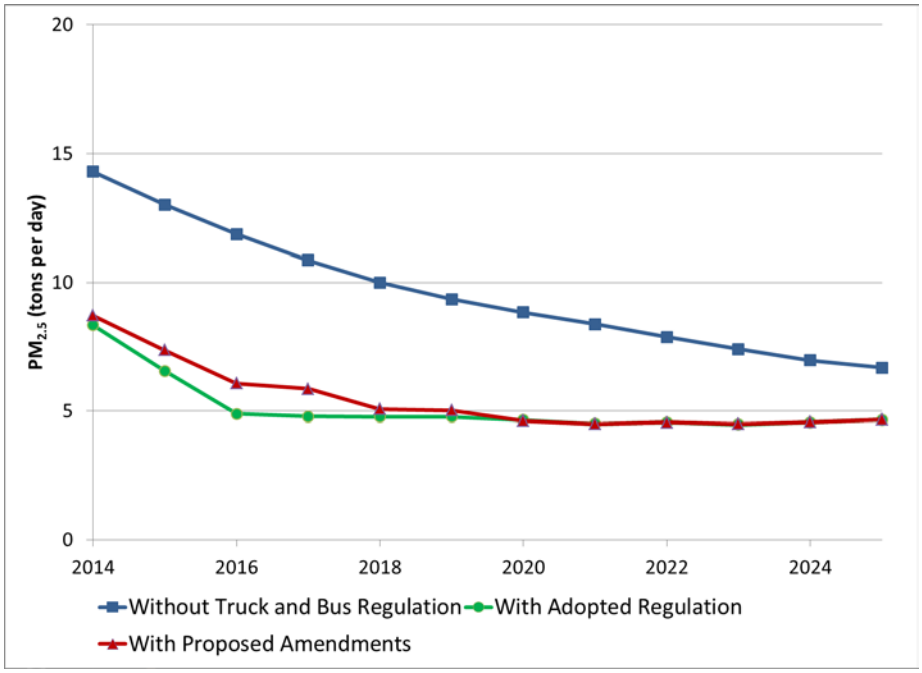
Figure IV-3 and Figure IV-4 below compare the statewide NOx and PM2.5 emissions trends without the regulation (baseline), with the current regulation, and with the proposed amendments. As shown in both the NOx and PM2.5 emissions comparison, the proposed amendments will achieve the same level of NOx remaining emissions around 2018, and PM remaining emissions in 2020. Overall the proposed regulation amendments achieve 93 percent of the PM and NOx emissions reductions originally envisioned in the 2010 amendments.

Figure IV-3: Statewide Truck and Bus NOx Emissions*



*Vehicles subject to the Truck and Bus and Drayage Truck regulations

Figure IV-4: Statewide Truck and Bus PM2.5 Emissions*



*Vehicles subject to either the Truck and Bus or Drayage Truck regulations

4. Estimated Number of Trucks to Be Upgraded

Figure IV-5 shows the number of heavier trucks from the inventory model that would be upgraded (retrofitted or replaced) each year to comply with the current regulation and the proposed amendments. The number of upgrades in both cases, excludes normal replacements that would have occurred with no regulation. The proposed amendments would defer the clean-up of vehicles in 2015 and 2016 and would spread out compliance more evenly each year until 2020. The increase in 2020 is a result of the replacement requirements that start for fleets that used the various flexibility options and the sunset of the 5000 mile low-use exemption. For a number of reasons, this would likely be lower because staff did not model the following:

- The proposed 25 percent cap on the number of replacements per year would spread out compliance.
- Fleet owners may upgrade trucks earlier than required
- A number of older trucks could be kept below the 1000 miles per year threshold.

Similarly the number of replacement for lighter trucks is shown in Figure IV-6. Lighter vehicles are not required to be retrofitted and until 2020, do not have requirements if the engine is less than 20 years old. Beginning January 1, 2015, a high fraction of these 20 year old or older trucks are expected to operate less than 5,000 miles per year and would also be able to use the low-use exemption. In 2020, the model year schedule requires more vehicles to be cleaned up than prior years, and the 5000 mile low-use exemption would sunset. The projected increase in 2020 would also be expected to be lower for the same reasons described for heavier vehicles.

The deferred timelines also increase the need for ARB to work with fleet owners, and local air districts to deploy cleaner trucks before they are required and in assisting fleet owners to understand their compliance options and to ensure compliance.

Figure IV-5: Number of Heavier Trucks to Be Retrofitted or Replaced

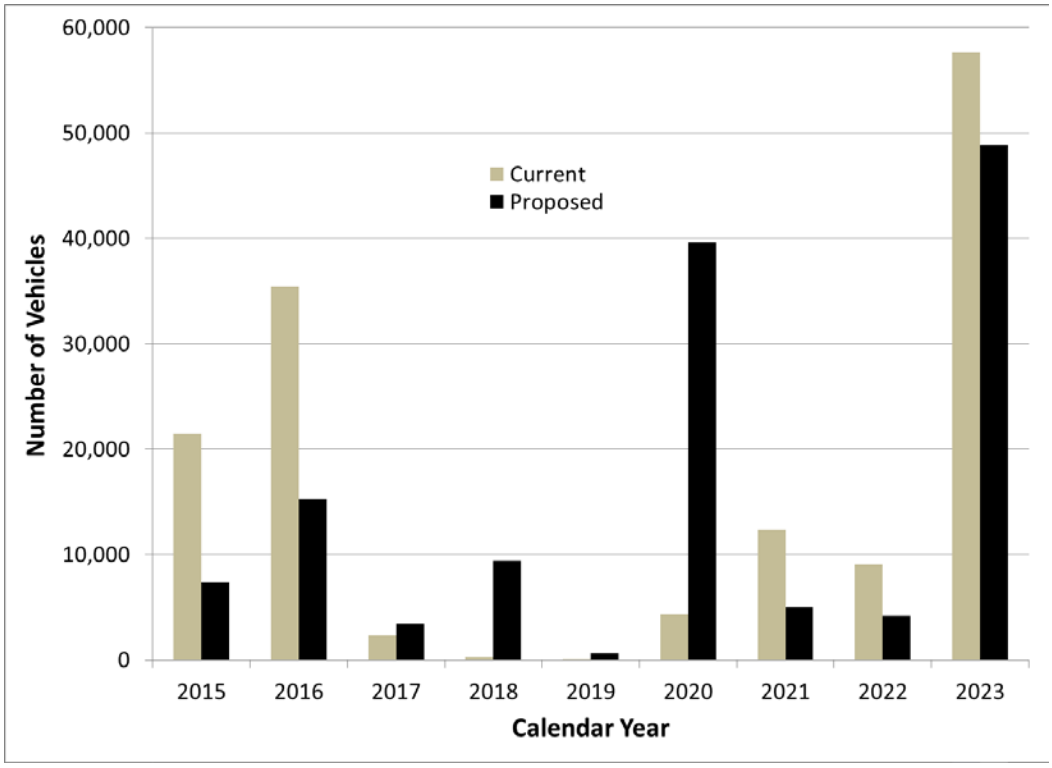
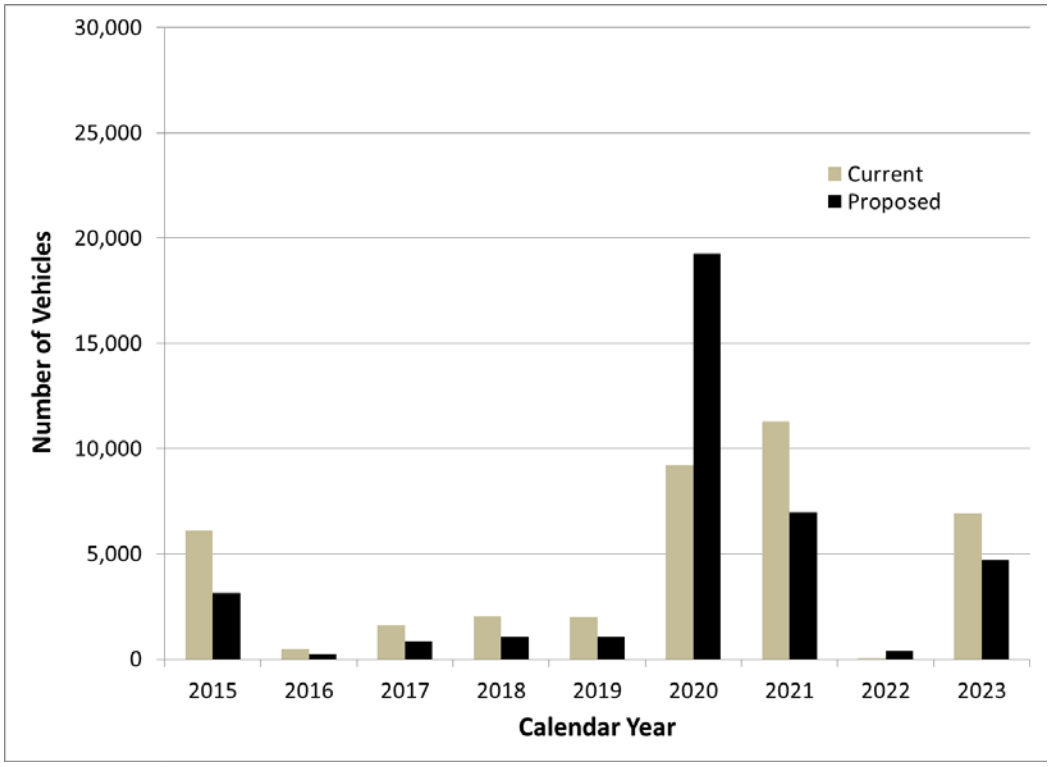


Figure IV-6: Number of Lighter Trucks to Be Replaced



F. Conclusion

The proposed amendments will protect the anticipated emissions reductions from the regulation, and provide four key benefits. First, the goals of the Diesel Risk Reduction Plan will continue to be met by reducing localized health risks associated with exposure to diesel PM. Second, the regulation will continue to provide NOx reductions necessary to meet State commitments associated with attaining state and federal air quality standards. Third, the amended regulation preserves the reduction in premature mortality caused by exposure to ambient PM2.5. Finally, the regulation continues provides significant climate change benefits by reducing black carbon emissions.

V. ENVIRONMENTAL IMPACTS ANALYSIS

A. Introduction

This chapter provides an environmental analysis for the proposed regulatory amendments. Based on ARB's review, staff has determined that implementing the proposed amendments to the regulation would not result in an adverse impact on the environment. This analysis provides the basis for reaching this conclusion. This section of the Staff Report also discusses environmental benefits associated with the proposed amendments (17 California Code of Regulations (CCR) 60005 (b)).

B. Environmental Review Process

ARB is the lead agency for the proposed regulatory amendments and has prepared this environmental analysis pursuant to its regulatory program certified by the Secretary of the Natural Resources Agency (14 CCR 15251(d); 17 CCR 60000-60008). In accordance with Public Resources Code section 21080.5 of the California Environmental Quality Act (CEQA), public agencies with certified regulatory programs are exempt from certain CEQA requirements, including but not limited to preparing environmental impact reports, negative declarations, and initial studies (14 CCR 15250). ARB has prepared this environmental analysis to assess the potential for significant adverse and beneficial environmental impacts associated with the proposed regulatory amendments as required by ARB's certified regulatory program (17 CCR 60005(b)). The resource areas from the CEQA Guidelines Environmental Checklist were used as a framework for assessing significant impacts (17 CCR 60005(b)).

If comments received during the 45-day public review period raise significant environmental issues, staff will summarize and respond to those comments in writing prior to final action on the proposed amendments (17 CCR 60007(a)). If the proposed amendments are approved, a Notice of Decision will be posted on ARB's website and filed with the Secretary of the Natural Resources Agency for public inspection after the regulations are finalized and submitted to the Office of Administrative Law (17 CCR 60007(b)).

C. Prior Environmental Analysis

ARB initially adopted the regulation in 2008 to, among other things, reduce the public's health risk exposure to diesel PM, an identified toxic air contaminant, and to meet the NAAQS established by U.S. EPA for PM2.5 and ozone by 2014 and 2023 respectively. The regulation requires diesel trucks and buses that operate in California to reduce emissions of diesel PM, NOx, and other criteria pollutants. The emission reductions are achieved through either of the following: 1) installation of VDECS or PM filters on existing engines, 2) replacing vehicles with newer ones having cleaner engines, or 3) repowering vehicles with newer, cleaner engines. These reductions are necessary to meet State and federal air quality standards, to reduce premature deaths attributable to exposure to PM2.5, and to reduce exposure to diesel PM in support of the Diesel Risk Reduction Plan adopted by the Board on September 30, 2000.

The regulation was amended in 2010 to respond to the economic recession that was not anticipated when the regulation was first adopted. The 2010 amendments, based on updated emissions inventories from trucks that reflected the impact of the recession on emissions, provided additional flexibility and economic relief to fleet owners, while continuing to meet the Board's air quality goals and objectives.

Chapter I of this Staff Report describes the regulatory background in more detail. The Staff Reports prepared for the original regulation and subsequent amendments did not identify any adverse environmental impacts.

D. Proposed Amendments

1. Description

The proposed amendments to the Truck and Bus regulation will provide additional flexibility for fleet owners that are adversely affected by the economy, while taking into account that emissions remain lower than originally expected as a result of the recession. As described in Chapter VIII, Section D of the Staff Report, the proposed amendments include the following changes:

- A longer-phase-in period for PM requirements for trucks operated exclusively in certain rural areas with cleaner air
    - Expand the number of regions defined as NOx exempt areas
    - Extend the compliance schedule
- Additional time and a lower cost pathway for all small fleet owners
    - Defer the clean-up of the second and third truck to 2016 and 2018
- A compliance pathway for owners currently unable to qualify for a loan to finance compliance
    - Allow up to three trucks to be replaced by January 1, 2018, with 2010 model year engines instead of fulfilling PM filter requirements.
- Adjusted schedules for low-use vehicles and certain vocational trucks
    - Expand the extension for construction trucks to include other work trucks that travel less than 20,000 miles per year.
    - Extend the use low-mileage agricultural vehicles to 2023 if the annual mileage is reduced to 15,000 starting January 1, 2017 and 10,000 starting January 1, 2020.
    - Allow cattle livestock trucks to be defined as specialty agricultural vehicles and be exempted from the PM filter requirement until 2023.
    - Expand the definition of low-use vehicles to include vehicles that operate a total of less than 5,000 miles per year and remove the PTO limit.
    - Allow heavy cranes to phase-in 2010 model year engines at a rate of 10 percent per year starting 2018.
- Recognition of fleet owners that took early action to comply
    - Extend certain current credit provisions for up to 2 years
    - Allowing a truck replacement extension to 2023 if retrofitted by 2014.

- Limit annual replacements with 2010 model year engines to two trucks or 25 percent of the vehicles in a fleet (whichever is higher).

2. Methods of Compliance

The methods of compliance with the proposed amendments are the same as those expected from the original regulation as amended in 2010; the proposed amendments do not impose any new requirements to retrofit or replace existing equipment beyond what is already required by the current regulation. In light of the recent recession and economic hardship experienced in California, the proposed amendments include provisions that would allow for additional flexibility and extend certain deadlines (further described in Chapter VIII, Section D of the Staff Report) that will ultimately facilitate compliance with this regulation and better ensure the environmental benefits of this regulation are met.

E. Environmental Impacts

1. Air Quality Benefits

The regulation, as amended by the proposed amendments, would result in incremental, temporary, changes to implementation of the regulation; nonetheless, the proposed amendments will ultimately result in the same air quality benefits projected for the regulation when amended in 2010.

Because the proposed amendments would provide an adjusted schedule and/or relax some requirements as described in Chapter VIII of this report, staff projects a temporary delay in some emission benefits in the near term (until 2020) compared to emission benefits that may have been achieved absent the proposed amendments. The impact of the expected delay in emission benefits is minimized by the fact that overall emissions continue to be lower than originally expected due to the continued effects of the economic downturn. The projected foregone emissions benefits are discussed in more detail in Chapter IV of this report.

The amendments only change the mid-term timing of clean-up of the truck fleet and, therefore, do not result in any increase in emissions compared to existing environmental conditions. Also, despite the projected near-term delay in some emissions benefits compared to what was originally projected to be achieved by the regulation, emissions of diesel PM, NOx, and other criteria pollutants will continue to drop from today's levels as a result of the regulation with the proposed amendments and it will ultimately result in the same projected air quality benefits.

The definition of "NOx exempt areas" would be expanded to include designated regions that are either in attainment or near attainment of federal standards but are expected to attain the standards in the next few years. Additionally, the PM filter requirements for vehicles operated exclusively in the existing and proposed "NOx Exempt areas" would be phased in over a longer period from 2015 to 2020. Although emissions would not decline as rapidly, in these regions, trucks that travel in these areas would continue to meet the full requirements of the regulation and both NOx and PM emissions will

continue to decline. Since there is no longer a need to substantially decrease NOx emissions in these attainment areas, no adverse impacts to air quality would occur with the adjustments to the “NOx exempt areas” vehicle provisions as proposed.

The amendments also potentially reduce compliance costs for fleet owners because they will be able to defer the purchase of a PM filter, would have more time to raise the capital needed, and could instead upgrade directly to an used compliant 2010 model year engine, which would also result in NOx reductions earlier than currently required.

Based on the foregoing analysis, staff concludes the proposed amendments do not result in any significant adverse impacts to air quality and the regulation as amended would result in substantial air quality benefits.

Please refer to Chapter IV of this Staff Report for a more detailed discussion of the air quality benefits provided by the Truck and Bus regulation.

2. Other Resource Areas with No Impacts

Staff concludes that the proposed amendments would not result in any significant adverse impacts to any other resource area. The Staff Reports prepared for the original regulation and subsequent 2010 amendments did not identify any adverse environmental impacts to any resource areas and the methods of compliance remain the same with the proposed amendments, other than the compliance flexibility provisions which would affect only the projected air quality benefits discussed above. The proposed amendments do not impose any new requirements to retrofit or replace existing equipment beyond what is already required by the current regulation, or any other new actions that affect the physical environment. The proposed amendments do not cause any changes to the existing truck and bus infrastructure in California or new development, modification to buildings, or new land use designations and do not involve any activity that would involve or affect aesthetics, agriculture resources, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, or utility and service systems. Because the amendments do not result in any action that could affect these resources, staff concludes the proposal would not result in any adverse impacts.

Since no significant adverse environmental impacts were identified, this environmental analysis does not include a discussion of mitigation measures or environmental alternatives (17 CCR 60006; 14 CCR 15252).

VI. ENVIRONMENTAL JUSTICE

The objectives of ARB's statewide regulatory programs are better air quality and reduced health risk for all residents throughout California. The Board has a policy that community health and environmental justice concerns be addressed in all of ARB's regulatory programs.

The proposed amendments to the regulation is consistent with the goals of the current regulation to reduce PM and NOx, as well as reduce the associated cancer risks and other health impacts over time statewide. This is consistent with the ARB's environmental justice policy of reducing exposure to air pollutants and reducing the adverse impacts from toxic air contaminants in all communities, including low-income and minority communities.

VII. ECONOMIC IMPACTS ANALYSIS AND ASSESSMENT

This chapter discusses the effect of the proposed amendments on individual fleet owners and businesses affected by the regulation.

A. Summary of Cost Impacts of Proposal

The proposed amendments would reduce compliance costs for many fleet owners. The proposed amendments would lengthen compliance requirements for some fleet owners and therefore distribute the costs incurred by these fleet owners over a longer period of time. This would allow fleet owners more time to make the required upgrades, thereby providing time for used compliant truck prices to naturally decline. Fleet owners that comply by replacing with used trucks in lieu of retrofitting with a diesel PM filter will therefore benefit from lower cost complaint used trucks. The reduction in costs for fleet owners varies based on the fleet size and fleet makeup. A detailed discussion is provided below in Section B.

B. Economic Impacts Assessment

1. Truck and Bus Regulation Cost Methodology

Staff estimated the cost savings associated with the proposed amendments by using the vehicle model year distribution and retrofits estimates from the EMFAC2011 emission inventory, applied on a statewide basis. Costs between the current regulation and the proposed amendments are a function of:

- Timing of expected costs for fleet owners to acquire 2010 and later model year trucks
- Retrofit PM filter costs
- Annual maintenance costs
- The number of retrofit PM filters expected versus OEM PM filters in heavier trucks
- The rate of introduction of PM filters in lighter trucks

The estimated cost savings were determined by comparing the costs of the existing regulation for upgrading to newer trucks and for retrofitting existing trucks to those of the amended regulation for each year from 2015 to 2025, including annual maintenance and reporting costs. The estimated cost of the amended regulation is over $400 million lower than the existing regulation.

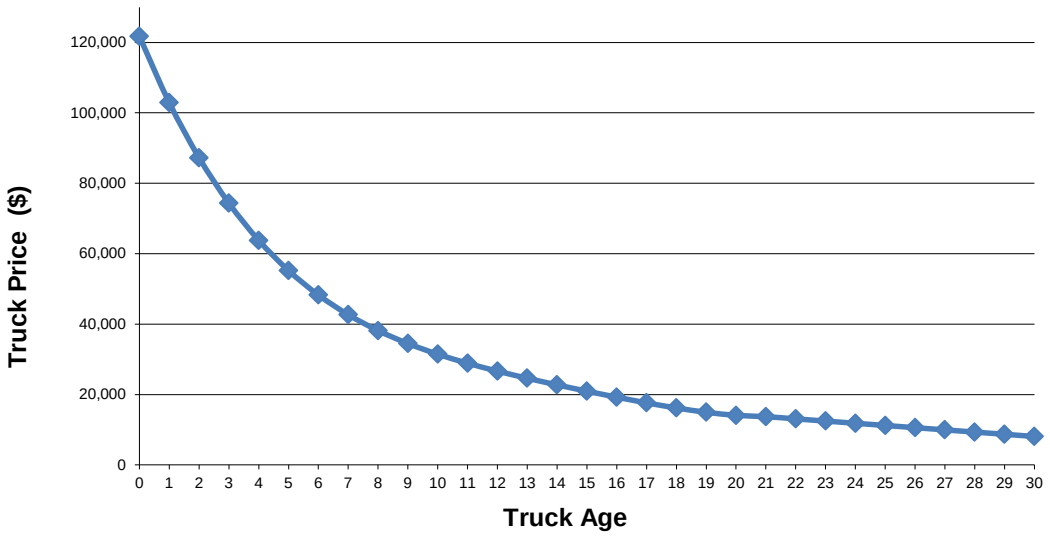
a) Heavier Vehicle Price and Replacement Costs

For truck replacements, staff used an empirical price curve for conventional tractor (without sleeper accommodations) for estimating the cost of replacing an older truck with a newer one. Figure VII-1 lists the example cost for a conventional truck base on for-sale truck price data from Truckpaper.com. As a simplification, staff did not separately account for the additional costs for trucks that have an attached body nor for

costs associated with purchasing a cab and chassis where the existing truck body could be moved to a replacement truck. This approach is somewhat conservative because these costs would be higher with the current regulation than with the amended regulation and would result in a greater cost reduction when compared to the proposed amendments.

Truck replacement costs were determined by comparing the expected number of trucks replaced each year. The costs for a truck replacement accounts for the total purchased price of a newer compliant vehicle and the residual value of the older vehicle and sales taxes at a rate of 8 percent. Annual costs for OEM filter maintenance and reporting costs are calculated separately.

Figure VII-1: Vehicle Price for Conventional Truck without Sleeper in California



Source: Truckpaper.com (2/4/2014)

b) Retrofit PM Filter Costs

For retrofit PM filter costs, staff used an average installed retrofit cost of about $18,000. This represents a typical installed cost of a passive retrofit PM filters, including tax. While active retrofit PM filters cost more, fewer than five percent of the retrofit PM filters that have been reported in TRUCRS, as of February 2014, are active retrofit PM filters; so staff did not use these filter costs as part of their assessment. This is conservative in that higher PM filter costs would increase the existing regulation costs more than with the proposed amendments; therefore, the cost savings associated with the proposed amendments would be slightly higher. The cost for retrofit PM filters is simply the differential (between the current and amended regulation) in the number of expected retrofit PM filters each year (primarily between 2015 and 2018) multiplied by the cost of the installed PM filter. The annual maintenance reporting costs are calculated below separately.

c) Expected Changes in Costs for PM Filter Upgrades for Heavier Trucks

The proposed amendments will change the expected timing and overall number of OEM and retrofit PM filters that will be installed to comply with the regulation. As shown in Figure VII-2, for in-state registered vehicles, both the existing regulation and amended regulation would increase the number of 2007 model year or newer trucks that have an OEM PM filter each year until 2023. By 2023, nearly all vehicles would have 2010 model year engines. However, because some of the PM filter requirements in the amended regulation are delayed, this is expected to result in fewer truck replacements prior to 2020. In 2020, the number of trucks expected to be replaced would be higher than the existing regulation because several extensions and exemption would expire and these trucks would need to be replaced. Out-of-state fleets that have trucks that operate locally, like fuel delivery, tow trucks, or vocational trucks, typically register their trucks in California, and would experience the same changes as California fleets. The changes in cost for these out-of-state owners are not separated and are included in the in-state registered truck estimates.

The proposed amendments treat all vehicles in the same market or vocation equally. Long-haul trucking fleets that are based in California or outside California do not compete in the same markets as vocational trucks and are affected differently because of their business model and type of truck used. Out-of-state fleets that are registered through the International Registration Plan and are based in other states are predominantly long-haul fleets that haul freight long distances. The impact of the changes on long-haul in-state and out-of-state fleets is discussed in the next section.

Figure VII-2: Estimated In-State Registered Heavier Vehicles Operating with OEM PM Filters

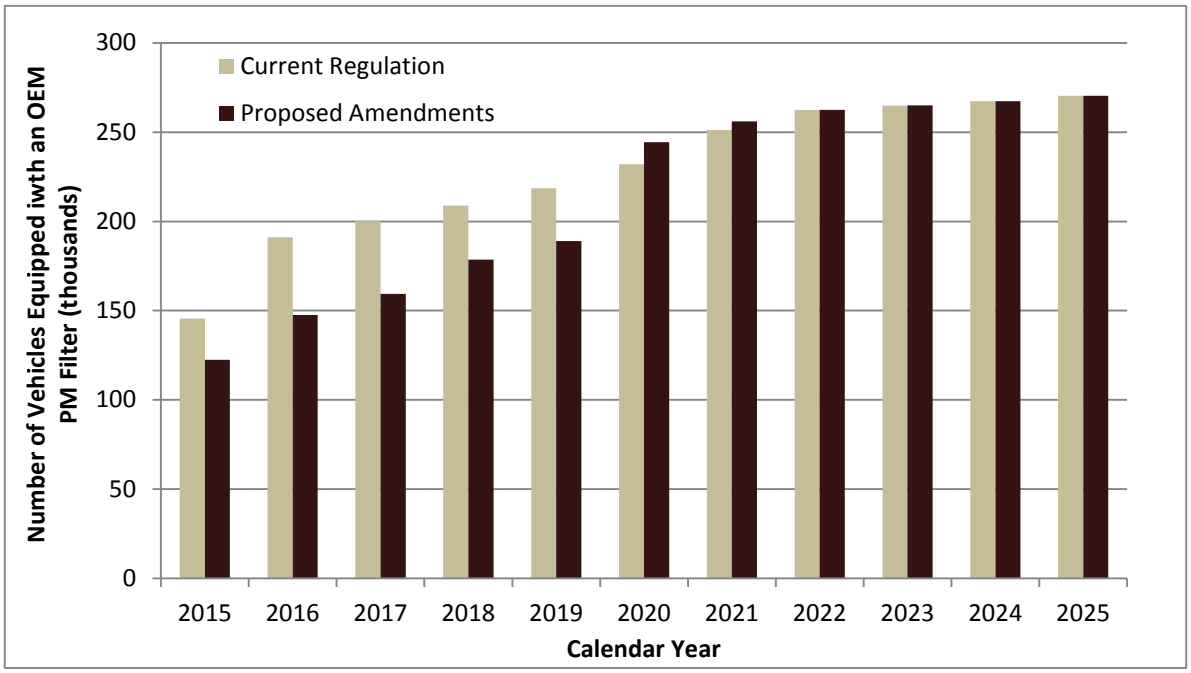
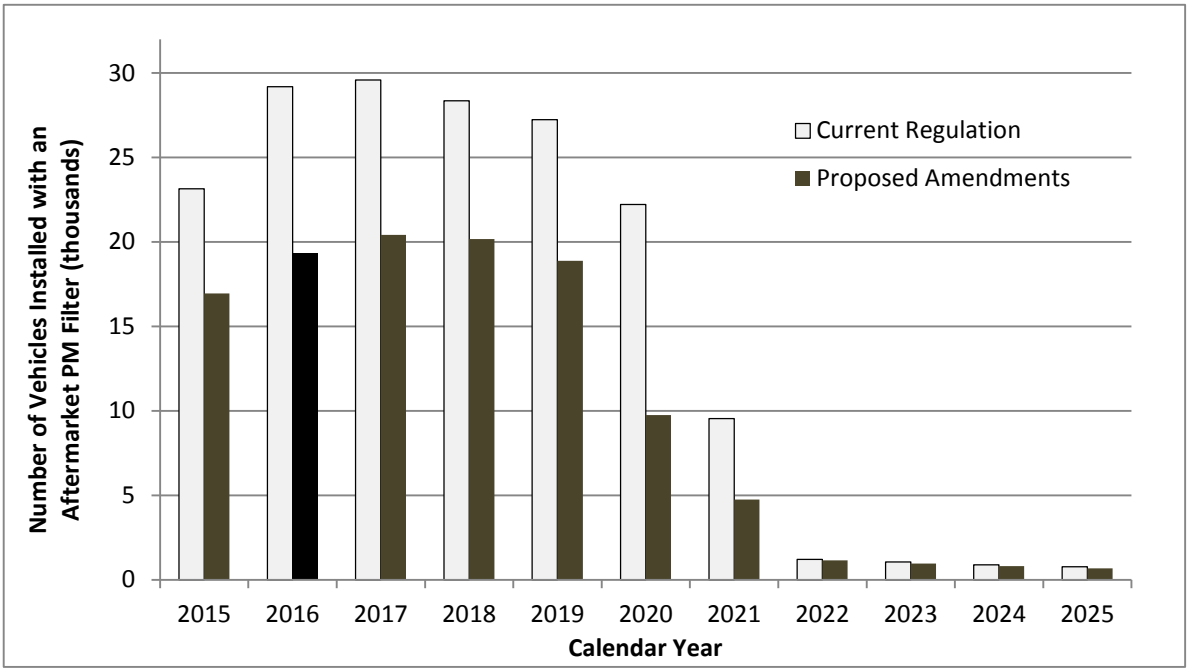


Figure VII-3 shows how the expected number of retrofit PM filters would change with the existing regulation compared to the amended regulations. While under the amended regulation the total number of retrofit PM filters in operation is expected to increase from 2015 to 2017, overall fewer total retrofits would be expected to be installed compared to the current regulation. After 2017, the number of PM filters decline as trucks get replaced to meet the 2010 model year engine requirements by 2023.

Figure VII-3: Estimated In-State Registered Heavy Vehicles Operating with Retrofit PM Filters



The difference in the expected number of retrofit PM filters and trucks with OEM PM filters each year was used to determine the capital and annual costs. The difference when comparing the existing regulation to the amended regulation for heavier trucks is shown in Table VII-1.

Table VII-1: Comparison of the Total Number of In-State Registered Heavier Trucks Operating with OEM and Retrofit PM Filters

Year	PM Filter Retrofits in Operation			OEM Filters in Operation		
	Current Regulation	Proposed Amendments	Retrofit Differential	Current Regulation	Proposed Amendments	OEM Filter Differential
2015	23,154	16,958	-6,196	145,669	122,561	-23,107
2016	29,186	19,320	-9,866	191,129	147,649	-43,480
2017	29,583	20,422	-9,162	200,027	159,341	-40,687
2018	28,350	20,173	-8,177	208,938	178,606	-30,331
2019	27,234	18,891	-8,343	218,588	189,008	-29,581
2020	22,219	9,749	-12,471	231,970	244,441	12,471
2021	9,547	4,751	-4,796	251,256	256,052	4,796
2022	1,217	1,151	-67	262,497	262,563	67
2023	1,053	966	-87	264,612	264,655	43
2024	899	809	-90	267,329	267,400	71
2025	772	684	-88	270,301	270,389	88

d) Changes in Costs for Long-Haul In-State and Out-of-State Fleets

High mileage fleets that travel more than 100,000 miles per year commonly replace their trucks within a 3 to 10 year replacement cycle as part of their normal business practice. Also, high mileage fleets based outside of California have the ability to comply by dispatching newer compliant trucks to California. As a result, most of these trucks will have been upgraded through normal business practices ahead of compliance obligations. For these fleets, regulatory costs and potential savings generated by proposed amendments will both be low.

Some higher mileage large fleets will need to take actions to comply. The proposed rule amendments benefit these fleets by deferring compliance obligations for small fleets, fleet owners that have acted early or have downsized, and owners that cannot afford to comply. For these limited fleets, regulatory costs and potential savings will both be more substantial.

All of the proposed changes apply equally to in-state and out-of-state long-haul fleets, and these fleets benefit equally when they compete in the same markets. The proposed expansion of the low-use exemption for trucks that travel less than 5,000 miles per year until 2020 is unlikely to be used by long-haul fleets because the mileage threshold is less than 1/20th of the typical miles travelled by these trucks in a year. It is possible that regional operators that travel in California, like less than truckload carriers, may use the exemption for back-up vehicles.

Some fleets compete in vocational markets such as construction and generally maintain captive fleets in the markets they serve. Most of these fleets register their trucks in California and would benefit from the proposed amendments as discussed in the prior

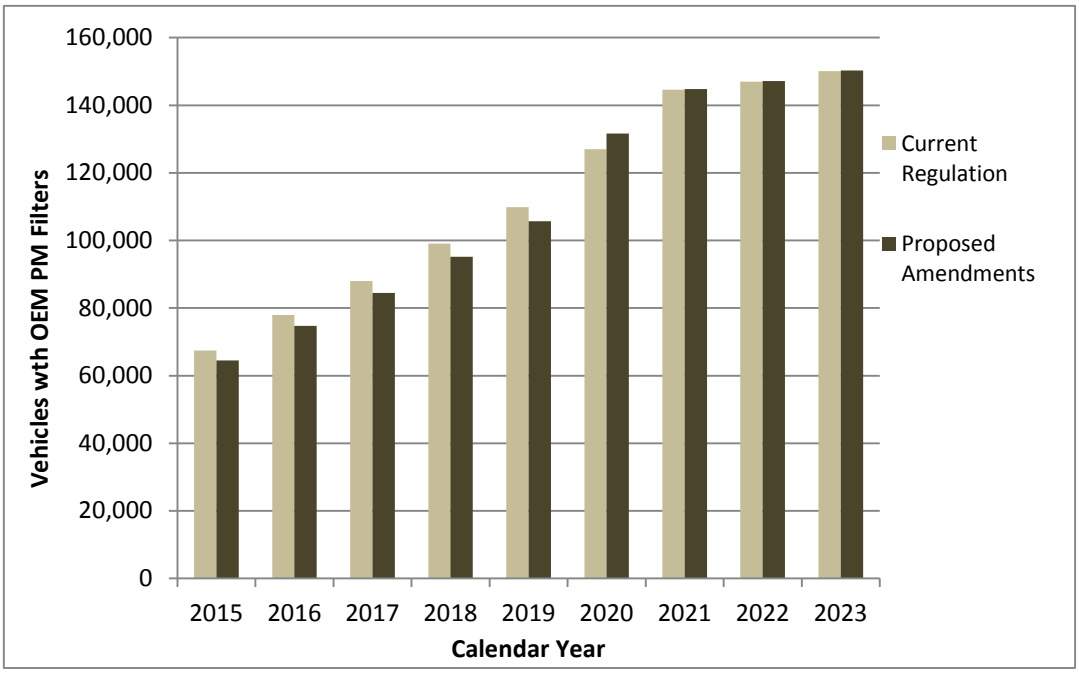
section. However, to the extent some vocational fleets register their trucks outside of California, the cost savings would be similar.

e) Changes in Costs for PM Filter Upgrades for Lighter Vehicles

Until 2020, the existing regulation does not require lighter vehicles to be upgraded if they are less than 20 years old, and retrofit PM filters are not required. The proposed amendments include new options to phase-in compliance for a relatively small number of homogenous fleet owners that have a high number of older engines, and staff expects that many older lighter trucks will use the proposed 5,000 mile low-use exemption and defer replacements until 2020.

Figure VII-4 shows the estimated expected number of lighter vehicles that would be equipped with an OEM PM filter under the existing regulation compared to the amended regulation.

Figure VII-4: Expected Upgrades for Lighter Vehicles



The difference in the expected number of lighter vehicles with OEM PM filters each year was used to determine the capital and annual costs. The difference when comparing the existing regulation to the amended regulation for lighter vehicles is shown in Table VII-2.

Table VII-2: Comparison of the Total Number of In-State Lighter Trucks Operating with OEM and Retrofit PM Filters

Year	Current Regulation	Proposed Amendments	OEM Filter Differential
2015	67,470	64,538	-2,932
2016	77,897	74,719	-3,178
2017	87,966	84,509	-3,457
2018	99,078	95,189	-3,889
2019	109,892	105,653	-4,239
2020	126,982	131,608	4,625
2021	144,587	144,770	183
2022	147,007	147,180	173
2023	150,081	150,238	157

f) Annual Operational and Maintenance Costs

Operational and maintenance costs associated with OEM and retrofit PM filters include annual filter cleaning expenses, fuel economy losses and costs associated with regeneration of active systems. The methodology and assumptions staff used for calculating the annual costs are the same as those described in Appendix J of October 2008 Technical Support Document for In-Use On-Road Diesel Vehicles (ARB, 2008).

The net annual PM Filter maintenance cost reduction, between 2015 and 2025, for in-state fleets resulting from the proposed amendments was estimated to be approximately $27 million.

g) Annual Reporting Costs

In general, reporting costs for affected fleet owners are expected to increase some because some of the added flexibilities in the proposed amendments would extend reporting periods and may newly include more fleet owners. Staff estimates that up to one third of the vehicle population would qualify for some type of mileage extension. The increase in mileage reporting activity would start in 2015 and taper off at 2020. Staff used the same methodology as used in 2010 Staff Report to estimate reporting costs. There would be no reporting cost change for fleet owners electing to use Model Year Schedule, as Model Year Schedule option has no reporting requirement. The total increase in ongoing reporting cost would be approximately $240,000 in 2014 dollars.

h) Total Cost Reduction for the Regulation with Proposed Amendment

The total costs attributable to the amendments for lighter and heavier trucks combined are associated with the savings from:

- Deferring retrofit or replacement costs to later years, with an assumed capital recover rate of 7 percent
- Lower annual ongoing costs

- Lower costs associated with upgrades to lower priced used trucks.

The total estimated cost savings attributed to the amendments are shown in Table VII-3. Total costs are more than $400 million lower in 2014 dollars than the existing regulation.

Table VII-3: **Annual Difference in Costs of the Amended Regulation Compared to the Existing Regulation ($2014 millions)**

Year	Change in Capital Costs	Change in Ongoing Cost	Change in Compliance Costs
2015	-$43	-$6	-$49
2016	-$105	-$11	-$116
2017	-$103	-$4	-$107
2018	-$70	-$1	-$71
2019	-$54	-$4	-$58
2020	-$9	$4	-$5
2021	-$2	-$4	-$5
2022	-$19	-$1	-$20
2023	-$4	$0	-$4
2024	$13	$0	$13
2025	$4	$0	$4
Total	-$393	-$27	-$420

C. Impact on Small Business

Compared to the current regulation, the proposed amendments would not impose any additional costs on small businesses, and should result in small businesses, many of them small fleets, being able to spread out the compliances costs over a longer period of time, thus, lowering their average yearly compliance costs. However, the amends could have a negative economic impact on retrofit manufacturers and installers and firms that provide repowers in the short term because orders would be spread out over the next several years, and affected fleets may opt to replace their vehicle with a newer compliant vehicle in the future rather than installing a retrofit or performing an engine replacement.

D. Significant Adverse Economic Impact

The proposed changes to the regulation will not have a significant adverse economic impact, as they provide for additional compliance time and flexibility, which will reduce compliance costs for many fleet owners, while recognizing fleet owners that are already compliant.

E. Major Regulations

The Regulation will exceed $50 million in economic costs through capital cost savings in the years 2016 through 2019 compared to the existing regulation; therefore, it is

considered to be a major regulation. The expected impact of the proposed amendments would be to reduce the overall cost of the regulation by over $400 million over its lifetime or about 20 percent lower than the existing regulation. None of the changes would make the regulation more stringent; therefore, it would not increase costs to any individual business. Additional detail on the annual expenditures and compliance costs are in Appendix J.

F. Impacts on Incentive Funding

State and local incentive funding programs play a complementary role to the state's regulatory emission reduction programs to help meet the state's SIP requirements and achieve California's air quality goals. California's portfolio of incentive funding programs includes the Carl Moyer Program (including the Truck Improvement/Modernization Benefitting Emission Reductions Program), on-road Voucher Incentive Program (including the California Hybrid Truck and Bus Voucher Incentive Project), the Goods Movement Emission Reduction Program, Lower Emission School Bus Program, and the AB118 Air Quality Improvement Program. ARB also provides a loan assistance program to offer financial opportunities to on-road heavy-duty vehicle owners. In addition, federal air quality financing programs are available to state and local governments.

1. Impact of Proposed Amendments on Funding Opportunities

Funding is provided to replace or retrofit older, high-polluting heavy-duty vehicles to achieve early or extra (surplus) emission reductions in excess of the requirements of the regulation. Eligibility depends on several factors, including fleet size, vocation, miles traveled, regulatory compliance dates, location of activity, and the percent of miles traveled in California. In addition, each funding program must be consistent with statutory requirements that vary by program. In general, the regulation compliance deadlines affect eligibility by establishing the end of the surplus emission reduction period (i.e., in most cases this means that the emission reductions must be realized several years ahead of any regulatory deadlines).

The rule was designed to provide maximum incentive funding opportunities to fleet owners. However, the ability of most fleet owners to access existing incentive programs is now severely limited or non-existent because of upcoming compliance dates. Because the proposed amendments provide additional time for many fleet owners, some truck projects may once again be eligible for incentive funding as they potentially would meet the surplus emission reduction requirements of the incentive programs. The proposed regulatory changes should enable some additional funding opportunities for fleet owners, and in particular smaller fleet owners, by allowing more time for applicants to apply for funding before the amended compliance dates. Staff will continue to work with local air districts to identify opportunities to assist fleet owners in deploying cleaner trucks while continuing to achieve surplus emission reductions.

2. Access to Funding for Vehicle Owners

Interested vehicle owners can obtain more information on many existing incentive programs by using any of ARB's outreach tools, including:

- The Truck Stop website at www.arb.ca.gov/truckstop.
- The diesel hotline at 866-6DIESEL (866-634-3735).
- Via email at 8666diesel@arb.ca.gov.

In addition, many local agencies have their own funding programs, as well as administer federal and state programs, so vehicle owners are encouraged to check with their local air quality management district for additional funding opportunities.

G. Reasonable Alternatives to the Regulation and the Reason for Rejecting those Alternatives

No alternative considered by ARB would be more effective in carrying out the purpose for which the amended regulation is proposed or would be as effective as or less burdensome to affected private persons than the proposed amended regulation. A discussion of the alternatives considered, and why they were rejected in favor of the proposed amendments, is described in Appendix G.

The proposed amendments were chosen as the best structure to protect the emission reductions expected by the regulation by providing the maximum flexibility for fleet owners to determine their own, most cost-effective combination of PM filters, engine repowers, retirements, and accelerated vehicle replacements to comply with requirements of the proposed regulation. They also allow fleet owners to make decisions concerning which vehicles they plan to keep for a long time versus those that are better candidates for replacement. It also recognizes fleet owners that complied early or use advance technology vehicles or alternative fueled vehicles.

1. Alternatives Considered

Throughout the regulatory amendment development process, staff worked with stakeholders and evaluated a number of suggested alternatives to the proposed amendments. The alternatives considered are provided below:

- Make no changes to regulation.
- Increase "low-use vehicle" threshold to 5,000 miles per year based on miles travelled in California and not on total miles.
- Delay compliance for construction trucks up to 65,000 miles per year.
- Replace PM filter requirements with opacity testing in attainment areas.
- Exempt heavier vehicles having 2007 – 2009 model year engines purchased before January 1, 2014 from upgrading to 2010 engine model year equivalent engines until 2027.
- Delay the replacement of 2007 to 2009 model year engines beyond 2023 with the purchase of engines that are certified below the current 2010 NOx emissions standard.
- Remove PM filter requirements for small fleets.

- Allow limited miles outside of NOx exempt areas.

H. Justification for Adoption of Regulations Different from Federal Regulations Contained in the Code of Federal Regulations

U.S. EPA does not have authority to adopt in-use emission standards relating to the control of in-use motor vehicles, and thus there are no federal regulations comparable to the regulation to reduce emissions from in-use on-road diesel vehicles that operate in California. Under the federal Clean Air Act, U.S. EPA has established NAAQS for pollutants considered harmful to public health, including PM2.5. Areas in the State that exceed the NAAQS are required by federal law to develop SIPs describing how they would attain the standards by certain deadlines. In September 2007, ARB adopted a SIP committing the State to develop measures to achieve emission reductions from sources under State regulatory authority, including in-use vehicles covered by the regulation.

U.S. EPA approved the Truck and Bus regulation, as amended in 2010, into the SIP in April 2012.

VIII. SUMMARY AND RATIONALE FOR EACH REGULATORY PROVISION

A. Summary and Rationale for Each Regulatory Provision

1. Summary of Proposed Regulation Amendment

The proposed amendments to the Regulation achieve staff objectives. As described below, the proposed amendments would provide the following:

- A longer-phase-in period for PM requirements for trucks operated exclusively in certain rural areas that have made substantial progress towards cleaner air while continuing to ensure compliance with diesel risk reduction program goals.
- Additional time and a lower cost pathway for small fleet owners to achieve compliance with PM requirements, while re-opening opportunities for these fleet owners to apply for and receive public incentive funding.
- A compliance pathway for owners currently unable to qualify for a loan to finance compliance.
- Adjusted schedules for low-use and certain vocational and work trucks that travel fewer annual miles and are not competitive in obtaining incentive funding.
- Recognition of fleet owners that took early action to comply by providing additional useable life for retrofit trucks and reducing near-term compliance obligations.

2. Longer PM Filter Phase-in for Rural Areas that Meet Air Quality Standards

The existing regulation allows owners of heavier trucks that, while operating in California, are operated exclusively in NOx Exempt Areas to phase-in PM filters from 2014 to 2016. In addition, lighter and heavier vehicles that operate in the NOx Exempt Areas, unlike in nonattainment areas, do not need to upgrade to 2010 model year engines if the vehicles are equipped with a retrofit or OEM PM filter. Vehicle owners must report information about their vehicles and must label them to use the extension.

First, staff is proposing to change the NOx Exempt Areas provisions by expanding the number of regions that are included in the option. Figure VIII-1 shows the existing NOx Exempt areas in the darker shaded areas and the proposed additional areas are shown in the lighter shading. Detailed maps of partial counties that are included in the NOx Exempt areas are in Appendix D.

Figure VIII-1: Existing and Proposed NOx Exempt Areas

Existing NOx exempt areas include the following counties: Alpine, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Monterey, Northern Sonoma (as defined in title 17, CCR section 60100(e)), Plumas, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz, Shasta, Sierra, Siskiyou, Trinity, Tehama, and Yuba.

Proposed additional areas would include: Amador, Butte, Calaveras, Inyo, Eastern Kern (that portion of Kern County within the Eastern Kern Air Pollution Control District), Mariposa, Mono, Nevada, Northern Sutter, Tuolumne and the Placer and El Dorado County portion of the Tahoe Air Basin.

The proposed additional NOx Exempt areas includes both regions that are in attainment of federal air quality standards, and regions that are near attainment of federal air quality standards and are expected to attain the standards in the next few years. Several areas of the state that contribute to the non-attainment status of other areas were not included in the proposed amendment.

Staff also considered whether to include Yolo, Solano, El Dorado, Placer, and portions of San Bernardino County in the NOx exempt area definition. These regions are classified as non-attainment for ozone and contain significant cities located in close proximity to interstate roadways including Vacaville, West Sacramento, Roseville, Placerville, Victorville, Barstow, and Hesperia.

The proposed amendments would also spread out PM filter requirements over a longer period of time by postponing their initial compliance date by one year and deferring their final compliance deadline by four years, per the proposed schedule shown in Table VIII-1. Additionally, staff is proposing to allow fleet owners having lighter trucks to use this schedule instead of the current engine model year schedule for their lighter trucks. Finally, language would be added clarifying that vehicles using the NOx Exempt Area provisions may travel outside of the designated areas to support emergency operations.

Table VIII-1: Compliance Schedule for NOx Exempt Area Fleets

Compliance Deadline as of January 1	Current PM Filter Phase-in	Proposed PM Filter Phase-in
2014	33%	0%
2015	66%	25%
2016	100%	40%
2017		55%
2018		70%
2019		85%
2020		100%

Small fleet owners with 3 or fewer vehicles that operate exclusively in NOx Exempt Areas, regardless of vehicle weight class, would have the option to comply with the schedule in Table VIII-2.

Table VIII-2: Compliance Option for Small Fleets in NOx Exempt Areas

Number of Trucks	Existing Regulation PM Filter Required January 1	Proposed Regulation PM Filter Required January 1
One Truck	2015	2017
Two Trucks	2014, 2016	2015, 2019
Three Trucks	2014, 2015, 2016	2015, 2017, 2019

Staff expects that even though the proposed amendments will defer PM and NOx emission reductions in some areas of the State, these regions will benefit over time as fleet owners upgrade their vehicles to meet PM filter requirements from trucks operating in the region. This is especially true for PM emission reductions, as all trucks operating in these regions would be required to have PM filters installed by 2020, consistent with the Diesel Risk Reduction Plan. Additionally, since NOx reductions in these regions from the regulation are not needed to attain or maintain federal air quality standards, no adverse impacts to air quality are expected.

3. Additional Time and a Lower Cost Pathway for Small Fleets that Operate Outside NOx Exempt Areas

For trucks that operate outside designated NOx Exempt Areas, the existing Small Fleet Option delays compliance for all owners with one to three trucks for two years compared to larger fleet owners. A single truck owner was required to retrofit the truck by January 1, 2014. For small fleet owners with two or three trucks, this option requires them to have a PM filter on their first truck by January 1, 2014, on their second truck by January 1, 2015 and (if applicable) on their third truck by January 1, 2016. Staff is proposing to extend the compliance schedule for all small fleet owners to allow them to upgrade the second and third truck in the fleet every other year. [1] Table VIII-3 lists the current and proposed compliance schedule.

Table VIII-3: Optional Schedule for Small Fleet PM Compliance

Small Fleet Option	Existing Schedule	Proposed Schedule
First Truck	January 1, 2014	January 1, 2014
Second Truck	January 1, 2015	January 1, 2016
Third Truck	January 1, 2016	January 1, 2018

This proposed amendment would provide additional time for small fleet owners to meet the PM requirements of the regulation, which is expected to improve the ability for small fleet owners to comply. While this deferral would result in delayed PM emissions reductions compared to the existing regulation, these trucks would still be equipped with PM filters by 2018, ahead of the goals of the Diesel Risk Reduction Plan. The deferral

[1] An out-of-state small fleet owner would only be required to bring those trucks that actually operate in California into compliance and not all trucks in the fleet.

provides additional opportunities for such owners to upgrade to a truck with a 2010 or newer model year engine because the owner would have more time to raise capital and to take advantage of declining used truck prices, as well as improve opportunities for two or three truck owners to take advantage of public funding programs. The deferral also creates the potential for additional NOx reductions between 2018 and 2023 if the owner upgrades to a vehicle meeting 2010 or later model year engine standards earlier than would be expected under the current regulation, rather than installing a retrofit PM filter.

While staff is not proposing to change the January 1, 2014 compliance date for the first truck in a small fleet, those fleet owners that did not meet that deadline due to financial challenges will be able to obtain relief through the proposed amendment discussed in Section 4.

4. Option for Owners Having Financial Compliance Challenges

Staff is proposing a new flexibility option that would defer compliance with the PM filter requirements for all owners that have experienced or are experiencing financial challenges in complying with the regulation. Staff‘s proposal would allow such owners to defer compliance with the PM filter requirements by committing to upgrade directly to a vehicle with a 2010 model year or newer engine by January 1, 2018. To best protect expected emission benefits, staff is proposing to limit this option to no more than three trucks in the fleet and to establish criteria to minimize competitive disadvantages for owners that have already complied.

The following are the proposed criteria for the owner to use the option:

- The vehicle to be replaced was owned by the participating owner prior to January 1, 2012.
- Between July 1, 2013 and December 31, 2014, the fleet owner was denied a loan to retrofit the vehicle with a PM filter, or to replace the vehicle with one that has a 2007 model year or later engine that is similar to the one being replaced.
- The owner must report to ARB by January 31, 2015, to claim the option.

The proposed amendment is intended to provide an option for all fleet owners that are unable to comply for financial reasons. Based on data reported into TRUCRS, as of January 31, 2014, about 3,000 small fleet owners and 1,000 large fleet owners reported that they were denied a loan needed to bring the fleet into compliance, and would likely not be able to meet the requirements of the regulation. Considering this, the proposed amendment better protects the expected emission reductions by providing a compliance pathway for fleets that are unable to fully comply with regulatory requirements; and in doing so potentially makes trucks in those fleets newly eligible for incentive funding. Finally, the additional time provided for compliance in 2018 would increase the likelihood that the owner will be able to afford a used truck with a 2010 later model year engine as used truck prices decline with each passing year from time of original manufacture; this creates the potential for additional NOx reductions between 2018 and

2023 as such fleet owners upgrade vehicles to a 2010 or later model year engine earlier than is required under the current regulation.

5. Maximum Replacement Requirement

Staff is proposing to add a new compliance option for lighter and heavier trucks that would set an upper limit on the number of vehicles within a fleet that would need to be upgraded with a 2010 model year engine in any given year starting January 1, 2015. The limit would be the greater or 25 percent of the vehicles in the fleet or 2 vehicles. The change would provide additional compliance flexibility for fleet owners that have a high percentage of older trucks that would need to be upgraded beginning in 2015, thereby better ensuring that fleet owners are able to fully meet all of their compliance requirements.

6. Adjusted schedules for low-use and vocational trucks

a) Work Truck Phase-in Option

Staff is proposing to replace the existing construction truck extension with a new work truck phase-in option. Currently, the low mileage construction truck definition applies only to heavier trucks and includes any truck owned by a licensed contractor, and a limited number of vehicle types regardless of who owns them. The latter group includes:

- Dump trucks (including tractor trailer combinations)
- Cranes with a 35 ton capacity
- Water trucks
- Concrete pump trucks
- Concrete mixers
- Lowboy tractor trailer combinations

Under the existing extensions, dump trucks can operate up to 20,000 miles per year and all other trucks are limited to 15,000 miles per year to be eligible.

Staff is proposing to delete the existing Construction Truck definition and add a new definition for Work Trucks. The definition would include all trucks except for tractor-trailer combinations that are not already included in the existing Low-Mileage Construction Truck definition. The new definition would also exclude truck and trailer combinations that are used to haul goods because these combination vehicles compete directly with similar tractor trailer combinations that have one or two trailers. Examples of excluded truck and trailer combinations are fuel tankers, flatbeds, and auto carriers. Buses would also not be included. The scope of vehicles covered by the proposed extension is closely tailored to minimize different fleets from being competitively disadvantaged.

Staff is proposing to set the annual mileage limit at 20,000 miles per year to have a single mileage threshold for all low-mileage work trucks. The proposed PM filter

compliance schedule is shown in Table VIII-4 below. By setting the mileage limit at 20,000 miles per year, this change would potentially defer compliance for 60 percent or more of heavy work trucks that represent about 35 percent of the emissions from all work trucks. The compliance requirements for higher mileage work trucks would not change.

Table VIII-4: Proposed Schedule for Low-Mileage Work Trucks

Compliance Date	Existing Low-Mileage Construction Truck PM Filter Schedule	Proposed Low-Mileage Work Truck PM Filter Schedule
January 1, 2014	33%	33%
January 1, 2015	66%	40%
January 1, 2016	100%	60%
January 1, 2017		80%
January 1, 2018		100%
January 1, 2020	Subject to engine model year schedule	Subject to applicable engine model year schedule

Currently, about 6,000 trucks are using the low-mileage construction truck extension, with 33 percent of the vehicles in these fleets having PM filters by January 1, 2014. The proposed schedule would extend the existing compliance schedule by an additional two years. Staff estimates that the proposed work truck definition would allow an estimated 20,000 to 30,000 other work trucks that did not qualify for the existing low-mileage construction truck extension to use this option for the first time.

Owners that are 1) utilizing the current phase-in option for heavier trucks, 2) are in compliance with the January 1, 2014 requirement (by upgrading 90 percent of their fleet to vehicles with PM filters), and 3) meet the eligibility requirements for this option, would be able to defer further action on the remaining vehicles in their fleet until January 1, 2018 (two years longer than is currently permitted).

Staff is also proposing to allow owners to comply with this option separately for lighter trucks in the fleet. All lighter trucks that operate less than 20,000 miles per year would meet the work truck definition except for buses. This option would allow a fleet owner that has a high percentage of older vehicles to spread out their compliance obligations over several years, while also allowing a single truck owner of a lighter truck to defer compliance until January 1, 2016.

Compared to tractors, many work trucks with specialized attached bodies have additional compliance costs associated with their replacement, and are not as widely available on the used truck market. For an owner that must replace such a truck to comply with the regulation, in many cases the existing body on the truck will need to be

moved onto the replacement truck chassis. Such a need can add between $2,000 and $5,000 to the overall cost of compliance. For some highly specialized truck bodies, these costs can be even higher. By providing additional compliance time, affected fleets in specific vocations that demand application-specific configurations may be able to obtain a used truck chassis for less cost, thereby lowering their overall compliance costs.

b) Expanding the Low-Use Vehicle Exemption Until 2020

The current regulation currently exempts vehicles that travel less than 1,000 miles per year within California's border from meeting the emission reductions requirements of the regulation. For vehicles that perform work while stationary, like drill rigs, boom trucks, or cranes, they are also limited in operating the engine or PTO no more than 100 hours per year. This exemption does not expire or sunset.

As shown in Table VIII-5 staff is proposing to expand the existing definition by including, until 2020, vehicles that annually travel fewer than 5,000 total miles per compliance year, regardless of where the vehicle is operated. Staff is also proposing to remove the annual 100 hour PTO limit for these vehicles. This amendment would improve the ability for fleet owners to continue operating back up vehicles, and for construction fleet owners to keep specialized equipment that have very little annual use. The extra time for low use vehicles allows owners to extend the useful life of existing vehicles and shifts the priority of compliance to higher use vehicles in the fleet.

Table VIII-5: Current and Proposed Low Use Vehicle Thresholds

Current Requirement	Proposed Requirement
<1,000 miles and <100 hours on PTO in CA (No sunset)	<1,000 miles in CA (no sunset, no PTO limit)
	<5,000 miles total on truck (sunset in 2020, no PTO limit)

The 5,000 mile threshold represents less than 5 percent of the annual miles travelled by heavier trucks. As such, the amendment would not be expected to result in a significant impact on local PM exposure risk because the eligible vehicles are generally distributed throughout the state, and the low mileage limit would indicate that they would not be a significant contributor to emissions in high traffic areas, like distribution centers and along roadways, where exposure to toxic diesel PM emissions are greatest. However, despite these lower annual miles, staff does not believe that the contribution to exposure risk from diesel PM is nonexistent; in fact, as the rest of the statewide fleet experiences reduced diesel PM emissions, emissions from these low mileage vehicles will become a larger fraction of overall diesel PM inventory. Therefore, staff believes the proposed 2020 sunset of the 5,000 mile limit is appropriate.

c) Smoothing Requirements for Low Mileage Agricultural Vehicles

To be considered an agricultural vehicle, a vehicle must meet the restrictive definition of the regulation, which was closely tailored to minimize different fleets from being competitively disadvantaged.

Currently, the existing agricultural vehicle extension delays compliance with the regulation's emission-related requirements for eligible vehicles that operate less than 15,000, 20,000, or 25,000 miles per year, depending on engine model year. These mileage thresholds are set to expire on January 1, 2017. After that date, only agricultural vehicles that did not exceed 10,000 miles per year, since 2011, as well as designated specialty agricultural vehicles, have an extension until 2023. Staff is proposing to 1) lengthen the limited mileage extension by several years while stepping down the mileage limit over time, 2) simplify how the regulation is implemented, and 3) include cattle livestock trucks in the specialty truck definition.

Lengthen the Limited Mileage Extension

Staff is proposing to lower the annual mileage threshold to a single threshold of 15,000 miles per year starting January 1, 2017 and dropping to 10,000 miles per year starting January 1, 2020. The extension would still expire on January 1, 2023. This change would phase out the extension as it is lowered over time, yet provides owners more flexibility to manage their fleet and distribute compliance for owners over several years rather than requiring them to upgrade nearly all of their vehicles all at once prior to 2017. Staff estimates there are about 5,000 agricultural trucks statewide that are currently using the extension that may be able to continue using the extension past 2017 as proposed.

Specialty Agricultural Vehicle Definition

Staff is proposing to add cattle livestock trucks to the definition of the "Specialty Agricultural Vehicle". Specialty agricultural vehicles are exempt from the emission reduction requirements of the regulation and do not have a mileage limit. The regulation currently places a limit on the total number of vehicles that can qualify for the extension. Staff estimates there are about 500 in-state and out-of-state cattle livestock trucks that operate in California, and that most of the miles traveled are outside the San Joaquin Valley. In addition, staff is proposing to remove the limit on the number of vehicles that can qualify for the extension because it is no longer needed, as the total number of specialty agricultural vehicles in the State and in the San Joaquin Valley did not exceed the limits imposed by the current regulation and the regulation does not allow fleet owners to increase the number of specialty truck extensions in their fleet from year to year.

Log Truck Phase-in Option

Staff is proposing to extend the opt-in period for log trucks using the phase-in option to January 31, 2015. This change is being proposed to allow log- truck owners to opt-out

of the log truck option if other amended options are more advantageous for the fleet owner.

d) Providing Flexibility for Heavy Cranes

Staff is proposing a new compliance option to address compliance issues with heavy cranes[2] in a fleet. Currently, heavy cranes are treated the same as any other vehicle covered by the regulation. However, replacement costs for heavy cranes can run in the hundreds of thousands to millions of dollars. As shown in Table VIII-6, the proposed amendment would include an adjusted compliance schedule for all heavy cranes that operate in California, which would allow fleets to comply by upgrading the cranes in the fleet to a 2010 model year or later engine at a rate of 10 percent per year starting on January 1, 2018. Staff is also proposing to provide credit for heavy cranes that are retrofitted before January 1, 2018 by counting any crane that has a PM filter before January 1, 2018 towards the 2010 engine requirement. Such cranes would also be exempt from the replacement requirement.

Table VIII-6: Proposed Heavy Crane Phase-in Option

Compliance Deadline as of January 1	Required Crane Fleet Upgrades to 2010 Model Year Engines			
	1 Crane Owner	2 Crane Owner	3 Crane Owner	4 or More Cranes
2018				10%
2019			1	20%
2020		1		30%
2021				40%
2022	1		1	50%
2023				60%
2024				70%
2025		1		80%
2026			1	90%
2027				100%

Heavy cranes without PM filters would continue to be counted as part of the fleet of vehicles that do not have PM filters so that the clean-up of other trucks in the fleet would not change. The amendment would minimize the impact on heavy crane fleet owners that have made upgrades to comply, and would allow more flexibility in meeting compliance requirements, and allow these cranes to operate for a 20 year useful life.

[2] "Heavy cranes" are on-road single cranes that are 1) certified as power-operated equipment that can hoist, lower, and horizontally move a suspended load, 2) are required to be operated by a licensed crane operator, and 3) the GVWR is 54,000 pounds or more.

A key rational for this proposed amendment is that modifications to heavy cranes require review and approval by the manufacturer or a registered professional engineer who is familiar with the equipment, and may require modifications to load charts, procedures, instruction manuals and other items as needed. In addition, due to the complexity of the crane design, the number of PM filters available for each heavy crane is limited, and assessments by the crane manufacturer or the registered professional engineer that is familiar with cranes would have to evaluate modifications on a case by case basis; so the proposed heavy crane extension recognizes the time required to evaluate heavy crane modifications incurred by PM filter installations. Staff estimates there are 500 to 800 cranes that may use the proposed phase-in option.

7. Smoothing out Regulatory Compliance Requirement

Staff is proposing to set an upper limit of 25 percent on the number of vehicles that would need to be upgraded with a 2010 or later model year engine each year starting January 1, 2015. This change would provide additional compliance options for fleet owners that have a high percentage of older trucks that would need to be upgraded after 2015.

8. Recognizing Actions Already Taken to Comply

Staff is proposing changes to provide additional compliance time for many fleet owners, which may benefit fleet owners that have not complied on time and could make it more difficult for already compliant fleet owners to recover the costs of their investments. Because of this, staff is proposing several changes that will provide additional credits, or extend the use of existing credits, for fleet owners that meet the requirements of the regulation.

a) Extending the use of retrofit PM filters

Staff is proposing to recognize owners that installed retrofit PM filters on their vehicles before January 1, 2014 by extending the compliance period for the truck until January 1, 2023. In most cases, this would postpone the requirement to upgrade to a 2010 model year or later engine by up to three years so long as the vehicle remains in the owner's fleet. This proposed amendment would not result in any change in PM emissions and would still provide the same level of NOx reductions by 2023. Staff estimates that this option would extend the useful life of about 12,000 trucks.

b) Extending early compliance credits

The existing regulation has a number of credits intended to encourage vehicle owners to make early upgrades by retrofitting heavier vehicles, adding vehicles with OEM PM filters earlier than required, or by upgrading to advanced technology or alternative fueled vehicles. These credits can be used by any fleet that complies with the PM filter phase-in option of the regulation, and can defer compliance by several years for other heavier trucks in the fleet. The regulation also contains provisions to provide credits to fleets that downsized as a result of the recession. These credits are set to expire in 2016 or 2017, and staff is proposing to extend them until 2018 or 2020, depending on

the credit. Table VIII-7 identifies the credit provision, its current expiration date, and the proposed expiration date. The table also lists the total number of trucks that have been reported to claim these credits.

Table VIII-7: Proposed Extension of Compliance Credits

Action to earn credits	Current Expiration Date	Proposed Expiration Date	Total Trucks Utilizing Credits (as of Jan 31, 2014)
Early PM filter credits	1/1/2016	1/1/2018	1,800
Early addition of vehicles with OEM PM filters	1/1/2017	1/1/2018	2,300
Adding alternative fueled vehicles	1/1/2017	1/1/2018	2,200
Downsizing compared to 2006	1/1/2017	1/1/2018	14,400
Adding advanced technology vehicles	1/1/2017	1/1/2020	0

To date, no fleet owners have upgraded to fuel efficient hybrids because they are not widely available for most heavier vehicle types; therefore, staff is proposing to extend this credit until January 2020. The definition of fuel efficient hybrids is also being revised to be consistent with criteria used for incentive funding for heavy duty advanced technology vehicles.

Extending the early action credits would recognize fleet owners that have complied by taking early action to replace trucks or retrofit engines, and extending the credits for adding cleaner vehicles would provide additional incentive to encourage fleet owners to upgrade with alternative fueled or advanced technology vehicles. Supporting the commercialization of advanced technology vehicles is a key part of achieving future air quality improvements and a sustainable transportation future. Extending the downsizing credits would provide a compliance pathway for fleet owners that have not fully recovered from the recession, and would increase the likelihood that the owner would upgrade to a 2010 model year engine earlier than under the existing regulation.

The current regulation allows owners to defer compliance for trucks by applying credits earned from installing retrofit PM filters on off-road equipment that are subject to title 13, CCR, section 2449; however, staff is not proposing to change the expiration date for this credit so that consistency is maintained in how the credits are treated in the two regulations.

9. Addressing Compliance for a PM Filter Retrofit that is Recalled

Staff is proposing to address compliance for retrofit PM filter recalls that are not repaired or replaced by the manufacturer. Owners that have installed a retrofit PM filter that becomes subject to a recall under title 13, CCR section 2701 (a)(35) and that the retrofit manufacturer is unable to replace or repair the recalled PM filter would be permitted to operate the affected vehicle up to five years from the date of the recall. The owner would be required to carry documentation with the affected vehicles at all times. This proposed amendment would protect the owner that acted in good faith to comply with the regulation.

10. Other Minor Changes

Staff is proposing amendments to several definitions to define new terms that are associated with the amendments outlined above. Staff is also proposing to modify other sections to clarify existing requirements and improve enforceability of the regulation and updating reporting and recordkeeping requirements.

IX. PUBLIC PROCESS FOR DEVELOPMENT OF PROPOSED AMMENDMENTS

Staff conducted a series of statewide workshops and meetings to solicit comments from affected stakeholders regarding the proposed amendments to the regulation. Written comments that were received shortly before and after the workshops are provided in Appendix H. In addition, staff continues to offer comprehensive outreach to assist and educate fleet owners on actions needed to comply with diesel fleet regulations, and the financial incentive programs that are available. These efforts are described further below.

A. Public Workshops

Since December 3, 2013, staff held five public workshops statewide to discuss proposed amendments to the regulation. Table IX-1 shows the dates and locations of the workshops.

Table IX-1: Public Workshop Dates and Locations

Workshop Dates	Locations
December 3, 2013	Diamond Bar
December 4, 2013	Sacramento (webcast)
December 5, 2013	Redding
December 10, 2013	San Diego
December 12, 2013	Fresno (video link to Bakersfield and Modesto)

The Sacramento workshop was webcast and the Fresno workshop provided a live video feed to locations in Modesto and Bakersfield.

B. Other Meetings

In addition to the workshops noted above, staff discussed and/or met with a number of companies, trade groups, and industry organizations about proposed amendments to the regulation. Staff met with individuals and representatives of the following.

American Lung Association of California
Better World Group
California Air Pollution Control Officers Association
California Cattlemen's Association
California Citrus Mutual
California Cotton Ginners and Growers Association
California Farm Bureau Federation
California Fleet Solutions
California Tow Truck Association
California Trucking Association
Coalition for Clean Air

Construction Industry Air Quality Coalition
Manufacturers of Emission Controls Association
Natural Resources Defense Council
Nisei Farmers League
Robinson Enterprises
Union of Concerned Scientists
Western Agricultural Processors Association

In addition, staff attended Town Hall meetings in Chico, Davis, Yuba City, and Fairfield. Per the request of Assemblyman Dan Logue, staff also met with representatives from five trucking companies to assist with compliance and obtain feedback on the regulatory requirements. The concerns and suggestions made by participants at these meetings included the impact of the regulation on affected businesses in rural areas, the role of funding programs, and potential changes to the regulation.

C. On-Going Outreach Efforts

Since the development of the regulation, ARB has made many efforts to provide compliance assistance and outreach to diesel fleet owners. In 2011, a branch at ARB was created to raise awareness of the regulation as well as other diesel fleet regulations and provide compliance assistance and information by use of multiple innovative outreach mechanisms. Staff has designed an outreach program that serves as a one-stop source of information for all diesel fleet regulations and incentive programs, and assists fleet owners in understanding regulation requirements in a timely, accurate, and plain language format. ARB's multi-pronged compliance assistance approach involves a call center, a dedicated website, distribution of written materials through dealers and other state and local agencies, direct mailings, training and webinars throughout the State, and more recently through a media outreach contract. Staff also participates in special campaigns involving enforcement and media activities.

After the Board meeting, staff will continue its outreach efforts with an updated plan to inform fleet owners about any regulatory changes. Staff will also inform fleet owners of any new or expanded incentive funding opportunities the proposed amendments might provide. Staff will also continue to work with industry representatives and associations on additional ways to educate stakeholders on the amendments to the regulations.

The outreach program is constantly striving to increase collaborations and form new partnerships since many of the diesel fleet regulations have annual deadlines continuing through 2023. To ensure success in 2014 and onward, staff will remain attentive to stakeholder needs, develop additional means of outreach, and continue the extensive compliance assistance efforts described in detail below.

1. Call Center (866-6DIESEL Hotline)

The 1-866-6DIESEL hotline is the primary channel for informing the public about how to achieve full compliance with ARB's suite of diesel regulations. This resource is prominent among the regulated community, particularly small fleet owner/operators who

account for 82 percent of total calls. Staff provides support and compliance assistance on a personalized level in English, Spanish and Punjabi.

In 2013, the hotline phone system and equipment was modernized to accommodate the high volume of calls received during peak call periods. Callers receive electronic assistance in the form of menu driven frequently asked questions and tips. This provides assistance to most questions on a 24/7 basis and minimizes backlog for callers who want more personalized answers. In addition, the upgrade has improved call management, and permits supplementary staff during peak periods during hotline hours of Monday through Friday, 8:00 am to 5:00 pm.

Since 2011, staff fielded 124,279 calls. Table IX-2 provides a breakdown of calls by year and language. Information collected from callers is also analyzed and used to design future publications and webpage content.

Table IX-2: Annual Breakdown of Calls to 866-6DIESEL Hotline

Outreach Year	English	Spanish	Punjabi	Total
2011	24,502	2,066	102	26,670
2012	36,664	4,134	406	41,201
2013	48,719	6,975	711	56,405
Total	109,885	13,175	1,219	124,279

2. Truck Stop Website

The Truck Stop serves as a standalone resource and companion for the Diesel hotline. Information is available in both English and Spanish, and combined, the main pages for each of the two language portals received 120,523 web hits in 2012 and 175,000 hits in 2013. Web content is updated regularly with new information posted in the “What’s New?” section on Truck Stop’s main page. The website contains detailed information on regulation requirements and compliance options, as well as compliance tools, including a fleet calculator, instructional videos, and relevant info-graphics. A web form allows fleet owners to requests tailored compliance responses either by email or from the hotline. Staff handles an average of 500 emails per month. The Truck Stop is optimized often to enhance user experience, improve usability, and deliver quality content.

3. Written Materials and Mail Outs

Staff prepares written materials and mail outs to assist owners in understanding regulation requirements in a timely, accurate, and plain language format. Printed and online materials have a professional, consistent design for program recognition. Easy-to-understand handbooks, postcards, regulatory applicability flowcharts, information packets, fuel pump toppers, and posters are examples of how we try to reach fleet owners. Since 2012, staff prepared and mailed seven mail-outs to announce approaching compliance deadlines to fleet owners. The December 2013 mail out informed fleet owners of good faith efforts to comply and proposed regulatory changes

to nearly 200,000 truck owners. Each mail out initiated a surge in call volume to the Diesel Hotline and an uptick in web usage.

4. Enhanced Enforcement Outreach Events

Statewide roadside joint enforcement and outreach events have garnered balanced news media coverage, including television, radio, print, online and trade publication pieces that have reached millions of people in California and beyond. Vehicle owners receive outreach materials and have an opportunity to discuss requirements specific to their fleet with staff. Staff has also participated in talk shows on satellite radio stemming from these efforts.

5. Training and Presentations at Business Events

A series of six training courses provide fleet owners guidance on complying with diesel equipment regulations are offered in a classroom setting throughout the state and in a webinar format. Since 2012, staff conducted 400 classes to train over 13,000 attendees. Classes were held in 24 California counties and 62 cities in California and at 22 out-of-state locations (including Mexico). Webinars are offered routinely on topics of current interest. At the request of industry and trade associations, staff has also presented information and provided compliance assistance at 80 business events and technical forums.

6. Media Strategies Contract

In 2012, ARB issued a $1.6 million contract to develop and implement a comprehensive media and information outreach campaign. The contractor has conducted research, and using the attitudes, opinions and behaviors of identified target audiences has designed an imaginative media outreach campaign consisting of television, cable, radio, web, and print material. The purpose of the media campaign is to assist ARB in informing the trucking community about the regulation and motivate them into compliance.

Using themes that resonate with the trucking community, the contractor has designed and produced outreach materials, including tip pads, point of sale materials, and campaign posters to display at 1,000 locations in California including truck stops, dealers, and truck part stores. Since November 2013, the contractor has deployed pump toppers at 43 Truck Stops throughout California, and has delivered prominent print and web advertisement placement in several trade publications including Spanish and Punjabi.

A significant component of this campaign includes coverage of upcoming deadlines and requirements on broadcast television, cable channels airing in the Los Angeles, Bay Area, Central Valley and Northern California media markets, and XM Satellite Radio for nationwide coverage.

X. OTHER STAKEHOLDER CONCERNS AND UPDATE

In addition to the economic concerns raised by many stakeholders, concerns regarding diesel particulate filter effectiveness, the availability of used trucks, and the need for enforcement were also raised. This chapter addresses these concerns.

A. Concerns with Diesel Particulate Filters

At the Board hearing, many stakeholders expressed concerns regarding the effectiveness, reliability, and cost of PM filters. In particular, several commenters stated that PM filters reduced the horsepower and fuel economy of their engines, caused engine failures, or resulted in a fire. Some indicated that diesel particulate filters are not a mature technology and have reliability problems that lead to costly downtime and additional maintenance needs. These comments on poor reliability focused both on retrofit and OEM PM filters.

1. Retrofit Verification and Warranty Data

Filtration of PM emissions is a technique that has been around for decades. PM filters are a mature technology and have been installed in millions of vehicles across the United States and in many parts of the world to comply with emissions standards for new vehicles. PM filters can also be retrofit to in-use vehicles, and the use of retrofits in California has been proven effective. Properly functioning diesel particulate filters reduce diesel PM emissions by 98 percent or more.

Making sure that retrofit PM filters work properly in California has been one of staff's highest priorities over the past decade. Every retrofit PM filter that is installed on a vehicle has gone through ARB's rigorous verification program that requires manufacturers to demonstrate that their equipment works effectively, both in the laboratory and over the road. Retrofit manufacturers sometimes express concern that the verification process is burdensome and slow; however, the process is designed to be as comprehensive as possible to minimize problems once the retrofits enter the marketplace. In addition to verification, manufacturers of verified PM filters must also offer comprehensive warranty coverage for their products that includes any engine damage caused by the retrofit. For heavy heavy-duty engines, the minimum warranty period is 5 years or 150,000 miles.

Despite this robust verification process, there have been isolated issues with some retrofits and their installation. The failure and associated recall of the Cleaire Longmile filter substrate (which was unique in its design and construction among all retrofit OM filters) is the most visible example. In this case, Cleaire initiated a voluntary recall program that removed these filters from operation in California.

Despite the visibility of that recall, the overwhelming majority of filters operate as designed. Warranty report data demonstrate the overall reliability of retrofit PM filters, as shown in Table X-1 below. ARB records indicate 90 different retrofit models have been offered for sale in California, and since 2000 almost 50,000 units have been sold.

About 75 percent of these retrofit PM filters are verified Level 3 devices (providing greater than 85 percent control), while the remaining retrofits are lower level devices that provide a lesser level of control. While warranty claims have been submitted for 11 percent of all retrofit PM filter applications, the vast majority of these claims are for consumable components in the retrofit system like fuses or gaskets that are easily replaced. ARB data shows that about half a percent of total retrofit PM filters have required replacement during the warranty period, as shown in Table X-1.

Table X-1: Retrofit Sales and Warranty Claims Overview

Total Verified Retrofits	Total Retrofit Sales 2000-2012 All Programs	Total Level 3 DPF Sales 2000-2012 All Programs	Total Warranty Claims*	Total Warranty Claims for the DPF Core
90	49,648	36,154	5,700 (11%)	222 (0.6% of all DPFs)

* All submitted claims (valid, denied, and goodwill) for all components, including consumable components such as fuses, glow plugs, and O-rings.

2. Retrofit Investigations and Role of Proper Maintenance

When a fleet owner has a concern about retrofit performance that has not been resolved through discussions with the manufacturer and installer, staff investigate and work to resolve the issue. ARB staff acts as a liaison to installers and manufacturers for program related issues, and oversees the training that manufacturers and installers offer to end-users. Through this work staff conducts investigations of retrofit issues in on-road and off-road applications. Staff's experience underscores the importance of ensuring that engines are in proper repair, and retrofit PM filter maintenance schedules are followed. Staff's experience indicates that while problems similar to those voiced at the October hearing can occur, when engines are properly maintained, and retrofit PM filters are properly installed and maintained, these problems can be minimized.

3. OEM PM Filters

ARB has an active program for certifying new diesel engines to strict emissions standards. All on-road diesel engines have been equipped with diesel particulate filters since 2007. There are now hundreds of thousands of trucks subject to the Truck and Bus regulation that are equipped with diesel particulate filters as manufactured and operate in California. To sell new engines in California, engine manufacturers must first certify their engines through ARB. This requires that the manufacturers conduct durability and emissions testing, provide warranty coverage, submit warranty reports to ARB, and conduct in-use testing. These warranty reports demonstrate that over the period of 2007-2010, warranty claims were filed for about 4 percent of diesel PM filters or filter components sold on new engines.

4. Staff Investigation

In response to concerns expressed by industry stakeholders, staff is conducting an investigation that includes an evaluation of many different types of information including warranty data, emissions testing data, roadside surveys designed to identify the prevalence of PM filter concerns in the California fleet, and interviews of selected fleet owners, including fleet owners expressing concerns during the workshops, fleet owners that are known to have resolved concerns about filters, and fleet owners selected at random. Results to date will be presented to the Board in April 2014 prior to the consideration of the proposed amendments.

B. New and Used Truck Availability

Another concern expressed by industry stakeholders in the workshops was whether or not there is a sufficient number of compliant vehicles available to meet regulatory obligations. Staff's analysis suggests that no more than 50,000 additional trucks would need to be replaced in any of the next 5 years to achieve compliance in California. In most years the totals would be less. There are more than enough trucks available for fleet owners to purchase to comply with the regulation, because both new and used trucks are regularly sold across state lines, used trucks from across the United States can be sold in California, and a large number of compliant used trucks are sold nationally every year.

There are a sufficient number of compliant used trucks available for sale in California. Staff estimates in 2012 more than 300,000 used class 7 and class 8 trucks were sold in the United States in 2012; in that year about 30 percent of those used trucks had 2007 model year or later engines and met PM regulatory requirements (ACT, 2012). This percentage increases every year. Depending on demand, more of these trucks could be sold in California.

Additionally, there are also a sufficient number of compliant new trucks available for sale in California. National truck sales published by Wards Auto shows there were 242,000 new trucks (GVWR >26,000 lbs) sold in the United States in 2012 with more than 110,000 lighter trucks sold (Ward, 2012). All new trucks have OEM PM filters and meet the final compliance requirement of the regulation, and manufacturers have capacity to produce a sufficient number of new trucks to meet projected demand, and to sell these trucks in California.

C. Enforcement

Enforcement plays a major role in providing a level playing field for fleet owners subject to the Truck and Bus regulation. Enforcement is conducted at weigh stations, fleet facilities, along roadways, at border crossings, and other locations. Penalties for non-compliance can be substantial including fines of at least $1000 per month of non-compliance per vehicle, DMV vehicle registration title stops, and other actions. By comparing vehicle registration and reporting data, staff has identified potential companies that may be non-compliant with regulation requirements. Staff anticipates contacting these fleet owners in 2014 to help facilitate compliance, monitoring these

fleet owners to determine if they register in TRUCRS, and following up with these fleet owners through compliance assistance programs and if necessary enforcement actions to ensure compliance.

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