

 *California Environmental Protection Agency*  
**AIR RESOURCES BOARD**

**STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED  
RULEMAKING**

**PROPOSED AMENDMENTS TO THE TRUCK AND BUS REGULATION,  
THE DRAYAGE TRUCK REGULATION AND THE TRACTOR-TRAILER  
GREENHOUSE GAS REGULATION**



Mobile Source Control Division  
Heavy-Duty Diesel Implementation Branch

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## **EXECUTIVE SUMMARY**

California faces many air quality challenges, whether they be meeting federal air quality standards, reducing premature mortality, addressing localized risk, or reducing greenhouse gas emissions. The Air Resources Board (ARB or Board) has put into place a series of comprehensive regulations and programs to meet these challenges. While nearly all diesel engines in the state are included in this program, trucks and buses represent the largest share of emissions and vehicles. As a result, California's program targeting emission reductions from the nearly one million existing diesel trucks and buses that operate on California roads each year is arguably the most important component of ARB's program to reduce emissions from diesel vehicles. These include the Truck and Bus regulation that reduces exhaust emissions from most heavy-duty diesel vehicles, the Drayage Truck regulation that reduces exhaust emissions from larger tractors that enter ports and intermodal rail yards and the Tractor-Trailer Greenhouse Gas regulation that reduces greenhouse gas emissions from long-haul tractor trailer combinations. This comprehensive program is intended to significantly reduce emissions from existing diesel vehicles throughout the state through a mix of exhaust and vehicle retrofits and vehicle turnover, so that by 2023, California has the cleanest, most efficient diesel fleet in the world.

The need to reduce emissions from trucks continues to be significant. These vehicles are a major source of emissions. They contribute substantially to violations of the ambient air quality standards for both fine particulate matter (PM<sub>2.5</sub>) and ozone. They also contribute to localized health risk associated with exposure to diesel particulate matter and to premature deaths associated with exposure to ambient fine particulate matter in the air.

California and the nation have been in an economic recession that was not anticipated when these diesel truck regulations were approved by the Board in 2007 and 2008. The recession has had a significant impact on companies that rely on diesel engines – whether it is trucking and transportation businesses, construction companies, or airlines. Overall, businesses' revenues and employment are down, and this has reduced many fleets' ability to make the investments needed to comply.

While the current recession has been economically devastating to businesses throughout the state, it has also caused an overall reduction in both on-road and off-road diesel vehicle activity and emissions through reductions in the number of truck trips and vehicle miles traveled as well as in reductions in the number of pieces of construction equipment working on projects. Emissions are lower today because of the recession than what we had previously assumed. Reduced emissions have provided ARB an opportunity to go back and adjust the regulations targeting diesel trucks and buses to account for reduced emissions that are occurring from less business activity.

Over the long term, the regulations are still critically important to ensuring that California meets both its short-term and long-term air quality obligations and health based goals.

Considering this, in April 2010, the Board directed staff to update the emissions inventories from trucks and off-road equipment to reflect the impact of the recession on emissions. The Board further directed staff to develop amendments to the Truck and Bus and Off-Road diesel vehicle regulations that would provide economic relief to fleets while continuing to meet the Board's air quality goals and obligations. The Board's direction included the following principles for staff to consider in proposing amendments:

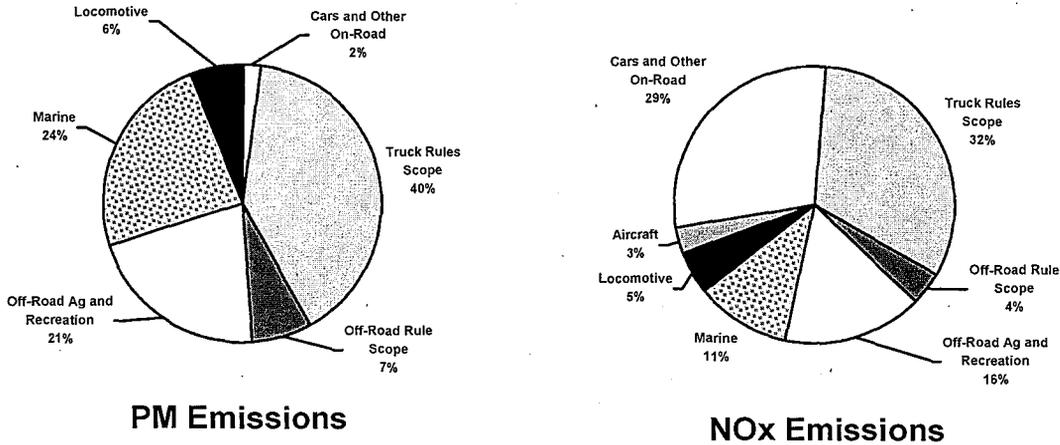
- Continue progress toward cleaner air
- Maintain public health benefits
- Meet State Implementation (SIP) commitments
- Provide incentives to achieve greenhouse gas reductions
- Improve cost effectiveness
- Lower peak year costs
- Consider cumulative impact of both regulations
- Provide most economic relief to fleets hardest hit by recession
- Ensure emission reductions as economy recovers
- Support clean technologies

To support development of the proposed amendments, staff updated the emissions inventory for trucks to assess the impact of the economic recession on emissions and to integrate new information. Through staff's assessment, it was determined that the recession has had a major impact on reducing emissions. Overall, 2010 truck and bus emissions are on average more than 20 percent lower because of the recession than we had estimated in 2008.

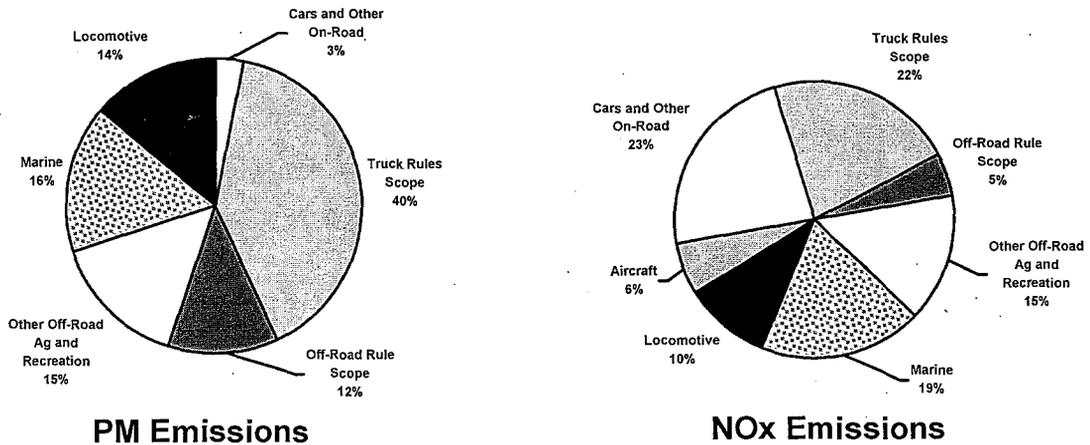
A similar assessment was made for off-road vehicles and can be found in the Initial Statement of Reasons for Proposed Amendments to the Regulation for In-Use Off-Road Diesel-Fueled Fleets and Off-Road Large Spark Ignition Engine Fleet Requirements (ARB, 2010b). In that assessment, staff found that the recession has reduced activity and emissions in the construction sector by more than 50 percent.

Despite these changes to the emissions inventories, heavy-duty trucks and buses continue to be the largest contributor to emissions in California, both in 2010 and 2020, as shown in Figure E-1 and Figure E-2. In addition, reducing emissions is necessary to reduce premature deaths associated with exposure to fine PM (PM<sub>2.5</sub>) and near-source exposure to diesel PM.

**Figure E-1: Truck Contribution to 2010 Statewide Mobile Source Emissions (Particulate Matter and NOx Without Regulations)**



**Figure E-2: Truck Contribution to 2020 Statewide Mobile Source Emissions (Particulate Matter and NOx Without Regulations)**



The SIP is California's roadmap towards achieving federal clean air standards by the applicable deadlines. To assess progress towards meeting the emission reduction obligations in the SIP, staff evaluated how much lower emissions would be from the revised inventory and the recession than were anticipated at the time the regulations were adopted. Any excess emission reductions achieved are referred to as an emission margin. The margin defines how much economic relief could be provided under the regulations while still meeting the legal emission reduction requirements of the SIP. To allow for a comparison of different pollutants (PM and NOx), the margin is calculated, by air basin, in NOx equivalent emissions. Table E-1 shows the emission margin for the South Coast and San Joaquin Valley air basin for 2014, which is the attainment date for these two air basins to meet federal PM<sub>2.5</sub> standards. Based on this analysis, it is feasible to significantly reduce the economic impact on affected fleets while meeting SIP obligations.

**Table E-1: Emissions Are Less Than the 2014 SIP Target  
Existing Truck and Off-Road Regulations, Including Recession**

Air Basin	Equivalent Tons of NOx Below Combined SIP Target
South Coast	62
San Joaquin Valley	40

The U.S. EPA has recently concluded, based on the published and peer reviewed scientific literature, that long-term exposure to PM2.5 is causally associated with premature mortality. A causal relationship means it has the highest scientific level of certainty. The U.S. EPA also found that premature deaths caused by PM2.5 occur at levels well below the Federal air quality standard for PM2.5. The U.S. EPA estimates that about 63,000 to 80,000 premature deaths each year in the U.S. are related to PM2.5. ARB staff used the EPA methodology to estimate that long-term exposure to PM2.5 from all sources in California results in 9,200 premature deaths annually and that reducing emissions to meet the Federal standard would reduce premature deaths by 2,700 annually. Reducing PM emissions below the Federal standard would reduce the number of premature deaths even further.

After holding three workshops about the Truck and Bus regulation, one focused on school bus requirements, and 16 statewide workshops to discuss proposed amendments in conjunction with amendments to the Off-Road regulation in 2010, staff has developed a comprehensive set of amendments covering both regulations that would:

- Provide economic relief for affected on-road and off-road fleets while substantially reducing compliance costs;
- Achieve the emissions reductions needed to meet SIP commitments to attain federal air quality standards;
- Continue to reduce localized risk, and;
- Continue to reduce the impacts of diesel emissions on premature mortality.

The proposed amendments to the Truck and Bus regulation would exempt about 150,000 lighter trucks with a gross vehicle weight rating less than 26,001 pounds (most of which are operated exclusively in California) from having to meet the PM filter requirements. Instead, beginning in 2015, these lighter trucks would be required to be modernized (replaced), but not until the trucks are 20 years old or older.

For larger, heavier trucks with 1998 to 2006 model year engines, the requirements would be changed such that these trucks would only be required to have PM filters installed from 2012 to 2014. They would then be able to operate at least another 8 years (instead of 4 years, as provided with the current regulation) before needing to be replaced with a truck meeting the 2010 model year emissions standard or be retrofit

to have equivalent emissions. The remaining heavier trucks with 1997 and older engines would be replaced when 20 years old or older starting in 2015.

Overall, by 2023 all trucks all trucks operating in California would need to have 2010 model year or newer engines, or equivalent emissions. The proposed amendments also simplify the regulation while retaining flexibility for fleets to determine which vehicles to retrofit or modernize. The regulation would continue to have provisions, such as reduced fleet size credits that would now expire in 2016 rather than in 2014 under the current regulation, which should reduce the annual compliance requirements for fleets most affected by the recession. For example, if a fleet has 20 percent fewer trucks operating than it did in 2006, then no action would be required for 20 percent of its remaining trucks until 2016. A fleet that has 40 percent fewer trucks would have no action required for 40 percent of its remaining trucks until 2016. The regulation also continues to provide incentives for the early retrofit of existing trucks in order to achieve early emission reductions.

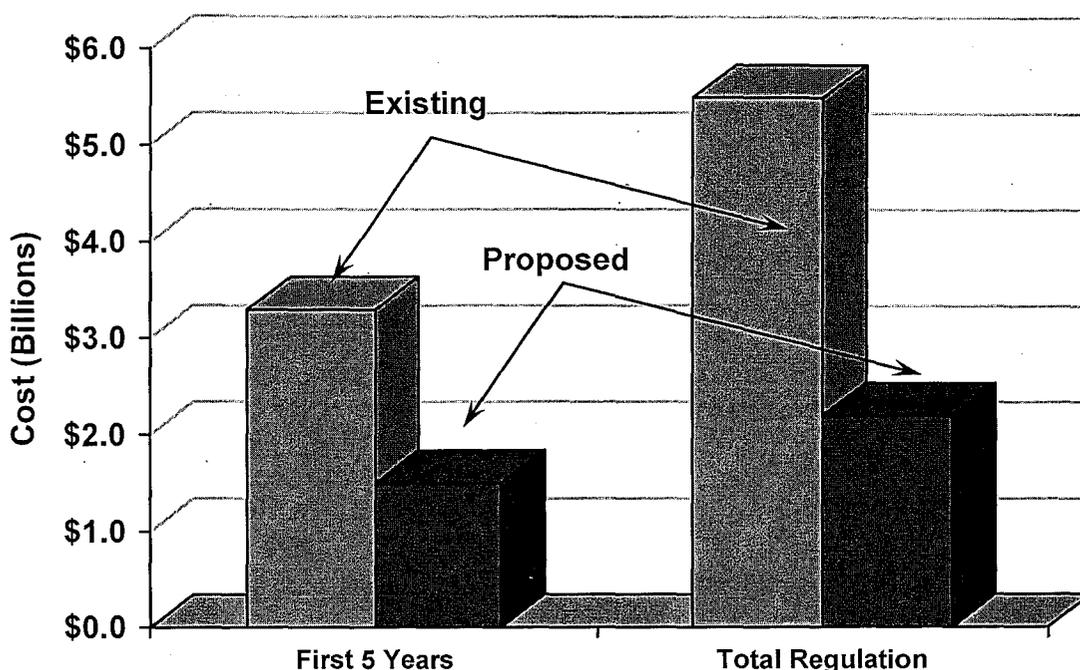
The Drayage Truck regulation would eliminate the 2014 requirement to modernize all trucks visiting ports or intermodal rail yards to 2007 model year engines or newer, and would instead align this requirement with the Truck and Bus regulation. Drayage trucks with PM filters would now comply until 2020 rather than having to upgrade the truck again by 2014. The proposed amendments would also include changes to prevent trucks from circumventing the regulation by exchanging drayage cargo with dirty trucks outside the port or rail facilities, a practice commonly known as "dray-off."

The proposed amendments to the Tractor-Trailer GHG regulation would provide fleets a new option to begin the phase-in of the trailer retrofit requirements by extending the reporting period another year, extend the deadline for using low rolling resistance tires for existing trucks and trailers and would make other changes that provide more flexibility for fleets to comply. The Tractor-Trailer GHG regulation currently allows owners of large fleets of 2010 and previous model year trailers to phase-in compliance from 2010 through 2015. In order to participate in this large fleet compliance schedule, an owner was required to submit to ARB a compliance plan by July 1, 2010. The proposed amendment would establish a second large fleet compliance schedule allowing owners of these trailers to phase-in compliance from 2011 through 2015. To participate in this second phase-in schedule an owner would be required to submit a compliance plan by July 1, 2011. The proposed amendments would delay the low rolling resistance tires requirements for 2010 and previous model year trailers from January 1, 2011 to January 1, 2017. In addition, the compliance date for retrofitting 2010 and previous model year tractors with low rolling resistance tires would be extended from January 1, 2012 to January 1, 2013.

The proposed amendments to the Truck and Bus regulation would provide substantial economic relief to all affected fleets. The proposed amendments would eliminate the PM filter requirements for lighter trucks and, for the next decade, would only require modernization of engines that are 20 years old or older.

Overall, the estimated compliance costs of the Truck and Bus regulation over the next five years would be reduced by 50 percent and would be reduced by about 60 percent over the life of the regulation. Figure E-3 shows how the average costs of the regulation would decline compared to the original estimates for the current regulation.

**Figure E-3: Cost of Proposed Truck and Bus Regulation Down Substantially**



Similarly, aligning the requirements of the Drayage Truck regulation with the proposed amendments to the Truck and Bus regulation would lower costs for drayage truck operators by extending the useful life of their already retrofitted trucks an additional six years and by eliminating the requirement to modernize to a truck with a 2007 model year engine or newer by 2014.

Parallel amendments to the Tractor-Trailer GHG regulation would improve compliance flexibility and would not result in significant changes in compliance costs.

Overall, the regulations would continue to provide significant emissions reductions that are necessary to meet California's air quality obligations and goals. The proposed amendments would reduce the emissions margin to zero in the San Joaquin Valley and to 5 tons/day in the South Coast. Because the combined margin for trucks and buses and off-road equipment is minimized, maximum relief is provided while still meeting SIP legal obligations.

In addition, the truck regulations would continue to provide significant health benefits by reducing premature mortality from PM<sub>2.5</sub> exposure and localized risk from diesel PM. Staff estimates that 3,500 premature deaths (2,700 to 4,400 with a 95 percent

confidence interval) would be avoided by implementation of the amended truck regulations from 2010 to 2025. This estimate is based on United States Environmental Protection Agency's (U.S. EPA) new risk assessment methodology (U.S. EPA, 2010), and includes the most recent air quality data available (2006 to 2008) and the latest emissions inventory estimates. Staff also expects localized risk to be reduced commensurate with the expected diesel particulate matter (PM) emission reductions.