

Proposed Statewide Diesel Truck and Bus Regulation


Southern California Clean Vehicle
Technology Expo

Ontario, California

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California Environmental Protection Agency

 **Air Resources Board**



Overview

- ◆ Need for emissions reductions
- ◆ Proposed regulation
- ◆ Emissions benefits and costs
- ◆ Next steps

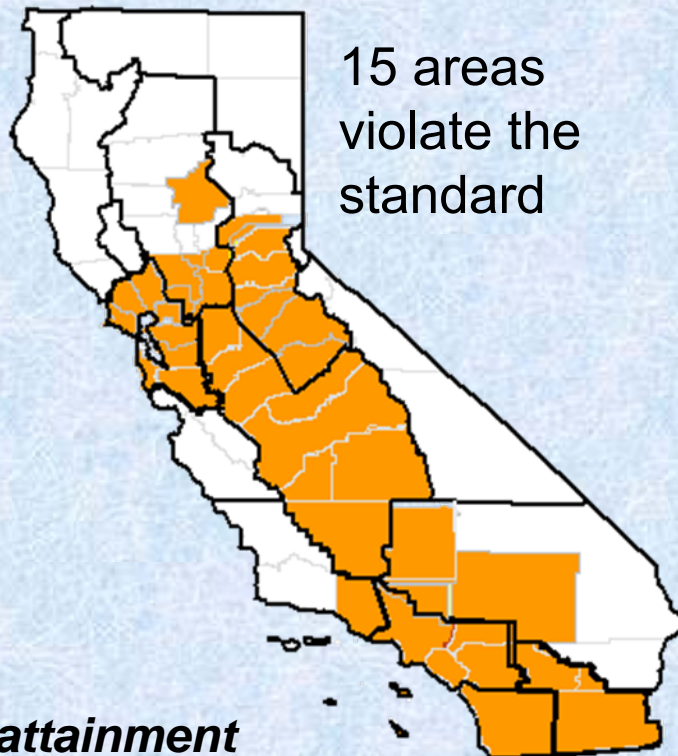


Need for Emissions Reductions

- ◆ Trucks are the largest source of diesel particulate matter (PM) in California
 - ◆ Diesel particulate matter contributes to premature death, cancer and other adverse respiratory health impacts
 - ◆ Diesel Risk Reduction Plan designed to reduce health risk caused by diesel particulate
- ◆ Trucks are the largest source of oxides of nitrogen (NOx) in California
 - ◆ NOx emissions cause ozone and PM2.5 formation
- ◆ Many areas of the state don't meet clean air standards

Area Designations for National Ambient Air Quality Standards for Ozone and PM2.5

8-Hour Ozone



PM2.5 Annual



-  **Nonattainment**
-  **Unclassified/Attainment**

Compliance with the State Implementation Plan (SIP)

- ◆ Proposed regulation is most important SIP commitment in South Coast and San Joaquin Valley
 - ◆ Early PM and NO_x reductions for PM_{2.5} attainment in 2014
 - ◆ NO_x reductions for ozone in 2017, 2020, and 2023
- ◆ Benefits of regulation assessed relative to inventory used at the time SIP was developed

In-Use Diesel Regulatory Activity

- ◆ Urban Buses (2000)
- ◆ Garbage Trucks (2003)
- ◆ School Bus Idling (2003)
- ◆ Stationary Engines (2004)
- ◆ TRUs (2004)
- ◆ Truck and Bus Idling (2004)
- ◆ Portable Engines (2004)
- ◆ Transit Fleet Vehicles (2005)
- ◆ Public Fleets & Utilities (2005)
- ◆ Cargo Handling Equipment at Ports and Rail Yards (2005)
- ◆ Off-Road Vehicles (2007)
- ◆ Port Trucks (2007)
- ◆ Statewide Truck and Bus
- ◆ Off-Road Agricultural Vehicles (scheduled for 2009)



Proposed Statewide Truck and Bus Regulation

Proposed Statewide Truck and Bus Regulation Scope

- ◆ Diesel vehicles operating in California
 - ◆ Trucks, buses, yard trucks and other
 - ◆ Interstate, intrastate, international, and other
- ◆ Vehicles greater than 14,000 GVWR and shuttle buses
- ◆ Any person, business, or government agency who owns, leases, rents, or sells a vehicle in California
- ◆ Excludes emergency vehicles, military tactical vehicles, and personal use motorhomes
- ◆ Schoolbuses subject only to PM requirements

Overview of Proposed Regulation

- ◆ Install PM controls in 2010 & 2011
 - ◆ Almost all vehicles equipped by 2014
- ◆ Phase-in 2010 model year engine equivalent
 - ◆ One turnover between 2012 and 2022
 - ◆ Exhaust retrofits if equivalent emissions
- ◆ Any of 3 compliance options for PM or NOx
 - ◆ Best available control technology (BACT), or
 - ◆ Fleet average, or
 - ◆ Limits on turnover and retrofits

Compliance Option 1: Best Available Control Technology Schedule

◆ PM BACT

- ◆ Highest level PM control technology

◆ NOx BACT

- ◆ 2010 model year emissions or cleaner
- ◆ 2004-2006 model year emissions with $\geq 85\%$ NOx reduction
- ◆ 2007 model year emissions with $\geq 70\%$ NOx reduction

- ◆ No reporting required

Compliance by December 31:	Existing Engine Model Year	Requirements
2010	Pre-1994	PM BACT
2011	2003-2004	PM BACT
2012	2005-2006 1994-1999	PM BACT NOx and PM BACT
2013	2000-2002	NOx and PM BACT
2014	Pre-1994	NOx and PM BACT
2015	2003-2004	NOx and PM BACT
2016	2005-2006	NOx and PM BACT
2017	NA	NA
2018	NA	NA
2019	NA	NA
2020	2007	NOx and PM BACT
2021	2008	NOx and PM BACT
2022	2009	NOx and PM BACT

Compliance Option 2: Turnover and PM Retrofit Limits

◆ PM BACT

- ◆ Highest level PM control technology

◆ NOx BACT

- ◆ 2010 model year emissions or cleaner
- ◆ 2004-2006 model year emissions with $\geq 85\%$ NOx reduction
- ◆ 2007 model year emissions with $\geq 70\%$ NOx reduction

Compliance by December 31:	PM BACT	NOx BACT
2010	25%	NA
2011	50%	NA
2012	75%	25%
2013	100%	50%
2014	“	60%
2015	“	70%
2016	“	80%
2017	“	80%
2018	“	80%
2019	“	90%
2020	“	90%
2021	“	90%
2022	“	100%

- ◆ Requires reporting

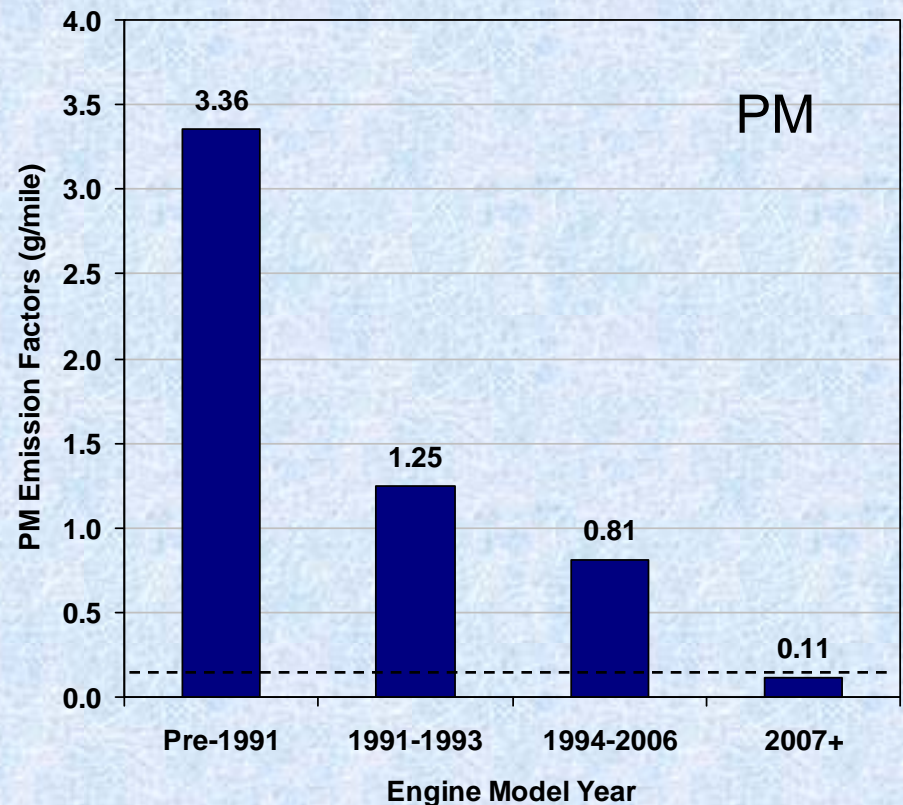
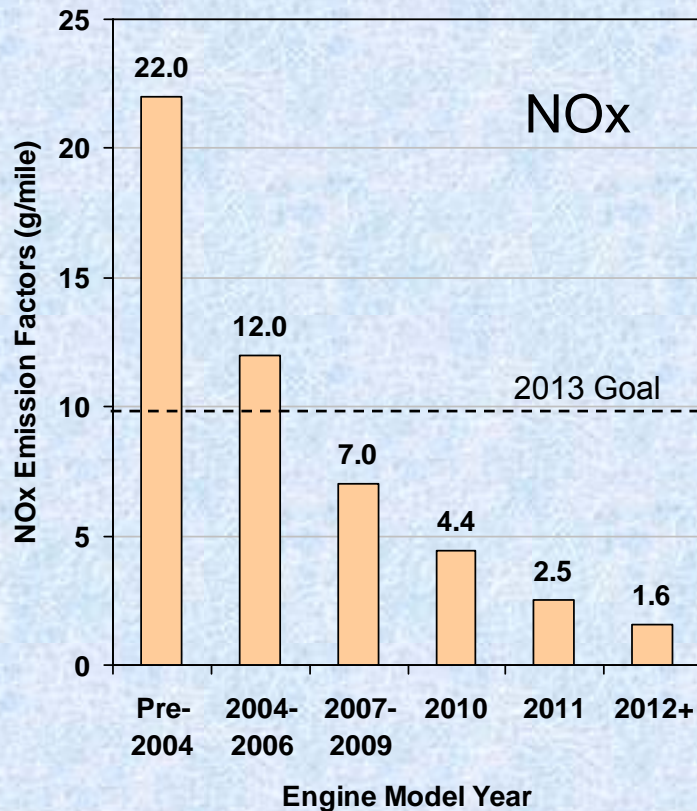
Compliance Option 3: Fleet Average

- ◆ Calculate average emissions in the fleet
- ◆ Meet a declining average
- ◆ Provides flexibility
 - ◆ Allows mix of cleaner and dirtier engines
- ◆ Staggered start dates
 - ◆ PM begins in 2010
 - ◆ NOx begins in 2012
- ◆ Reporting required
- ◆ Fleet calculator available



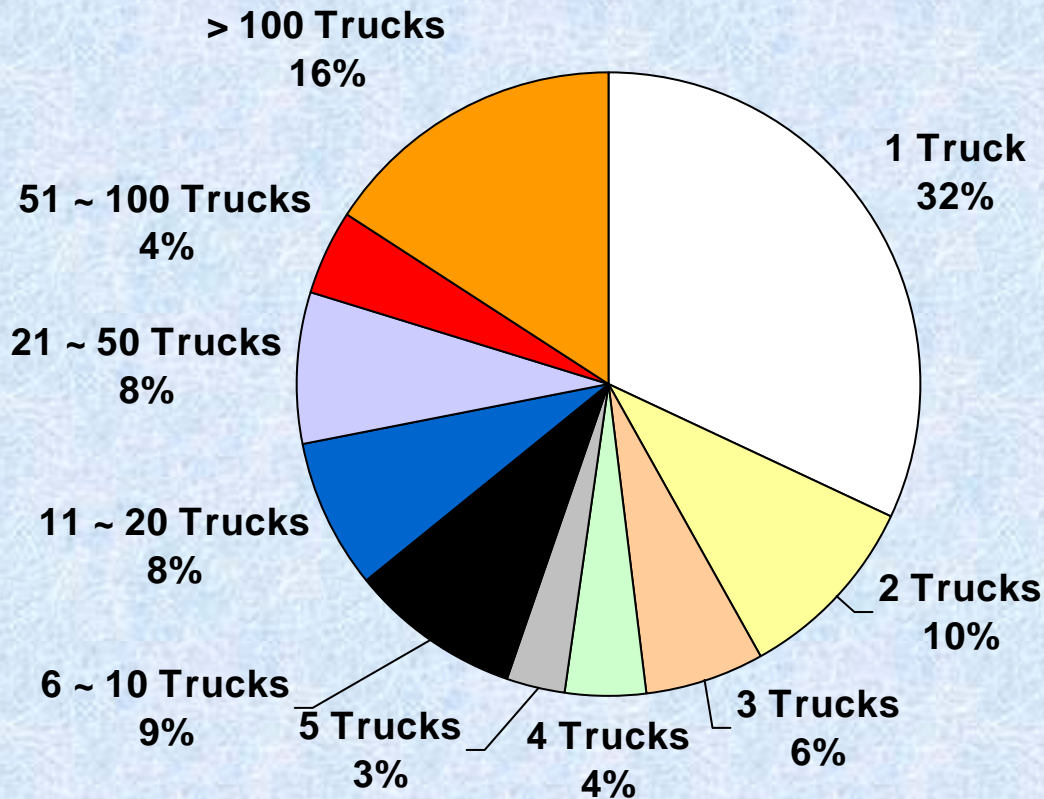
Emission Factors in Fleet Average

Class 8 Vehicles (>33,000 lbs)



Note: Most 2003 model year engines met 2004 emissions standard
Separate emission factors for smaller vehicles not shown

Number of Trucks by Fleet Size



2006 DMV DATA: HHD & MHD Truck Population

Special Provisions

Small Fleets

- ◆ Applies to fleets of up to 3 vehicles
- ◆ No NOx requirements in 2010 and 2011
- ◆ First vehicle upgraded in 2012
 - ◆ 2004 emission engine with PM control exempt until 2017
- ◆ Remaining trucks upgraded 2013-2022
- ◆ Provide additional time for 3 vehicle fleets
- ◆ Subject to reporting requirements

Special Provisions

Exemption from Turnover Requirements

Exempt Vehicle	Expires Dec. 31
Vehicle with highest level PM control by Dec. 31, 2009	2013
Class 8 vehicle operated less than 7,500 miles and less than 250 hrs per year	2020
Smaller vehicle operated less than 5,000 miles and less than 175 hrs per year	2020
Cab-over-engine tractors exclusively pulling 57-foot trailers (must be 2004 or newer)	2017
Schoolbuses	Does not expire

- ◆ Remain subject to PM requirements
- ◆ Subject to reporting requirements

Exemption from Replacement Requirements

- ◆ Vehicles used fewer than 1,000 miles and less than 100 hours per year exempt from all clean up requirements
- ◆ 2 for 1 credits for hybrid vehicles expires in 2017
- ◆ Remain subject to PM requirements
- ◆ Subject to reporting requirements

Special Provisions

Exemption from Replacement Requirements (continued)

- ◆ Vehicles operated exclusively outside non-attainment areas regardless of miles travelled
 - ◆ Exempt until 2020
- ◆ New exception for repairs
- ◆ Remain subject to PM retrofit requirements
- ◆ Subject to reporting requirements



Attainment Area Counties - Alpine, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Monterey, Plumas, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz, Shasta, Sierra, Siskiyou, Trinity, Tehama, and Yuba

Other Special Provisions

- ◆ Certain specialty farm vehicles exempt from PM requirements until 2017
 - ◆ Cotton module, spreader, silage, and other
 - ◆ Remain subject to NOx requirements
- ◆ Subject to reporting requirements

Enforcement

- ◆ Web based database for tracking vehicle records
- ◆ Provisions built into regulation to crosscheck other programs
 - ◆ DMV (registration/MCP), U.S. DOT, IRS
- ◆ Expand existing inspection efforts
 - ◆ Weigh stations, random roadside and fleet
- ◆ Audits of records
- ◆ Additional resources needed

Emissions Inventory and Benefits

Statewide Emissions Benefits

Pollutant	Year	Baseline	Tons Reduction
NOx	2014	506	130
	2023	324	104
PM	2014	18	12
	2023	10	3

Note: Baseline includes drayage truck regulation

Estimate of Statewide Costs

- ◆ Preliminary cost estimate ranges from \$4.4 to \$5.4 billion (\$2008)
- ◆ Cost effectiveness
 - ◆ NO_x: \$6,100 to \$7,600 per ton (\$3 to \$4 per lb)
 - ◆ PM: \$90,000 to \$110,000 per ton (\$45 to \$55 per lb)

Next Steps

- ◆ Staff report available October 24, 2008
- ◆ Additional meetings with stakeholders
- ◆ Board consideration December 2008



Statewide Diesel Truck and Bus Regulation Contacts

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Statewide Truck and Bus Regulation - www.arb.ca.gov/dieseltruck
Verified Devices - www.arb.ca.gov/diesel/verdev/verdev.htm