

# Statewide Truck/Bus Proposed Regulation

## Proposed Statewide Diesel Truck and Bus Regulation

Workshop Series

El Monte	-	May 21 (day)
San Diego	-	May 27 (day)
El Centro	-	May 27 (evening)
Riverside	-	May 29 (evening)
San Jose	-	May 30 (day and evening)
Redding	-	June 2 (day and evening)
Sacramento	-	June 4 (day and evening)
Fresno	-	June 10 (day and evening)

**California Environmental Protection Agency**  
**Air Resources Board**

## Overview

- ◆ Need for emission reductions
- ◆ Proposed diesel truck and bus regulation
- ◆ Emissions benefits and costs
- ◆ Next steps

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## Need for Emissions Reductions

- ◆ Reduce diesel particulate matter (PM) emissions
  - ◆ Meet goals of Diesel Risk Reduction Plan
- ◆ Reduce oxides of nitrogen (NOx)
  - ◆ Attain health based 8-hour ozone and PM2.5 standards
  - ◆ Federal Clean Air Act
  - ◆ State Implementation Plan (SIP) commitments

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

*8-Hour Ozone*

15 areas violate the standard

*PM2.5 Annual*

2 areas violate the standard

■ Nonattainment

□ Unclassified/Attainment

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## State Implementation Plan (SIP)

- ◆ Required by U.S. EPA
- ◆ SIP is a master plan developed by ARB and districts that shows how regions will meet federal clean air deadlines
- ◆ September 27, 2007 ARB adopted the ozone SIP for South Coast and San Joaquin Valley
- ◆ May 22, 2008 ARB to consider PM2.5 SIP for San Joaquin Valley
- ◆ Commitment for significant emissions reductions from trucks and buses

## Potential Health Benefits from Truck and Bus Regulation can be Significant

- ◆ Proposed regulation would reduce health risks and costs
- ◆ Without regulation from 2010 and 2020
  - ◆ Expect 11,000 premature deaths
  - ◆ Health care costs
  - ◆ Valued at \$70 to \$89 billion
- ◆ Local health risk
  - ◆ West Oakland health risk from trucks is 2 to 3 times higher than background levels
  - ◆ 2/3 of this increase is from non-port trucks

## In-Use Diesel Regulatory Activity

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>◆ Urban Buses (2000)</li><li>◆ Garbage Trucks (2003)</li><li>◆ School Bus Idling (2003)</li><li>◆ Stationary Engines (2004)</li><li>◆ TRUs (2004)</li><li>◆ Truck and Bus Idling (2004)</li><li>◆ Portable Engines (2004)</li><li>◆ Transit Fleet Vehicles (2005)</li></ul> | <ul style="list-style-type: none"><li>◆ Public Fleets &amp; Utilities (2005)</li><li>◆ Cargo Handling Equipment at Ports and Rail Yards (2005)</li><li>◆ Off-Road Vehicles (2007)</li><li>◆ Port Trucks (2007)</li><li>◆ Other Trucks and Buses (under development for 2008)</li><li>◆ Off-Road Agricultural Vehicles (under development for 2009)</li></ul> |
|---|--|



## 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

## Examples of Vehicle Types



Concrete Mixer



Dump Truck



Drill Rig



Water Truck



Hay Squeeze



Tow Truck



Reefer Van



Fuel Tank Truck



Passenger Bus

## 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
- ◆ Certain special provisions
- ◆ 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

# Statewide Truck/Bus Proposed Regulation

## 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 ≥ 85% NOx reduction
  - ◆ 2007 model year emissions with ≥ 70% NOx reduction
- ◆ Requires reporting

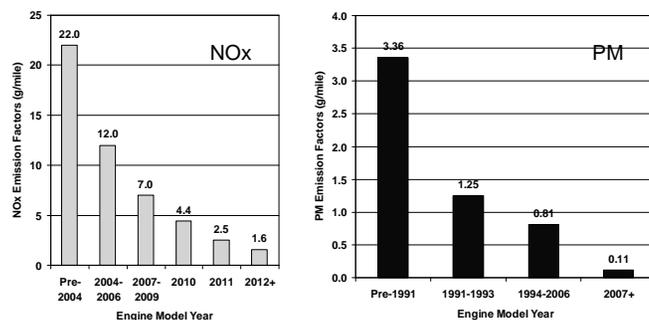
Compliance by December 31:	PM BACT	NOx BACT
2010	25%	NA
2011	50%	NA
2012	75%	25%
2013	100%	50%
2014	"	60%
2015	"	70%
2016	"	80%
2017	"	80%
2018	"	80%
2019	"	90%
2020	"	90%
2021	"	90%
2022	"	100%

## Compliance Option 3: Fleet Average

- ◆ Can be met by any method
- ◆ Provides opportunities for NOx controls
- ◆ Preserves flexibility of prior proposal
  - ◆ Allows mix of cleaner and dirtier engines
  - ◆ Same PM targets
  - ◆ Softer early NOx targets
- ◆ Staggered start dates
  - ◆ PM begins in 2010
  - ◆ NOx begins in 2012
- ◆ Reporting required

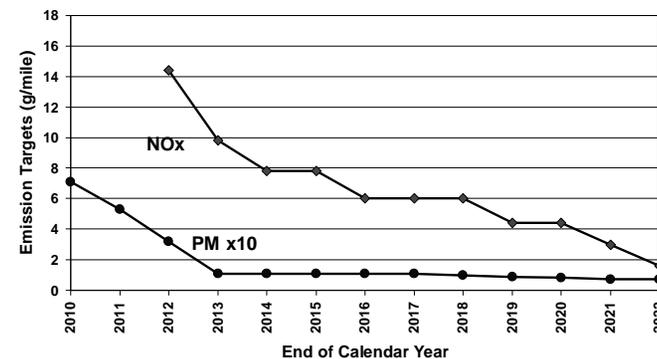


## Emission Factors in Fleet Average Class 8 Vehicles (>33,000 lbs)



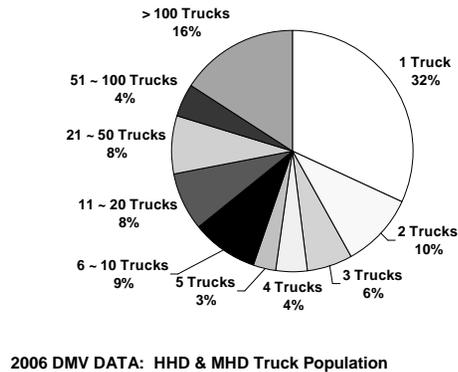
Note: Most 2003 model year engines met 2004 emissions standard  
Separate emission factors for smaller vehicles not shown

## Fleet Average Emission Targets Class 8 Vehicles



Note: Separate emission targets for smaller vehicles not shown

### Number of Trucks by Fleet Size



2006 DMV DATA: HDD & MHD Truck Population

### Special Provisions Small Fleets

- ◆ Applies to fleets of up to 3 vehicles
- ◆ Provides more time to upgrade to 2010 truck
- ◆ Exempt from performance requirements in 2010 and 2011
- ◆ First vehicle upgraded in 2012:
  - ◆ 2004 truck with PM control exempt until 2017
- ◆ Remaining trucks upgraded 2013-2022
- ◆ 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

### Special Provisions Exemption from Turnover Requirements (continued)

- ◆ Vehicles operated exclusively outside non-attainment areas regardless of miles travelled
  - ◆ exempt until 2017
- ◆ 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

## Special Provisions (continued)

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

## Additional Proposed Changes Two Engine Cranes

- ◆ Make two engine cranes subject to regulation for in-use off-road diesel fueled fleets (off-road regulation)
  - ◆ Both upper and lower engine
- ◆ Exempt from Portable engine and equipment registration requirements
  - ◆ Except for the opacity limits
- ◆ No longer be subject to the ATCM for diesel PM from portable engines

## Additional Proposed Changes Public Agency and Utilities (PAU)

- ◆ Modify Diesel PM control measure for municipality or utility on-road heavy-duty diesel vehicles
  - ◆ Light heavy-duty engines would be subject to the truck and bus rule unless the owner opts into the PAU regulation by December 31, 2008
  - ◆ Include 2007 model-year or newer engines certified above the 0.01g/bhp-hr standard

## Reporting

- ◆ Annual demonstration of compliance for all options except BACT schedule
- ◆ Owner contact information including motor carrier number
- ◆ Vehicle and engine information
  - ◆ Make, model, model year, VIN, License plate, engine family, engine serial number, etc.
  - ◆ Emission control system information
- ◆ Mileage exemptions or NOx Exempt Area
  - ◆ Records from a tracking system, Highway Vehicle Use Tax Return, other documentation

### Enforcement

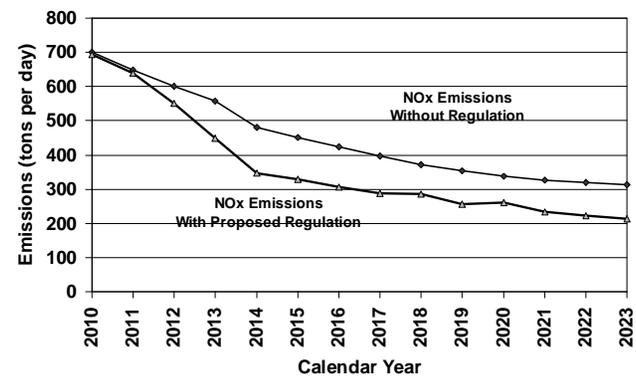
- ◆ Web based database for tracking vehicle records
- ◆ Provisions built into regulation to crosscheck other programs
  - ◆ DMV (registration/MCP), U.S. DOT, IRS
- ◆ Expand existing inspection efforts
  - ◆ Weigh stations, random roadside and fleet
- ◆ Audits of records
- ◆ Additional resources needed

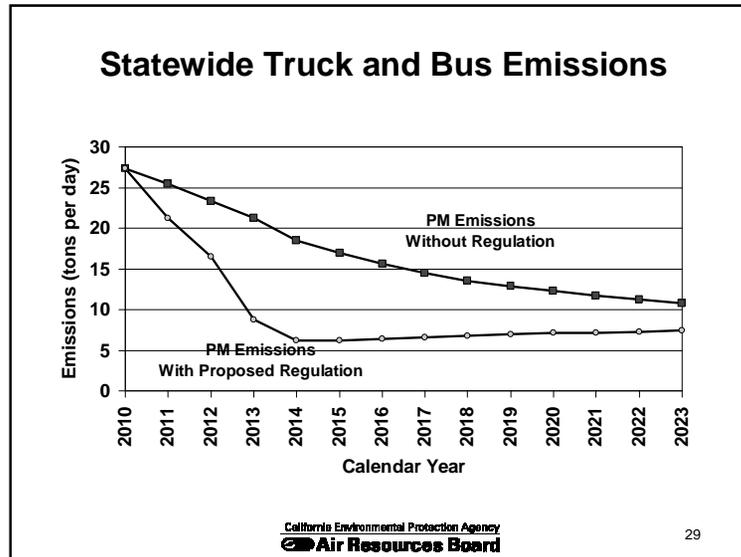
### Emissions Benefits and Costs

### Emissions Benefits

Emissions (tons per day)	2014		2020	
	NOx	PM	NOx	PM
Baseline	481	18.5	338	12.3
With Proposed Regulation	346	6.2	260	7.1
Net Reduction	135	12.3	78	5.2
Percent Reduction	28%	67%	36%	42%

### Statewide Truck and Bus Emissions





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## Preliminary Estimate of Statewide Costs

- ◆ Preliminary cost estimate ranges from \$3.6 to \$5.5 billion (\$2008)
- ◆ Cost effectiveness
  - ◆ NOx: \$5,000 to \$7,800 per ton (\$2 to \$4 per lb)
  - ◆ PM: \$74,000 to \$113,000 per ton (\$37 to \$57 per lb)
- ◆ Greatest uncertainty with estimate of affected interstate fleet population
- ◆ Plan future workshop to discuss cost methodology and inputs

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## Cost Methodology and Inventory Workshop

- ◆ Planned for July 2008
- ◆ Normal replacement costs compared to costs with regulation
  - ◆ Vehicle replacement prices
  - ◆ Salvage value
  - ◆ Retrofit costs
  - ◆ Change in operating costs
  - ◆ Other input assumptions
- ◆ Affected population

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## Planned Emissions Inventory Improvement

- ◆ Verify model assumptions
  - ◆ Use field study data to validate the age distribution assumptions
  - ◆ Use field study data to improve estimates of inter-regional travel and to accurately assess regional travel
  - ◆ Use historical truck sales, economic trends and other information to project future sales of trucks and impact on future used truck availability and emissions
  - ◆ Use additional economic trend data to improve growth estimates
- ◆ Enhance inventory detail
  - ◆ Currently split by GVWR class, body type, registration
  - ◆ Add separate categories for agricultural and Mexican trucks
- ◆ Improve benefits assessment
  - ◆ Account for fleet turnover behavior in fleet survey

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### Verified Exhaust Retrofits For On-Road Vehicles

Control Technology	Installed Cost
85% PM (Passive)	\$9,000 - \$11,000
85% PM (Active)	\$11,000 – \$20,000
25% NOx and 85% PM	\$18,000 – \$22,000
40% NOx and 85% PM	\$18,000 – \$22,000

### Proposition 1B Incentives

- ◆ Administered locally by Air Districts and Ports
  - ◆ \$760 million for trucks operating exclusively in California and greater than 50% in trade corridors
  - ◆ \$222 million allocated for trucks in FY 2007-08
  - ◆ Priority placed on retrofits and replacements
    - ◆ Up to \$50,000 for truck replacement
    - ◆ Up to \$5,000 for a retrofit
  - ◆ Projects must be completed before required to do so by a regulation
- <http://arb.ca.gov/gmbond> or (916) 444-6637

### Potential Financing Solutions

- ◆ Low-interest financing being explored to assist with costs
  - ◆ Leverages private money
  - ◆ Spread out capital costs to fleets
  - ◆ Actual state investment can be modest
- ◆ ARB working closely with State Treasurer's Office
- ◆ New revenue stream likely needed

### Fleet Survey Information

- ◆ Details on over 900 companies
- ◆ Over 7,500 vehicles
- ◆ Close to 50% of respondents have one vehicle

	Vehicles >33,000		Vehicles <33,000	
Total Miles Driven	Percent	Age	Percent	Age
<7,500	17%	20	34%	23
7,500 to 15,000	21%	13	37%	10
15,001 to 25,000	19%	11	18%	8
25,001 to 35,000	10%	24	6%	8
35,001 to 55,000	11%	14	3%	8
>55,000	21%	7	2%	9

Note: Per ARB survey data received on 6,356 HHD and 1,665 MHD vehicles

## Next Steps

- ◆ Workshop on cost methodology and emissions inventory July 2008
- ◆ Additional workshop on proposed regulation in August 2008
- ◆ Additional meetings with stakeholders
- ◆ Board consideration October 2008



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Statewide Truck and Bus Regulation - [www.arb.ca.gov/dieseltruck](http://www.arb.ca.gov/dieseltruck)  
Verified Devices - [www.arb.ca.gov/diesel/verdev/verdev.htm](http://www.arb.ca.gov/diesel/verdev/verdev.htm)

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