

California Air Resources Board



Reducing Emissions from In-Use On-Road Diesel-Fueled Heavy-Duty Drayage Trucks at California Ports and Intermodal Rail Yards

**Public Workshop
October 2007**

Air Resources Board



California Environmental Protection Agency

Overview

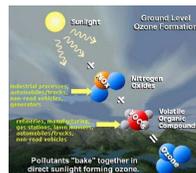
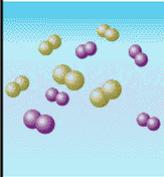
- Introductions
- Need for emissions reductions
- Proposed regulation
- Drayage truck emissions inventory
- Benefits
- Economics
- Important dates/
contact information
- Discussion



2

Need for Emission Reductions

- Diesel particulate matter (PM):
 - Diesel PM is associated with 70% of known cancer risk from all air toxics
 - Reduce near-source exposure
- Oxides of nitrogen (NO_x):
 - NO_x leads to the formation of ozone and secondary PM



3

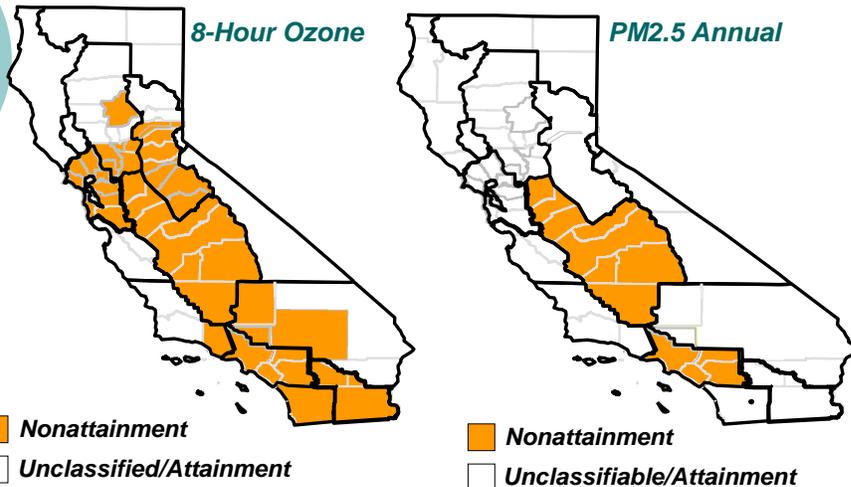
Air Pollution Reduction Regulations

- Diesel Risk Reduction Plan:
 - 85% reduction in PM by 2020
- Goods Movement Action Plan
- Federal Clean Air Act:
 - Must attain ozone and PM standards
- State Implementation Plan (SIP)



4

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



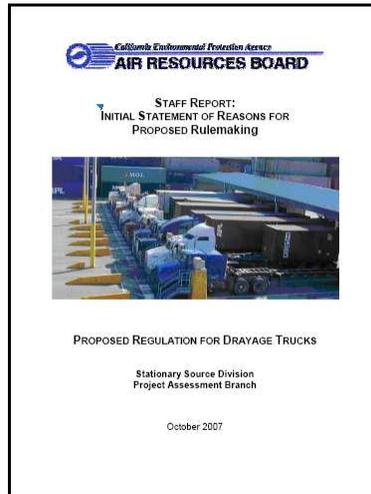
5

State Implementation Plan - Cont. SIP Targets for South Coast

- SIP:
 - In 2014, reduce MDDT and HHDT NO_x emissions by ~76 tons / day (t/d)
- South Coast Drayage Fleet:
 - By 2014, the proposed regulation would reduce NO_x emissions by 27 t/d
- Private fleet rule is expected to reduce remaining NO_x emissions to meet SIP commitments

6

Proposed Regulation



7

Which Ports and Intermodal Rail yards

<p>CA Ports: 14-total</p>	<p>Benicia, Crockett, Hueneme, Humboldt Bay, Long Beach, Los Angeles, Oakland, Pittsburgh, Redwood City, Richmond, Sacramento, San Diego, San Francisco, and Stockton</p>
<p>Intermodal Rail yards: 11-total</p>	<p>Burlington, BNSF Oakland, Commerce Eastern BNSF, Commerce UP, ICTF UP, LATC Union Pacific, Lathrop Intermodal UP, Northern Santa Fe (BNSF) Hobart, Richmond BNSF, San Bernardino, Stockton Intermodal BNSF, and Union Pacific (UP) Oakland</p>

8

Applicability / Exemptions

○ Applies to:

- Trucks
 - Diesel-fueled
 - Class 8
 - On-road
- Motor carriers
- Ports
- Class I rail yards



○ Exemptions:

- Specialized use vehicles
- Emergency vehicles
- Military



9

Compliance Schedule – Pre-2004 Trucks

Phase 1: By December 31, 2009, all drayage trucks must be equipped with:

- (A) 1994 – 2003 model year engine certified to California and federal emission standards and a level 3 VDECS;
- or,
- (B) 2004 or newer model year engine certified to California and federal emission standards.

Phase 2: By December 31, 2013, all drayage trucks must be equipped with an engine that:

- (A) meets or exceeds 2007 model year California and federal emission standards;

10

Strategies to Reduce Truck Emissions

- Truck replacement
- Retrofit technologies:
 - Must be ARB verified
 - Diesel particulate filters (DPF)
 - Level 3 (85% reduction)



11

Truck Registry

- Drayage Truck Registry (DTR):
 - Help ensures compliance
- Register:
 - Prior to Sept. 30, 2009
- Types of information collected:
 - Truck owner name, address, and contact info
 - Engine make, model, and year
 - VIN
 - Vehicle license number and state of issuance
 - Compliance information (e.g. Diesel Particulate Filter)
- Starting January 1, 2010, drayage trucks cannot legally operate on port or intermodal rail yard property without a DTR label.

12

Implementation: Truck Owner



- Truck owner responsibilities:
 - Meet Phase 1 & 2 requirements
 - Register with the DTR
 - Affix compliance sticker on truck
 - Maintain emission control device
 - Keep maintenance log
 - Ensure truck operator has motor carrier information
- Possible one-time extension

13

Implementation: Truck Operator



- Truck operator responsibilities:
 - Provide motor carrier info upon request
 - Provide emission control device maintenance log upon request from enforcement personnel

14

Implementation: Motor Carrier



- Motor carrier responsibilities:
 - Provide copy of regulation to truck owner
 - Ensure trucks are in compliance with regulation before dispatching to the port or rail yard
 - Ensure truck operator has motor carrier information
 - Keep dispatch record and allow audits

15

Implementation: Marine Terminals & Rail yards

- Marine terminals and rail yards responsibilities:
 - Collect and report data on all trucks entering facility without valid DTR label



16

Implementation: Port and Rail Authorities

- Port and rail authorities:
 - Collect non-compliant truck data from terminals and rail yards and report to ARB enforcement



17

Enforcement Responsibilities

- Enforcement entities:
 - Air Resources Board (primary)
 - Law enforcement and local Air Districts



18



ARB Enforcement

- Field inspections:
 - Compliance with regulation
 - Proper installation and operation of emission control devices
 - Emission control device maintenance records
- Terminal audits
- Primary motor carrier audits

19



Emissions Inventory and Benefits

20



Previous Emissions Inventory

- Developed models to estimate drayage truck travel activity and emissions
- Models based upon
 - Published reports / studies
 - Data provided to ARB by ports and rail yards
 - ARB surveys
 - Port of Oakland emissions scaled to smaller ports
- Updated emissions inventory
 - More detailed container movements
 - Improved Port / Rail yard specific modeling in South Coast and Bay Area

21



Emissions Inventory Updates at the Ports of Los Angeles / Long Beach and Rail Yards

- Adjusted the number of truck trips per lift
- Included non-containerized truck trips and VMT
- Improved inter-terminal truck trips and VMT based on field studies
- Improved travel miles from the ports of LA / LB based on new data
- Assessed VMT out of South Coast traveled by the ports of LA / LB trucks

22

Truck Trips (Thousand Trips / Year) at the Ports of Los Angeles / Long Beach and Rail Yards in 2007

Destinations		Previous	Updated
Container	Near Dock	494	612
	Off Dock	1,453	1,819
	Distribution / Transload*	5,422	7,126
Non-Container		0	207
Bobtail & Chassis	Off the Ports	3,790	6,055
	Inter-terminal	0	2,269

* Include container depot and street turn trips, and 10% of distribution center / transloading facility truck trips are for out of South Coast.

23

Travel Miles from the Ports of Los Angeles / Long Beach in 2007

Destinations		Previous	Updated
Container	Near Dock	5	5
	Off Dock	26	20
	Distribution Centers*	30	33.2
	Transloading Facilities*	15	33.2
Non-Container		N/A	36.9
Bobtail & Chassis	Off the Ports	15	20.6
	Inter-terminal	N/A	3

* 10% of distribution center / transloading facility truck trips are for out of South Coast.

24

VMT (Million Miles / Year) Originated and Destined to the Ports of Los Angeles / Long Beach and Rail Yards in 2007

Terminal	Air Basins	Previous	Updated
Container	South Coast	213	425
	San Joaquin Valley	0	54
	Mojave Desert	0	27
	Salton Sea	0	23
	San Diego	0	9
Non-Container	South Coast	0	77

25

Emissions Inventory Updates at the Port of Oakland

- Improved inter-terminal truck trips and VMT
- Assessed VMT out of Bay Area traveled by the Port of Oakland trucks

26

Truck Trips (Thousand Trips / Year) at the Port of Oakland and Rail Yards in 2007

Destinations		Previous	Updated
Container	Near Dock	426	426
	Distribution / Transload**	1,415	1,415
Bobtail & Chassis	Off the Ports	992	992
	Inter-terminal	0	512

** Include container depot and street turn trips, and 18% of total truck trips are for out of Bay Area.

27

Travel Miles from the Port of Oakland in 2007

Destinations		Previous	Updated
Container	Near Dock	1.5	1.5
	Distribution/Transloading (D/T)	31	31
	Regional D/T – SV**	80	45
	Regional D/T – MC**	N/A	45
	Regional D/T – SJV**	80	50
	Regional D/T – NCC**	100	75
Bobtail & Chassis	Off the Ports	Same as Container	
	Inter-terminal	N/A	1.5

** 18% of total truck trips are for out of Bay Area.

28

VMT (Million Miles / Year) Originated and Destined to the Port of Oakland and Rail Yards in 2007

Air Basins	Previous	Updated
Bay Area	77	66
Sacramento Valley	0	5
San Joaquin Valley	0	29
Mountain County	0	2
North Central Coast	0	2

29

Updated NOx (tons/year) Emissions by Air Basin in 2007

Air Basin	Previous	Updated
South Coast	5,232	12,144
Bay Area	1,925	1,757
San Joaquin Valley	76	1,949
San Diego	140	364
Other Air Basins	5	1,410
Statewide	7,378	17,624

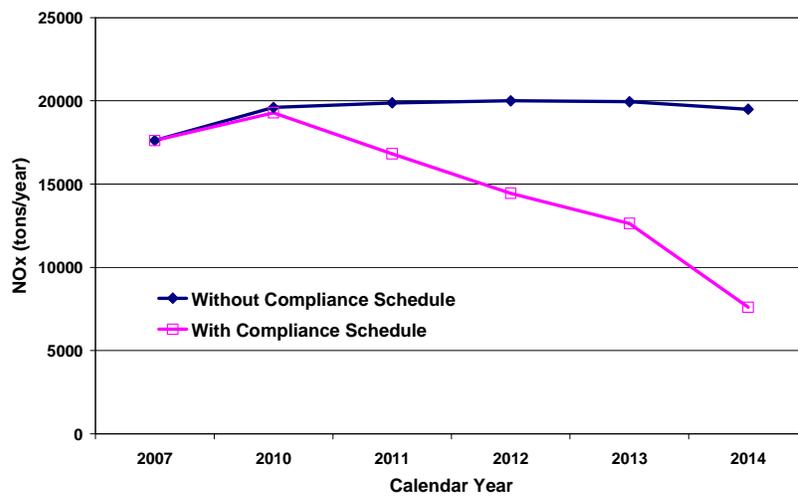
30

Updated Diesel PM (tons/year) Emissions by Air Basin in 2007

Air Basin	Previous	Updated
South Coast	267	634
Bay Area	56	51
San Joaquin Valley	2	86
San Diego	4	15
Other Air Basins	0.1	68
Statewide	329	854

31

Updated Emissions Benefits – Statewide NOx



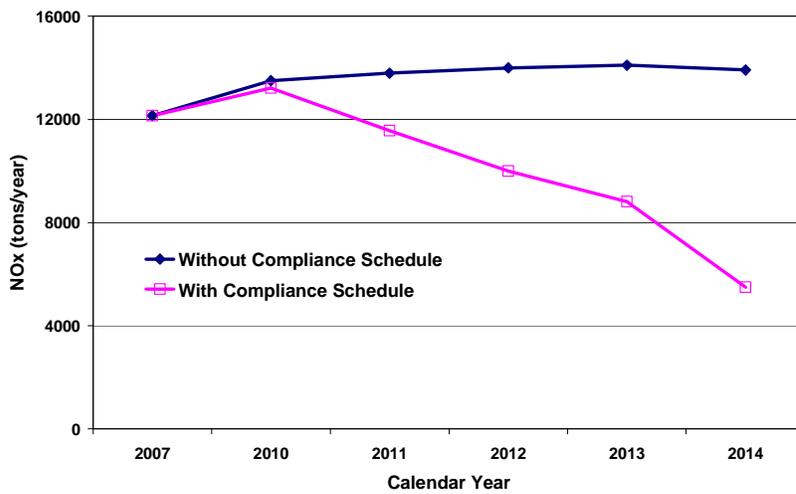
32

Updated Emissions Benefits – Statewide Diesel PM



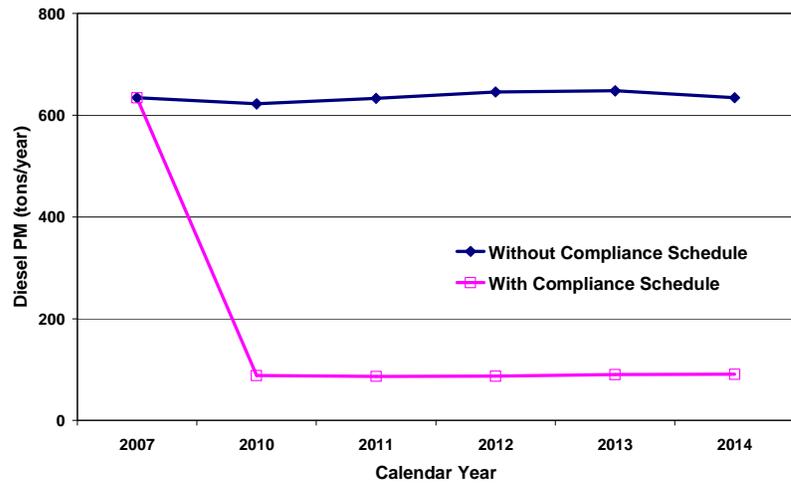
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Updated Emissions Benefits – South Coast NOx



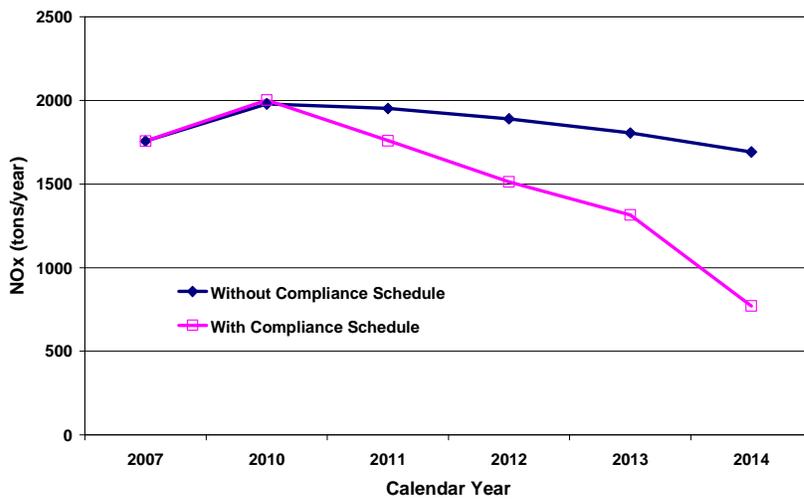
34

Updated Emissions Benefits – South Coast Diesel PM



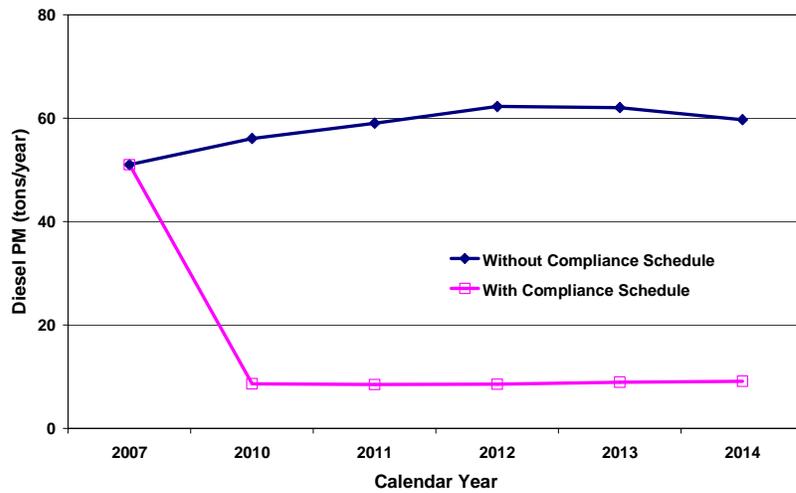
35

Updated Emissions Benefits – Bay Area NOx



36

Updated Emissions Benefits – Bay Area Diesel PM



37

Benefits from the Proposed Regulation

- 580 premature deaths
- 120 hospital admissions due to respiratory causes
- 230 hospital admissions due to cardiovascular causes
- 17,000 cases of asthma-related and other lower respiratory symptoms
- 1,400 cases of acute bronchitis
- 100,000 work loss days
- 580,000 minor restricted activity days



38

Economics - Costs of Regulatory Requirements

- Up to 32,000 trucks

Phase 1 Costs

- Pre-1994 truck replacement cost
 - \$21,000 (10 year old truck (1999 MY))
- Average DPF cost = \$10,000
 - Range \$7,500 - \$11,000 (350 - 450 hp)
 - Installations costs \$500 - \$1,000
- Annual DPF maintenance cost = \$300

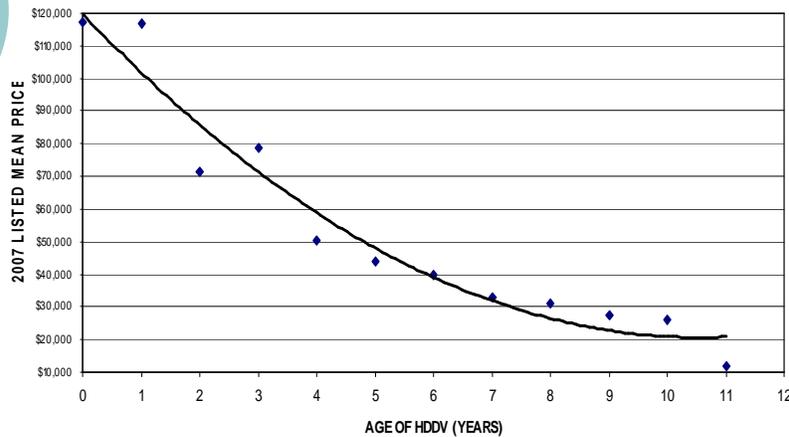


Phase 2 Costs

- 2007 MY compliant truck replacement cost
 - \$38,500 (6 year old truck)
 - Inflation adjusted cost ~ \$47,000 (2013)

39

Economics Cont. - Used Truck Price Model (July 2007 Market Survey)



40

Economics Cont. - Other Costs

- Labor compliance costs
(i.e., recordkeeping and reporting) = \$250 / year
- High credit risk costs
15 percent on truck loan interest rate
- Pre-2004 truck trade-in loss
(up to 50 percent of residual value)



41

Economics Cont. - Total Compliance Costs

- \$50,000-\$70,000 per drayage truck
 - Range reflects upgrade to 1994 or newer truck
 - Economic loss from disposal of older vehicle included
 - Annual maintenance and recordkeeping costs not included
 - Incentives and grants not included

42

Economics Cont. - Economic Costs

- Total cost = \$1.1 - \$1.5 billion
- Annualized costs
 - \$3,800 per truck (Phase 1: 2009 - 2012)
 - \$5,900 per truck (Phase 2: 2013 - 2027)
- Cost-effectiveness
 - PM = \$57 - \$77 / pound
 - NOx = \$6 - \$8 / pound



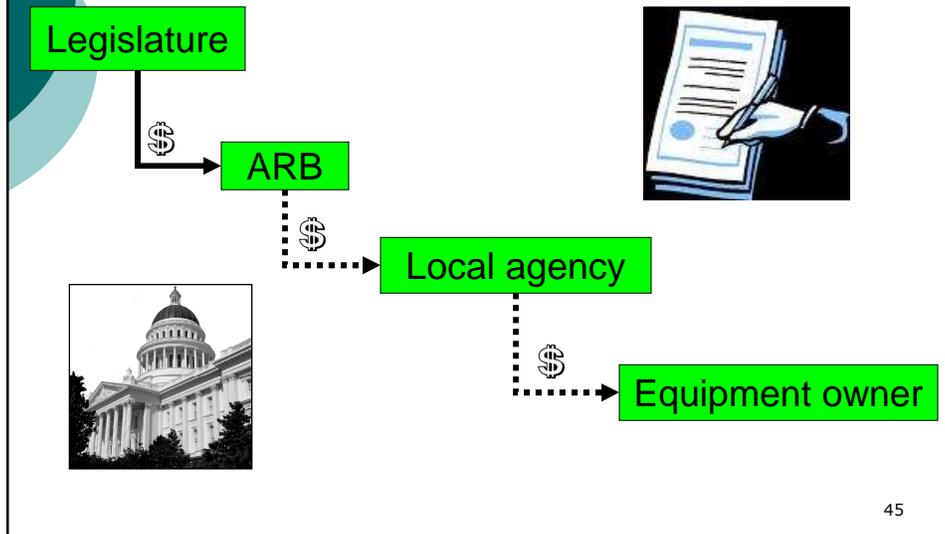
43

Potential Funding Source - 1B Bond

- ARB awards competitive grants to local agencies to fund cleaner equipment along CA trade corridors
 - Local agencies run competitive programs
 - Proposed \$400 million for drayage trucks
- \$250 million budget appropriation for 07-08:
 - Priority for projects with quick implementation, DPFs

44

Potential Funding Source - 1B Bond - Cont. Funding Diagram



Potential Funding Source - 1B Bond - Cont.

- Option 1: Truck retrofit
 - \$5,000 / truck for a verified Level 3 soot filter to retrofit pre-model year 2007 diesel trucks
- Option 2: Truck replacement
 - \$20-50K / truck to replace 2003 and older diesel trucks with trucks meeting MY2007 emission levels or better.
- More info:
<http://arb/ca/gov/gmbond>
- Goods movement
Information Line at:
(916) 444-6637



46

Contact Information – Emission Inventory

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 - Regulatory Support Section/Mobile Sources Analysis Branch
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 - (916) 323-2915 / mbenjami@arb.ca.gov
 - Mobile Sources Analysis Branch

47

Action Items Future Meetings / Contact Info

- **Staff report including draft regulation – Released October 19th**
- **Board consideration – December 6-7, 2007**
- **Future public workshops:**
 - **November 1, 2007 (Port of Oakland)**
- **Regulation contact information:**
 - Michael Miguel, Manager**
 - Phone: (916) 445-4236**
 - email: mmiguel@arb.ca.gov**



Website:

<http://www.arb.ca.gov/msprog/onroad/porttruck/porttruck.htm>

48

Discussion



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California Environmental Protection Agency

