

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
July 2007**





Agenda

- Introductions
- Need for Emissions Reductions
- Draft Regulation Concept
- Implementation Concept
- Emissions Inventory
- Important Dates/Contact Information
- Discussion

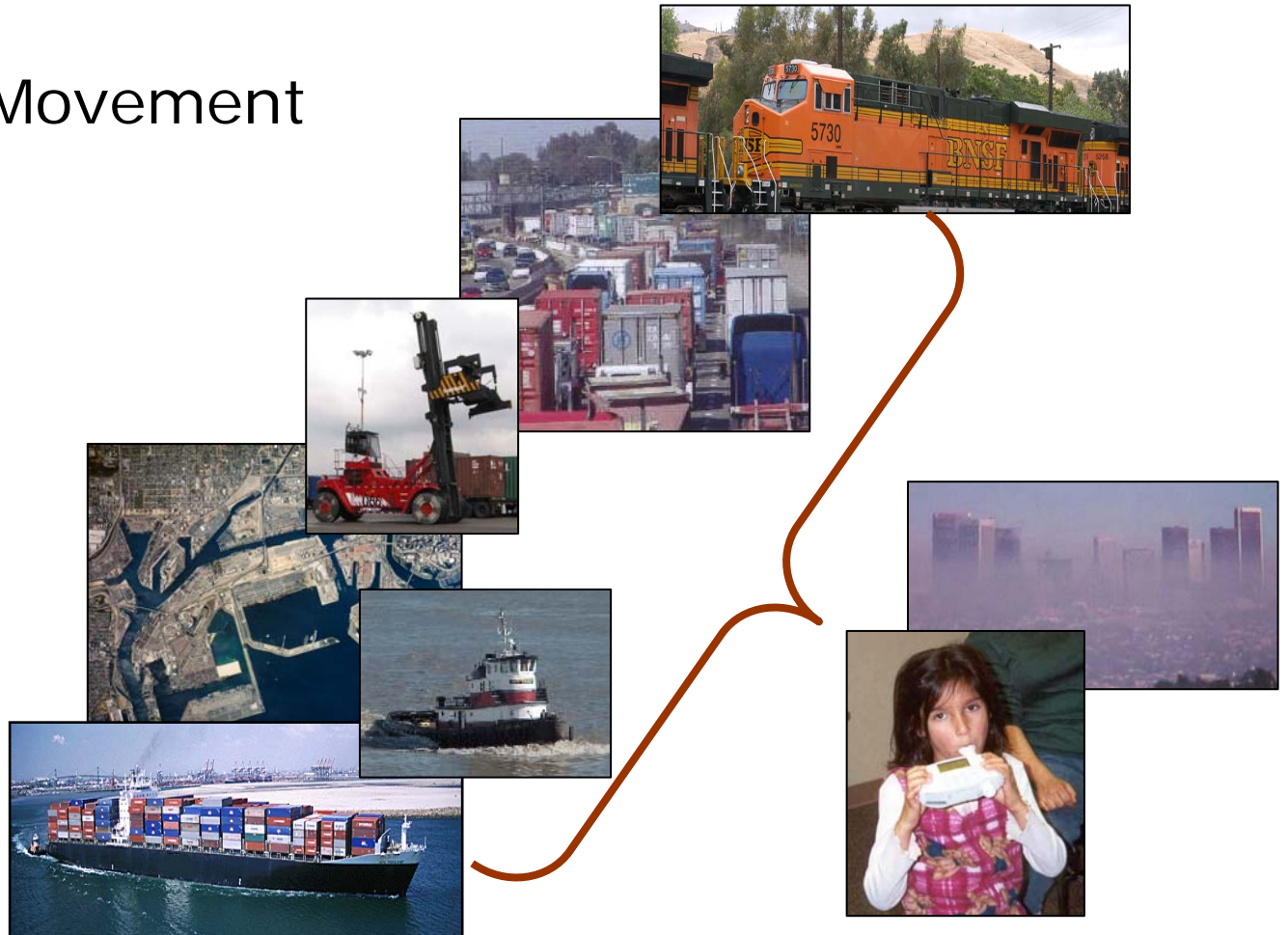


ARB Outreach Efforts

- Initial staff report – April 2006
- Public consultation meetings
- Meetings with trade associations, interest groups, & stakeholders
- Local community groups
- Drayage trucker meetings
- Air Districts
- Port and rail yard site visits
- Surveys and flyers
- Regulatory development workshops

Need for Emission Reductions

Goods Movement





Need for Emission Reductions

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



Air Pollution Reduction Regulations

- Diesel Risk Reduction Plan:
 - 75% reduction in PM by 2010
 - 85% reduction in PM by 2020
- Goods Movement Action Plan
- State Implementation Plan
- Federal Clean Air Act:
 - Must attain ozone and PM standards

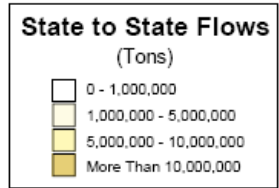
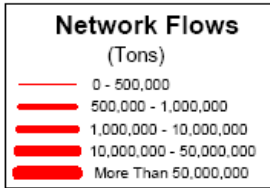
Commodity Flows - Trucks




 U.S. Department of Transportation
 Federal Highway Administration
 Office of Freight Management and Operations
 Freight Analysis Framework

Total Combined Truck Flows
(1998)

CALIFORNIA



Commodity Flows - Rail



Statewide NO_x and PM - Heavy Heavy Duty Trucks (Class 8)

- HHDT Represent:
 - ~30% of Statewide PM
 - ~25% of Statewide NO_x
- Without additional regulations, in 2014, pre-2004 trucks will represent 40% of NO_x and 50% of PM emissions of HHDT operating in California.

Population of Heavy-Duty Drayage Trucks

	Number of trucks
Ports of LA* and LB**	10,500
Port of Oakland	2,800
Rest of ports	1,000
Intermodal rail yards	3,600
Total number of trucks in drayage service	17,900

* LA: Los Angeles

**LB: Long Beach

2007 Baseline Emissions – Drayage Trucks

	PM Emissions (tons/year)	NOx Emissions (tons/year)
Ports and Intermodal Rail yards*	330	7,450

*Drayage Fleet Total of ~50,000 trucks

Which Ports and Intermodal Rail yards

CA Ports: 14-total	Benicia, Crockett, Hueneme, Humboldt Bay, Long Beach, Los Angeles, Oakland, Pittsburgh, Redwood City, Richmond, Sacramento, San Diego, San Francisco, and Stockton
Intermodal Rail yards: 11-total	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

Applicability / Exemptions

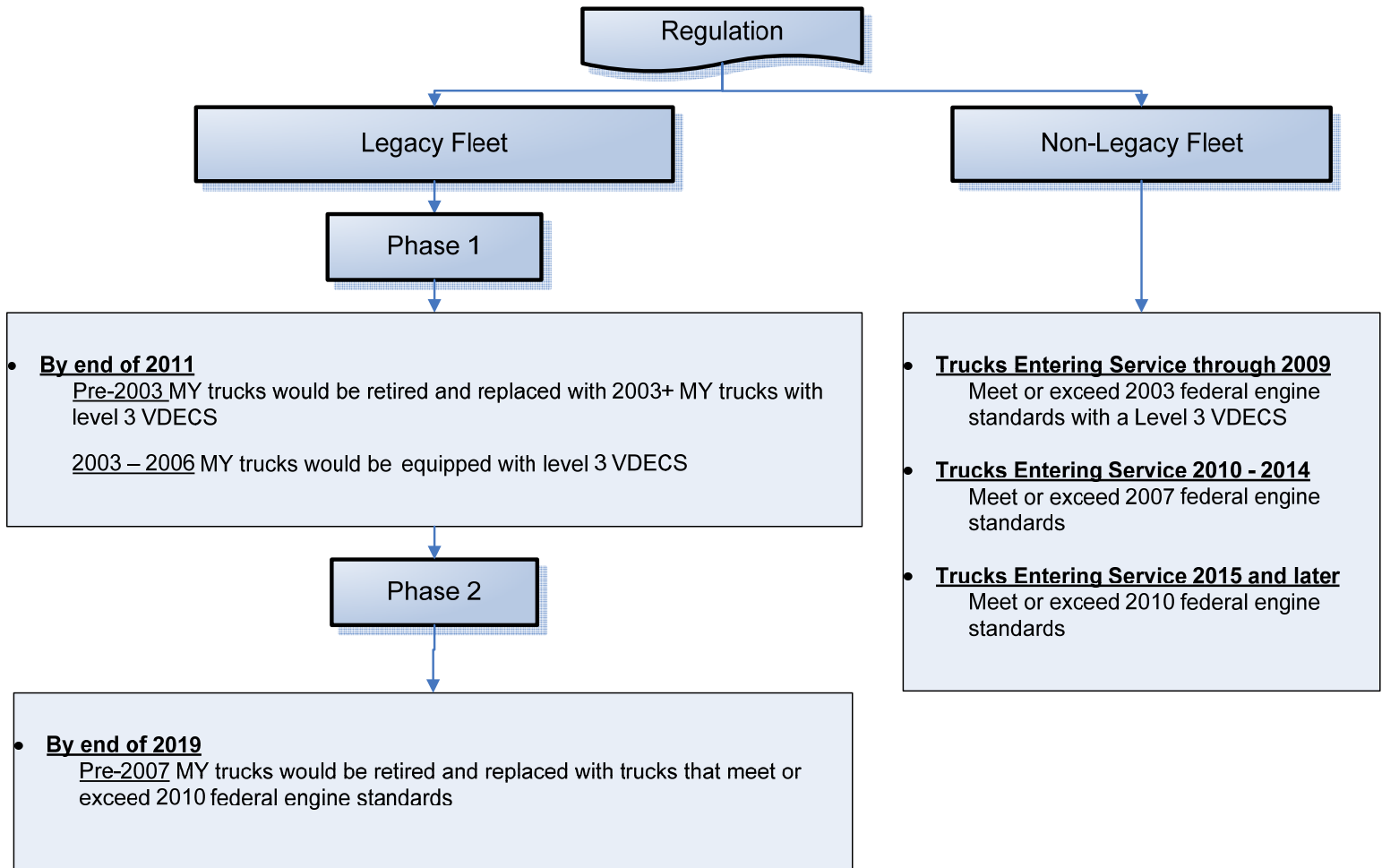
○ Applies to:

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

○ Exemptions:

- Specialized use vehicles
- Emergency vehicles
- Military
- 'Small' ports

Compliance Schedule – Major Milestones



Compliance Schedule - Phase 1

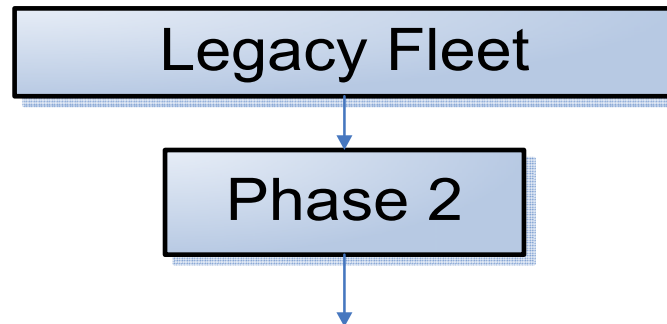
Legacy Fleet

Phase 1

By end of 2011

- Pre-2003 MY trucks would be retired and replaced with 2003+ MY trucks with level 3 VDECS
- 2003 – 2006 MY trucks would be equipped with level 3 VDECS

Compliance Schedule - Phase 2



- **By end of 2019**

Pre-2007 MY trucks would be retired and replaced with trucks that meet or exceed 2010 federal engine standards

Compliance Schedule - Non-Legacy Trucks

Non-Legacy Trucks

- **Trucks Entering Service through 2009**
Meet or exceed 2003 federal engine standards with a level 3 VDECS
- **Trucks Entering Service 2010 - 2014**
Meet or exceed 2007 federal engine standards
- **Trucks Entering Service 2015 and later**
Meet or exceed 2010 federal engine standards

Truck Registry

- Drayage Truck Registry (DTR):
 - Help ensures compliance
- Register:
 - Prior to Jan. 1, 2009 - Legacy
 - After Jan. 1, 2009 - Non-Legacy
- 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)
- Fines for non-compliance

Implementation: Truck Owner

- Truck owner responsibilities:
 - Register with the Drayage Truck Registry
 - Affix compliance sticker on truck
 - Ensure truck meets requirements of regulation
 - Maintain emission control device
 - Keep maintenance log
 - Fines issued for non-compliance
- Possible one-time extension

Strategies to Reduce Truck Emissions

- Retrofit technologies:
 - Must be ARB verified
 - Hardware diesel emission control strategies:
 - Diesel particulate filters (DPF)
 - Level 3 (85% reduction)
- Truck MY 2003 + DPF:
 - 2003 Federal engine standards
 - Must install ARB certified diesel PM filter

Implementation: Motor Carrier

- Motor carrier responsibilities:
 - Informing truck owners:
 - Regulatory provisions
 - Compliance deadlines
 - Truck owner requirements and penalties
 - Ensure trucks are in compliance with regulation before dispatching to the port or rail yard (DTR, Emission Standards etc.)
 - Bill of lading info requirement
 - Fines for dispatching non-compliant trucks



Implementation: Marine Terminals & Rail yards

- Marine terminals & rail yards responsibilities:
 - Deny entry for trucks not in compliance with regulation (DTR sticker)

Enforcement Responsibilities

- Enforcement entities:
 - Air Resources Board—primary
 - Law enforcement and local Air Districts—secondary
 - Port and rail yard authorities



ARB Enforcement

- Field inspections:
 - Compliance with regulation
 - Proper installation and operation of emission control devices
 - Emission control device maintenance records
 - Terminal operators – only allow properly DTR stickered trucks
- Primary motor carrier audits



Emissions Inventory Discussion



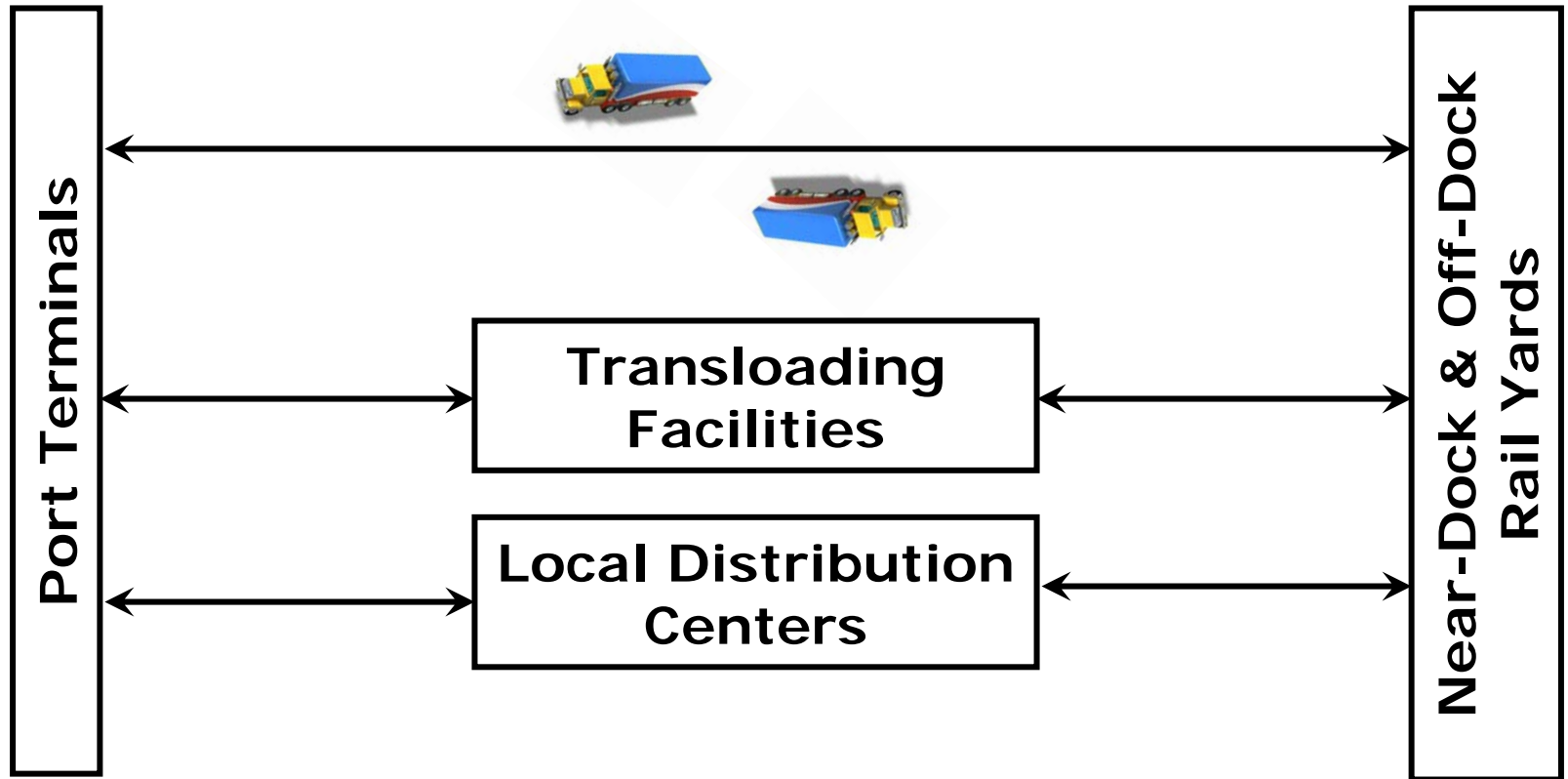
Overview

- Emissions Inventory Development
 - Heavy heavy-duty diesel trucks operating at California's ports and intermodal rail yards
- Regulatory Benefits
 - Statewide
 - South Coast
 - Bay Area
 - San Diego

Emissions Inventory Status

- Developing model to estimate travel activity and emissions
- Model based upon
 - Published reports/studies
 - Data provided to ARB by ports and rail yards
 - ARB surveys
- Work in progress
 - On-going refinement with stakeholders
 - Updating with new information and data
- Proposed emissions inventory
 - Based on container movements
 - Port/Rail yard specific modeling in South Coast and Bay Area
 - Port of Oakland emissions scaled to smaller ports

Example of Container Flow



Emissions Inventory Development Process

$$EM = \sum \text{TripNum} \times \text{TripDist} \times \text{EmRate} \times \text{FutGrth}$$

Where, EM = emissions (tons/yr)

TripNum = number of trips

TripDist = travel distance (mi)

EmRate = emissions rate (g/mi)

FutGrth = future growth

Number of Trips

- Estimated using container moves at ports / rail yards
 - Assume 1.8 TEU per container
 - Estimate trip fractions to each facility type
 - Rail yards, distribution centers, etc.
- Assumed additional 30% of trips are bobtails/chasses
 - Truck traffic survey at major southern California freeways (ARB, 2007)
 - Interview of southern California fleet owners (ARB, 2006)
 - Rail yard health risk assessments (ARB, 2007)

Travel Distance per Trip

- Ports of LA/LB
 - Rail yards: measured distance
 - Transloading facilities and local distribution centers: port truck travel demand model for South Coast (Tioga Group, 2002)
- Port of Oakland
 - Railyards: measured distance
 - Transloading facilities and local distribution centers: measured distance based on Bay Area goods movement study (Cambridge Systematics, 2003)

Estimated Travel Distance (Miles)

Destination from Ports	Ports of LA / LB	Port of Oakland
Near-Dock Rail yards	5	1.5
Off-Dock Rail yards	26	N/A
Transloading Facilities	15	15
Local Distribution Centers	30	31
Regional Distribution Centers	N/A***	80* 100**

* To Modesto and Sacramento, CA

** To Salinas, CA

*** Combined to local distribution centers

Trips, Travel Miles, and VMT

Calendar Year 2007				
Ports*	Container Trips** (Millions)	Bobtail/ Chassis Trips (Millions)	Travel Miles	VMT (Millions)
LA / LB	7.4	3.8	19	213
Oakland	1.8	0.8	30	77
Calendar Year 2020				
LA / LB	12.9	7.7	19	394
Oakland	3.3	1.4	33	157

* Include rail yards

** Include street turn trips

Emissions Rate

- EMFAC2007
 - Baseline emissions rates and deterioration rates
 - Estimated life-time accrual
 - Port specific truck age distributions
 - Ports of Los Angeles and Long Beach
 - Port of Oakland



Future Growth

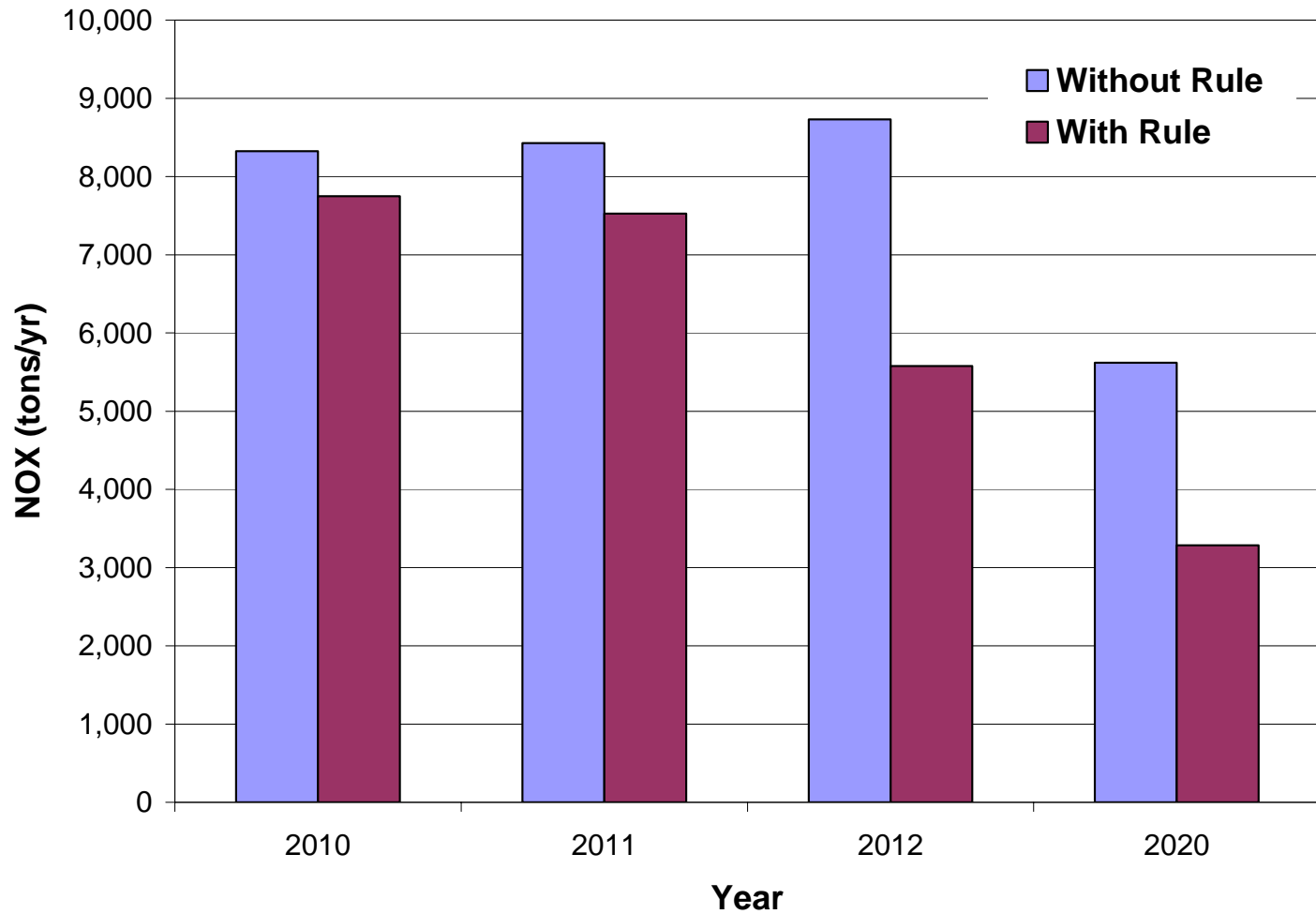
- Estimated growth in container throughput
 - Goods Movement Emissions Reduction Plan (ARB, 2006)
- Rail facility growth
- 5% annual growth rate

Drayage Truck Proposed Regulation

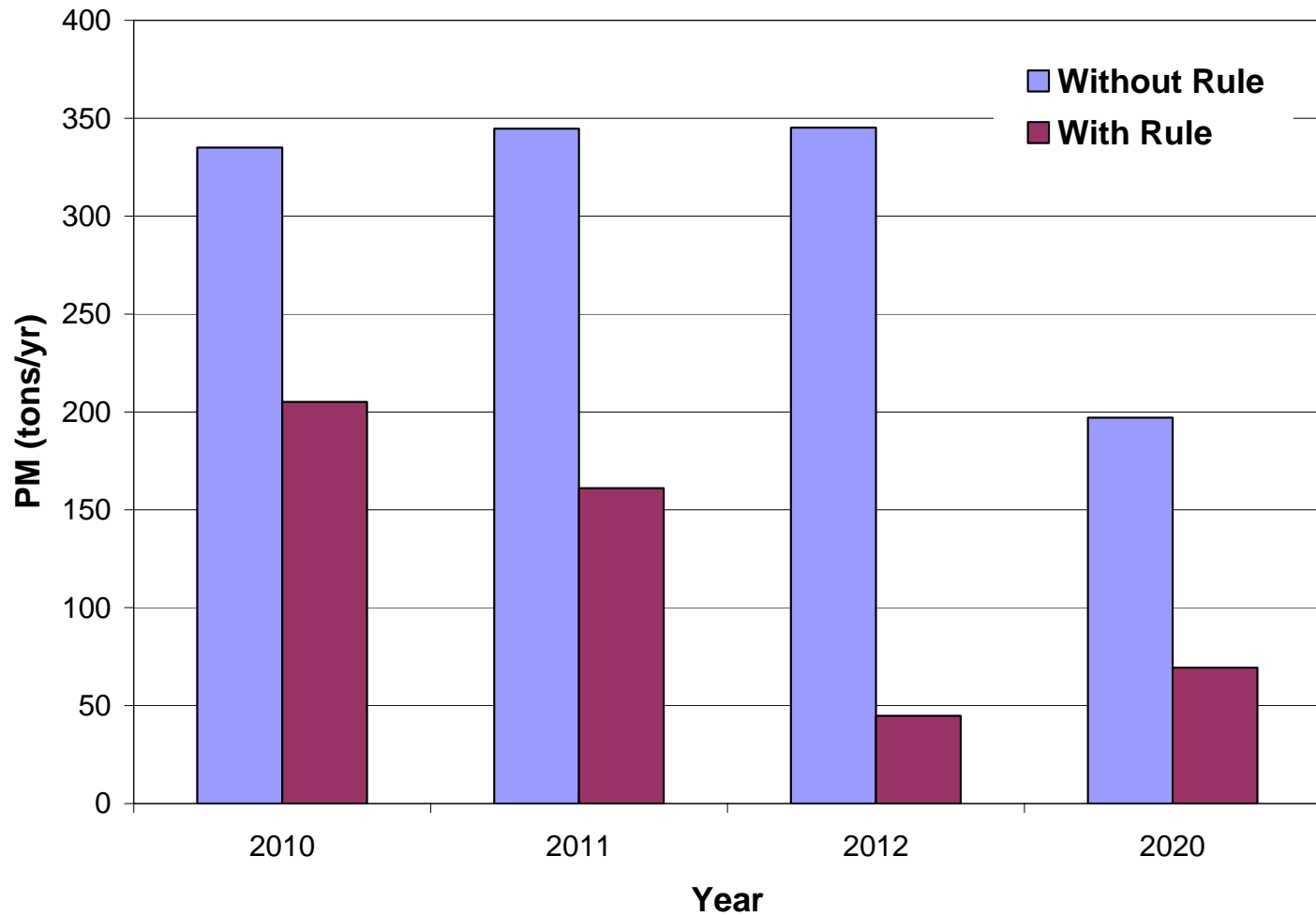
- Phase I (by 2012)
 - Replace pre-2003 model year engines with DPF
 - Retrofit 2003 to 2006 model year engines with DPF
- Phase II (by 2020)
 - Replace pre-2007 model year engines

Emissions Benefits

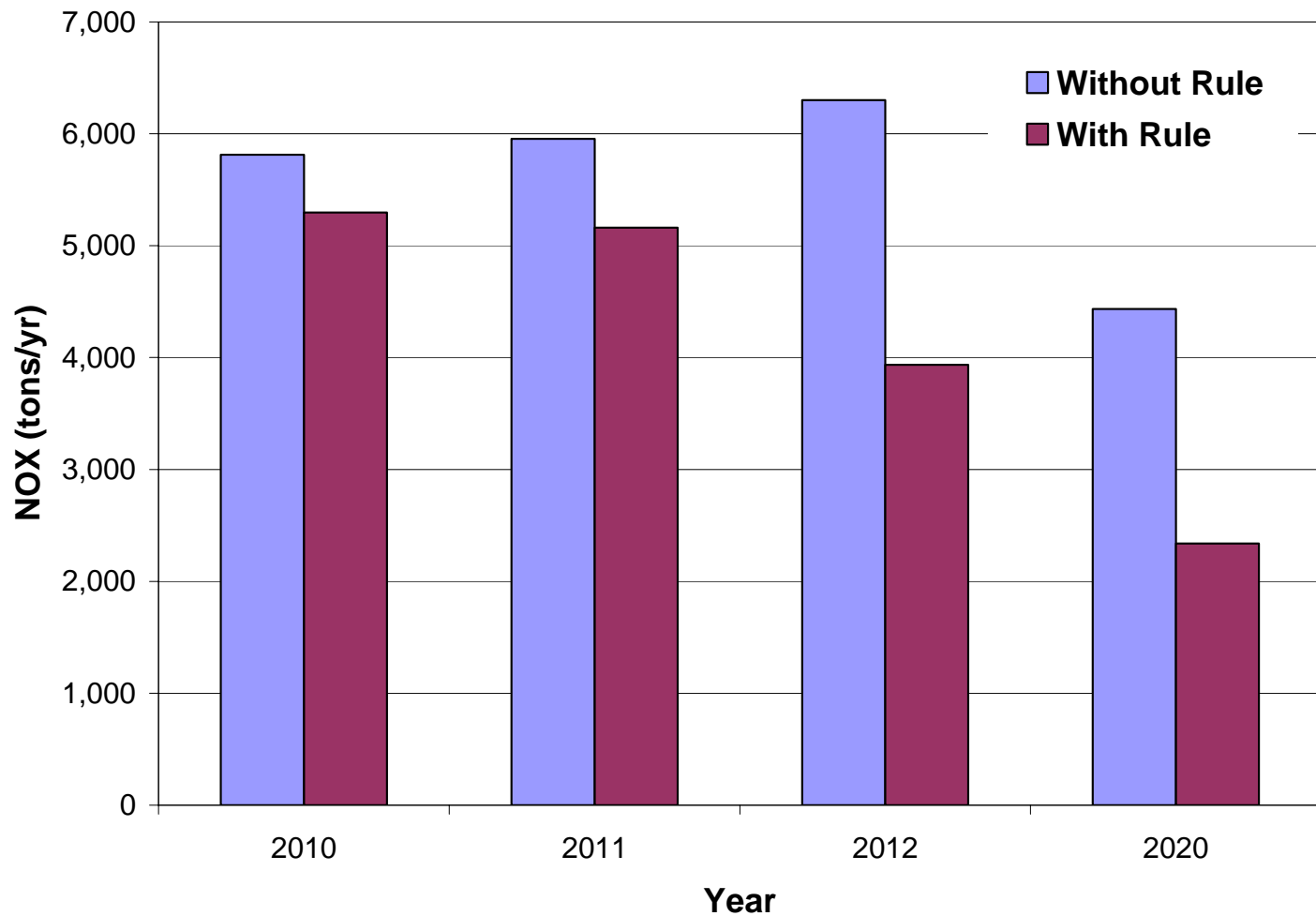
– Statewide NO_x



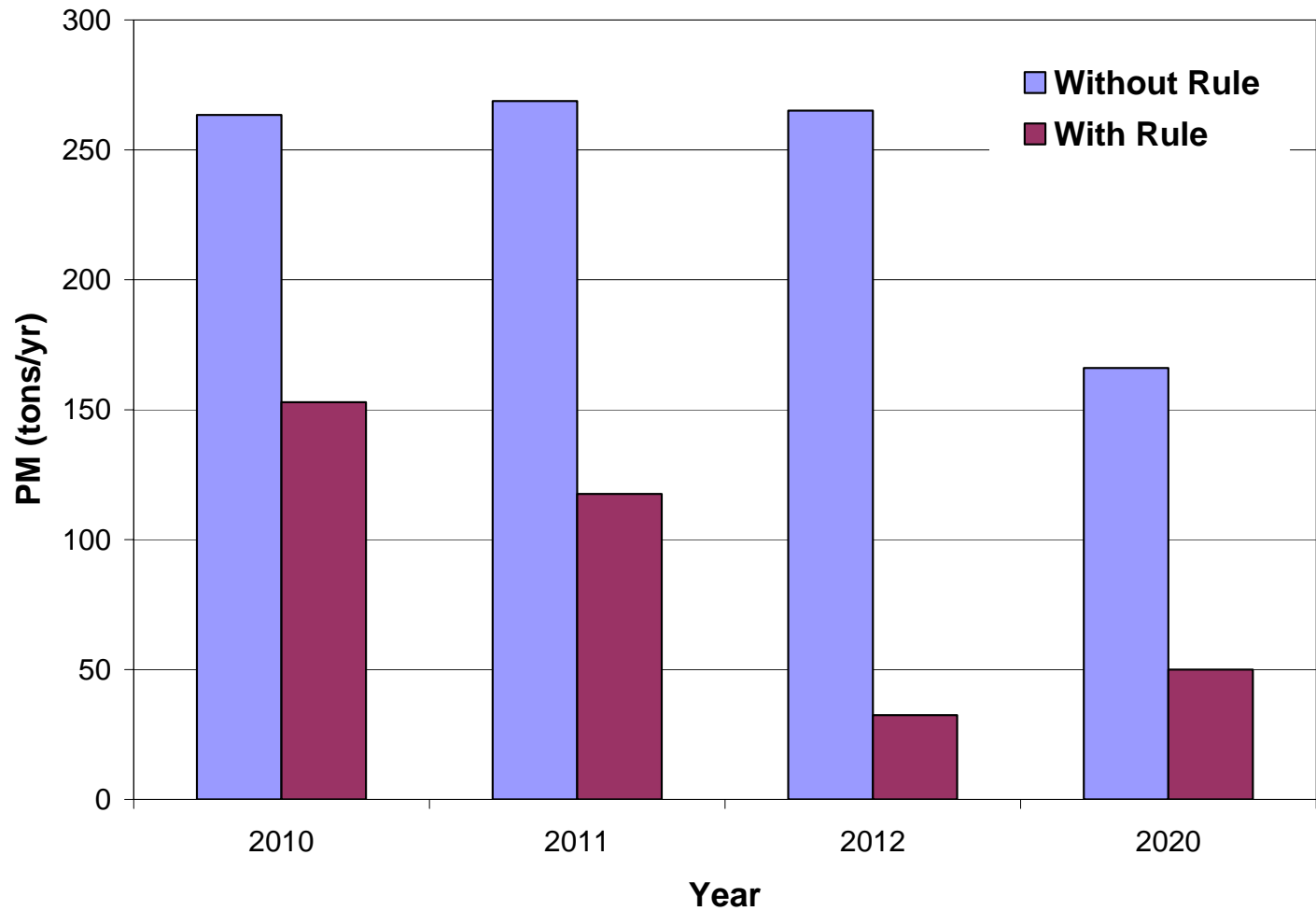
Emissions Benefits – Statewide PM



Emissions Benefits – South Coast NO_x

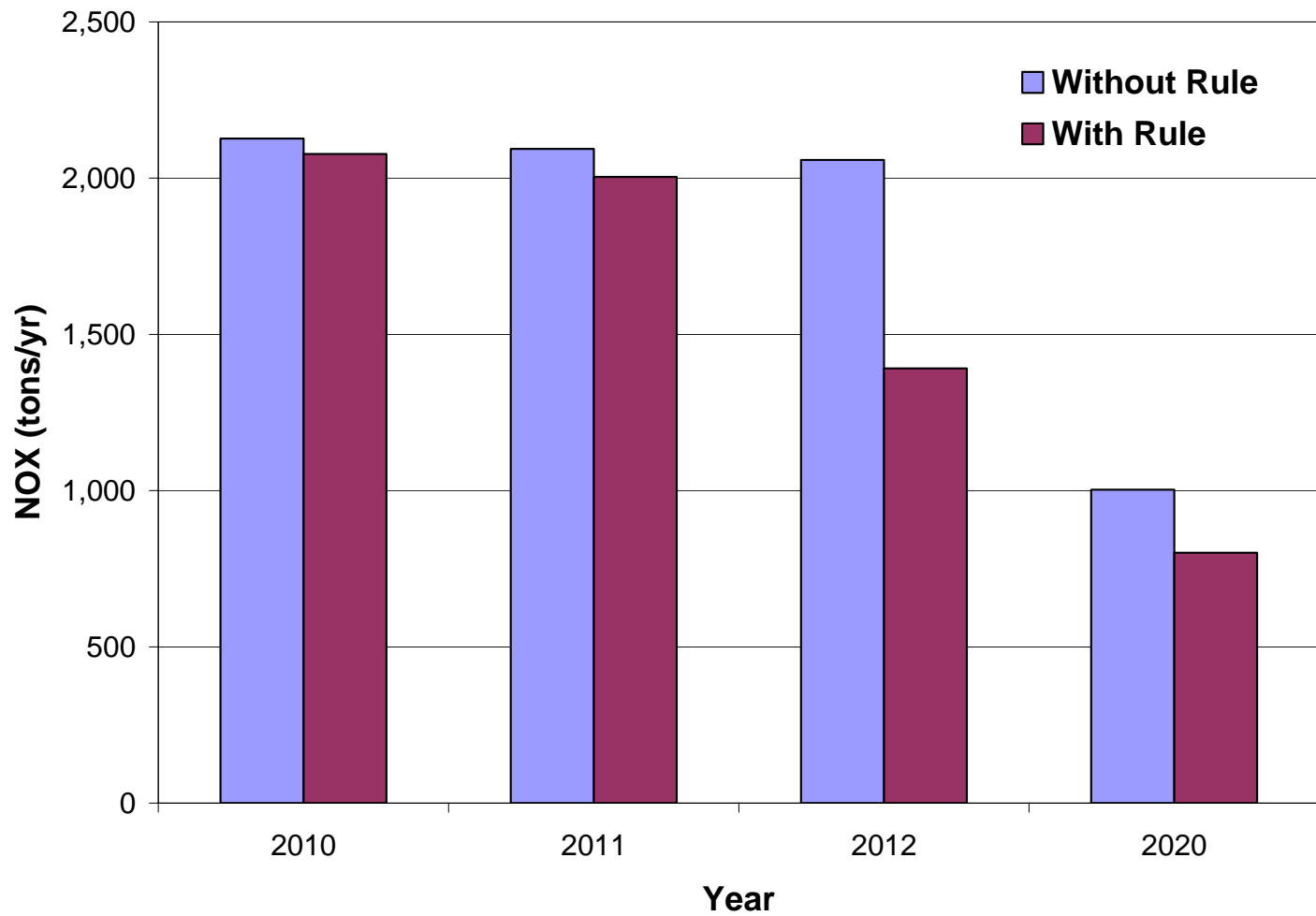


Emissions Benefits – South Coast PM

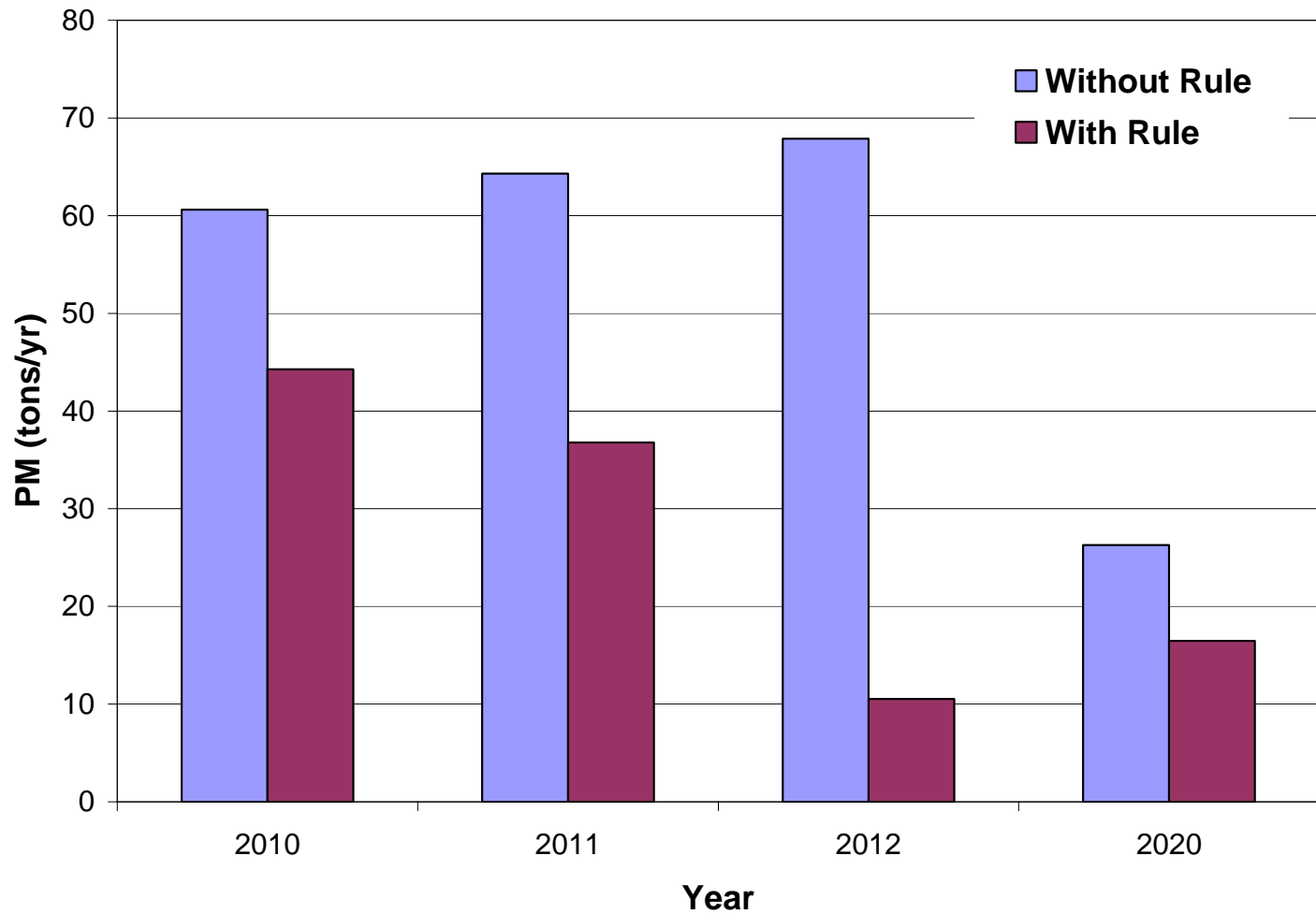


Emissions Benefits

– Bay Area NO_x

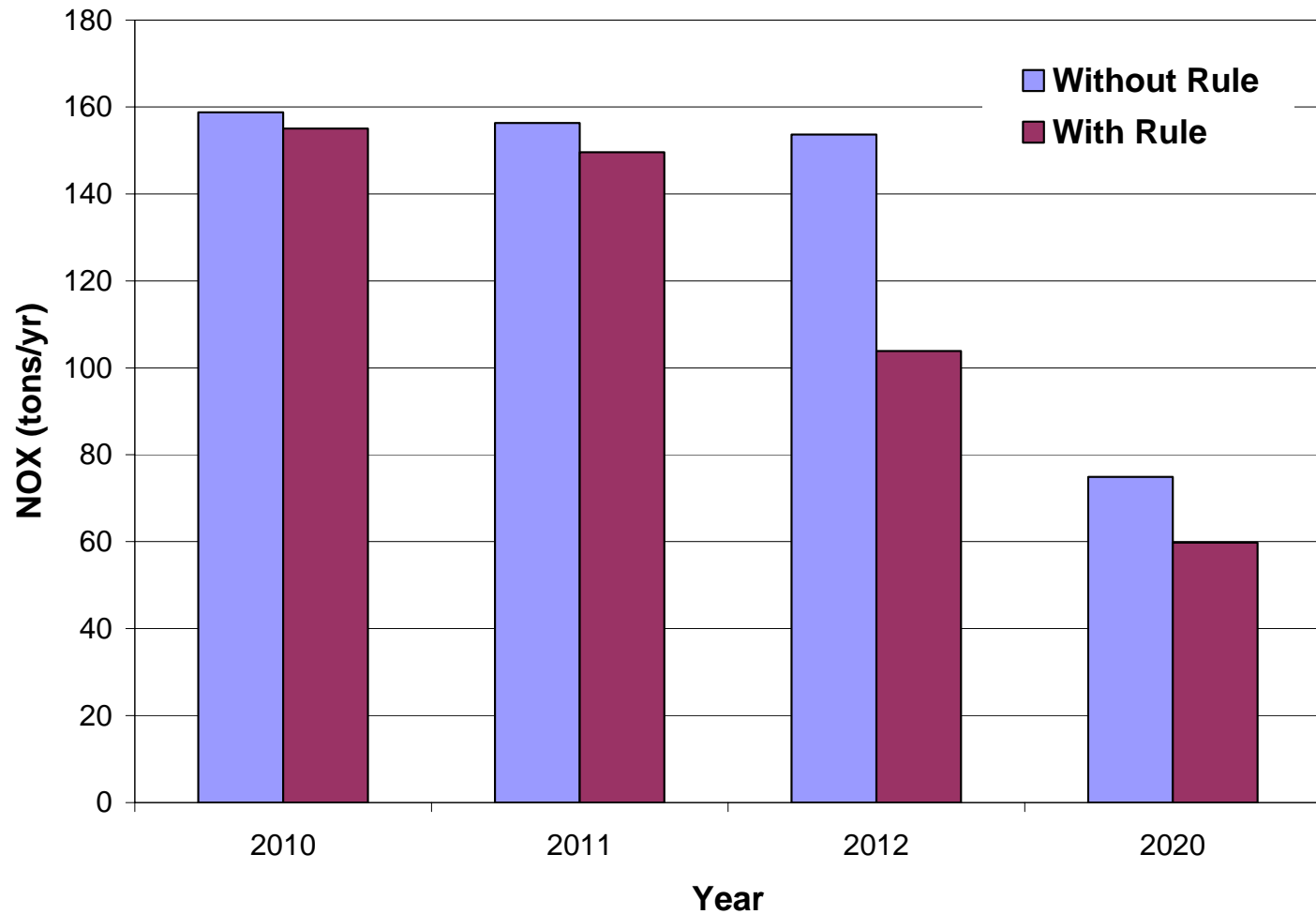


Emissions Benefits – Bay Area PM

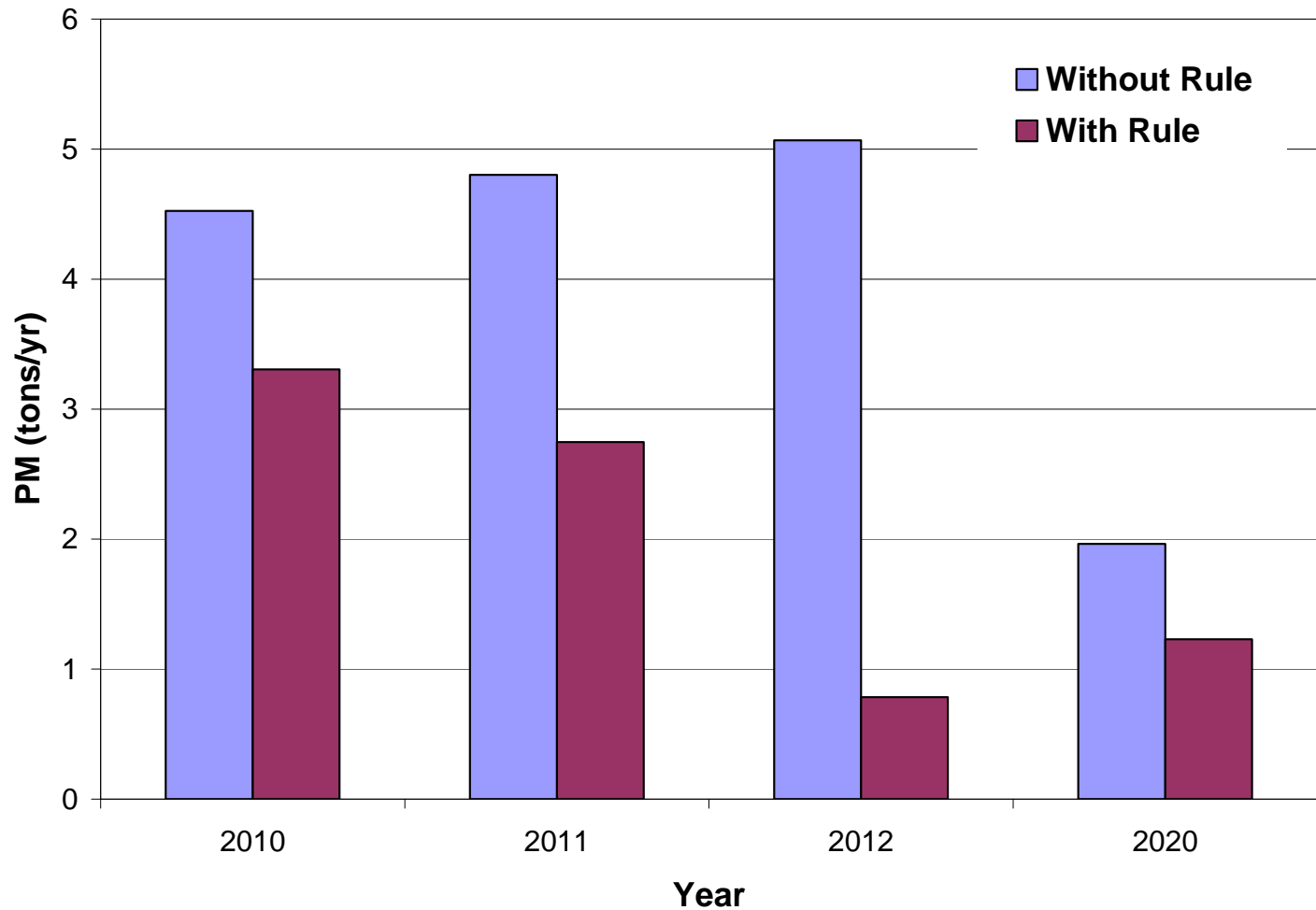


Emissions Benefits

– San Diego NO_x



Emissions Benefits – San Diego PM



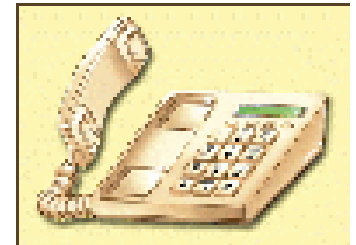
Contact Information

- **Seungju Yoon**
 - (916) 322-1718 / syoon@arb.ca.gov
 - Regulatory Support Section/Mobile Sources Analysis Branch
- **Todd Sax**, Manager
 - (916) 322-5474 / tsax@arb.ca.gov
 - Regulatory Support Section/Mobile Sources Analysis Branch
- **Michael Benjamin**, Chief
 - (916) 323-2915 / mbenjami@arb.ca.gov
 - Mobile Sources Analysis Branch

Action Items

Future Meetings/Contact Info

- Staff report including draft regulation – Sept. 2007
- Board consideration – November 2007
- Future public workshops:
 - To be determined
- 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>

Questions/Comments

