



Vessel Speed Reduction for Ocean-Going
Vessels Workshop
Sacramento
July 12, 2007

Air Resources Board
California Environmental Protection Agency



Overview

- Introduction
- Background
- Emission Inventory
- Current Efforts
- Regulatory/Voluntary Approaches
- Next Steps



Introduction

- Technical Assessment
 - Evaluation
 - Technical Report
- Potential Approach
 - Regulatory
 - Voluntary

3

Background

4

Air Pollution from Marine Vessels is a Public Health Concern

- Diesel PM identified in 1998 as a toxic air contaminant
 - Potential to Cause Cancer
- Non-Cancer Health Impacts of Diesel PM, SO_x, Ozone
 - Premature death
 - Respiratory disease
 - Cardiovascular disease
 - Activity restriction



5

Strategies for Reducing Emissions from Ships

- Diesel Risk Reduction Plan
- State Implementation Plan
- Environmental Justice Programs
- Goods Movement Action Plan
- Port Actions
- AB 32 - Greenhouse Gas Initiative

6

Specific Marine Regulations and Programs

- Auxiliary Engine Fuel Rule (2005)
- Onboard Incineration Prohibition (2005/2006)
- Proposed Shore-Power Rule (late 2007)
- Main Engine Fuel Rule (December 2007)
- Vessel Speed Reduction Measure (2008)
- Green Ships Programs (2008/2009)

7

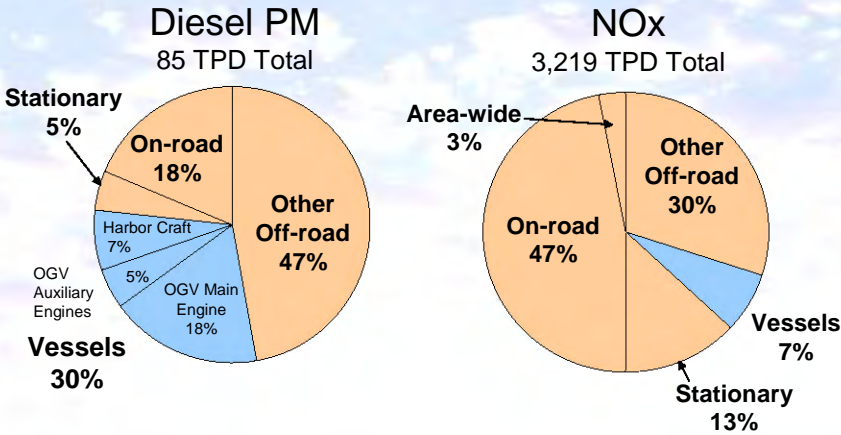
VSR Agreement

- 2001-2004 VSR Agreement
 - Voluntarily reduce speed to 12 knots within 20 nautical miles (nm) of the POLA and POLB
 - Estimated reductions of 1 ton per day of NOx
 - Estimated compliance rate of about 45 to 65 percent
- POLB Green Flag Program (2004)
 - Reduced dockage fees for compliance with VSR program
 - Current estimated compliance rate at POLB is about 80%
 - Estimated reductions of approximately 4-5 tons per day of NOx

8

Emission Inventory

Marine Vessels are a Large Source of California's NOx & Diesel PM Emissions*



* Source: 2005 ARB Emissions Inventory. Does not include benefit of ARB Ship Auxiliary Engine Regulation

2006 Port Calls

Port	# of Calls
LA/LB (LA approx. 40%)	5720
Oakland	1940
Carquinez	910
Richmond	760
San Diego	580
Hueneme	370
San Francisco	290
El Segundo	250
Stockton	170
Other	260

Source: CSLC, 2006. Numbers are rounded.

11

VSR Emissions Methodology

- Type and number of ships (container ship, passenger, etc.)
- Fuel used
- Difference in emissions at cruise speed and 12 knots
- Distance traveled within VSR zone

12

Preliminary VSR Emissions Reductions at 12 knots for POLA*

Pollutants	% Reduction	Tons Per Day
NOx	37	3
SOx	49	2
Diesel PM	49	0.3
CO ₂	31	90
CO	37	0.2

*2006, all ship types. Assumes speed of 12 knots at 24 nm with main engines using HFO & auxiliary engines using MDO/MGO.

13

Technical Assessment

- Evaluate emissions and reduction benefits of VSR at 12 knots from 24 nautical miles
- Look at impact at 40 and 100 nautical miles
- Look at impact along California coast
- Evaluate cost impacts

14

Current Efforts

- Emissions
 - Updating emissions inventory at various distances (i.e., 24 nm, 40 nm, 100 nm) and at different speeds
 - Emission factor verification
- Exposure
 - Onshore transport
 - Health risk evaluation to near shore communities
- Effectiveness
 - Emission and risk reduction benefits
 - Cost
 - Continue evaluating VSR voluntary programs

15

Regulatory/Voluntary Approaches

16

Regulatory/Voluntary Approaches

- Regulatory
 - Statewide VSR Airborne Toxic Control Measure (ATCM)
 - Port specific VSR ATCM
 - Consideration of speed reduction when transiting along the coast
- Voluntary
 - Statewide agreement
 - Port specific agreement
 - Lease specific agreement
 - Incentive programs

17

Key Elements

- Emissions Inventory
- Cost Impacts
- Other Impacts

18



Next Steps

19



Next Steps

- Work with stakeholders to address key elements
- Release draft Technical Assessment Report for comment (late 2007)
- 2nd workshop (TBD)

20

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<http://www.arb.ca.gov/ports/marinevess/vsr/vsr.htm>

21