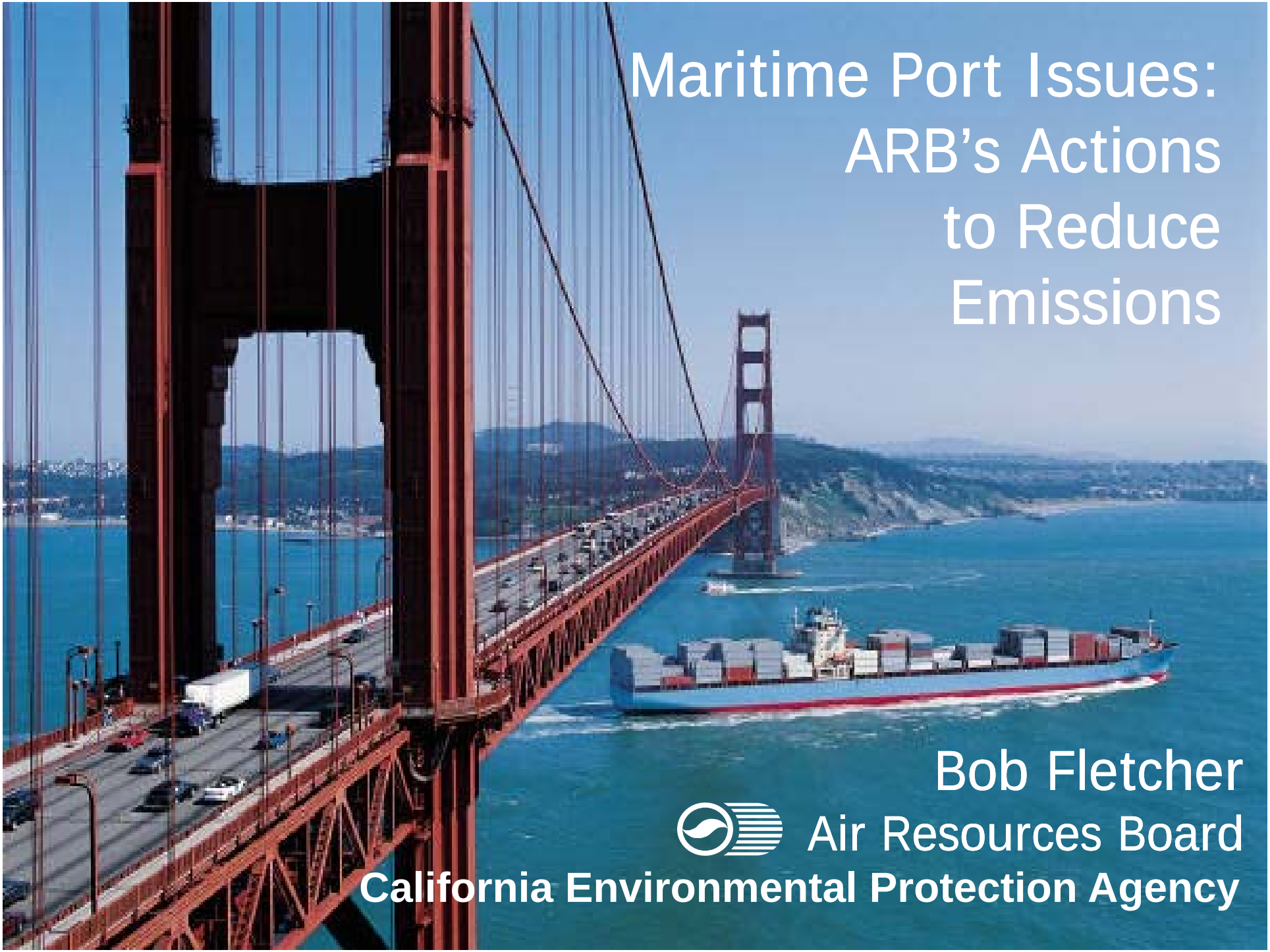


Maritime Port Issues: ARB's Actions to Reduce Emissions

Bob Fletcher

Air Resources Board

California Environmental Protection Agency

Overview

- Scope of Emissions from Goods Movement
- Risk near Ports
- Strategies to Reduce Emissions
- Summary

Across California

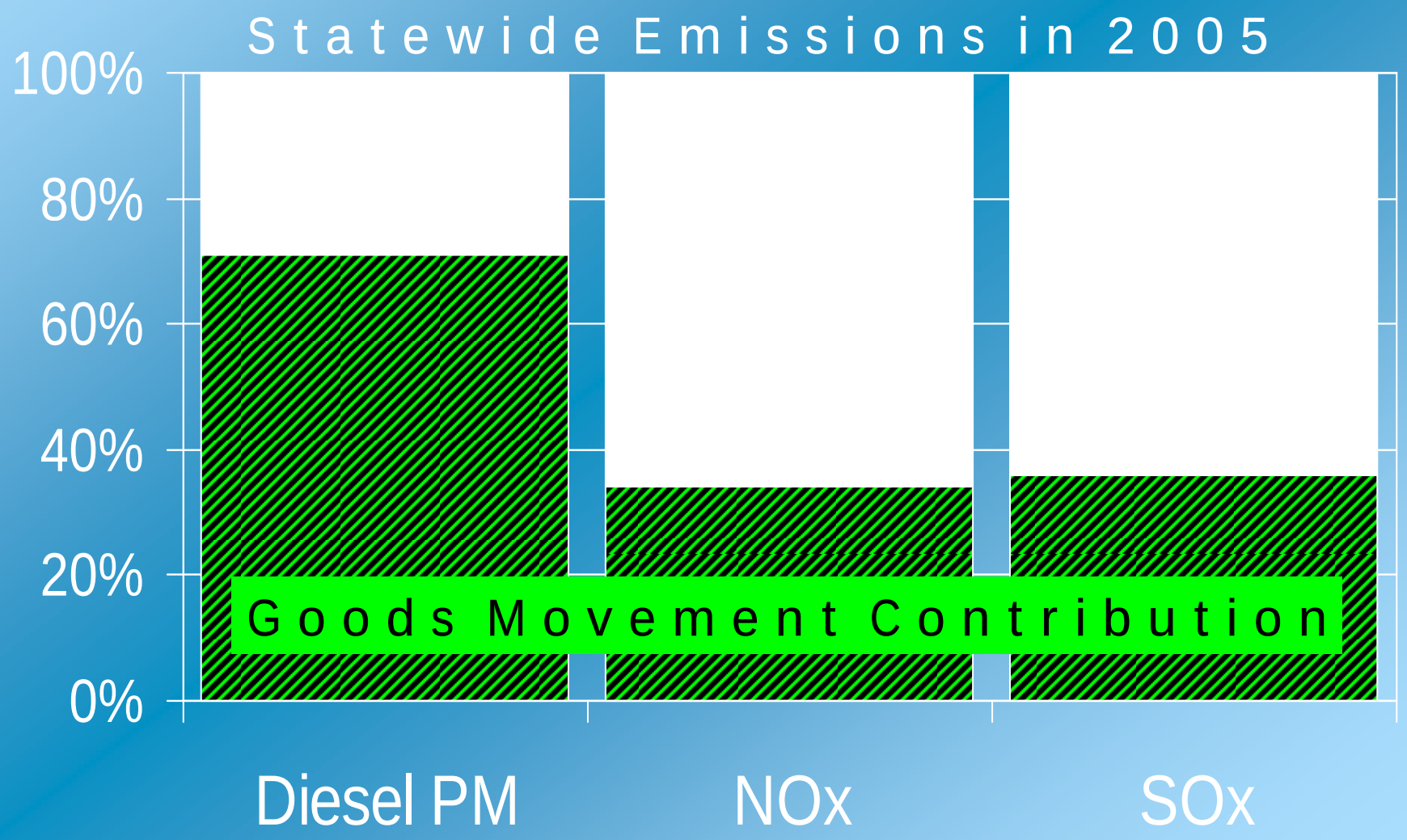
A typical day for goods movement:

- 30,000 containers on ships
- 400,000+ big diesel trucks
- 1,200 locomotives

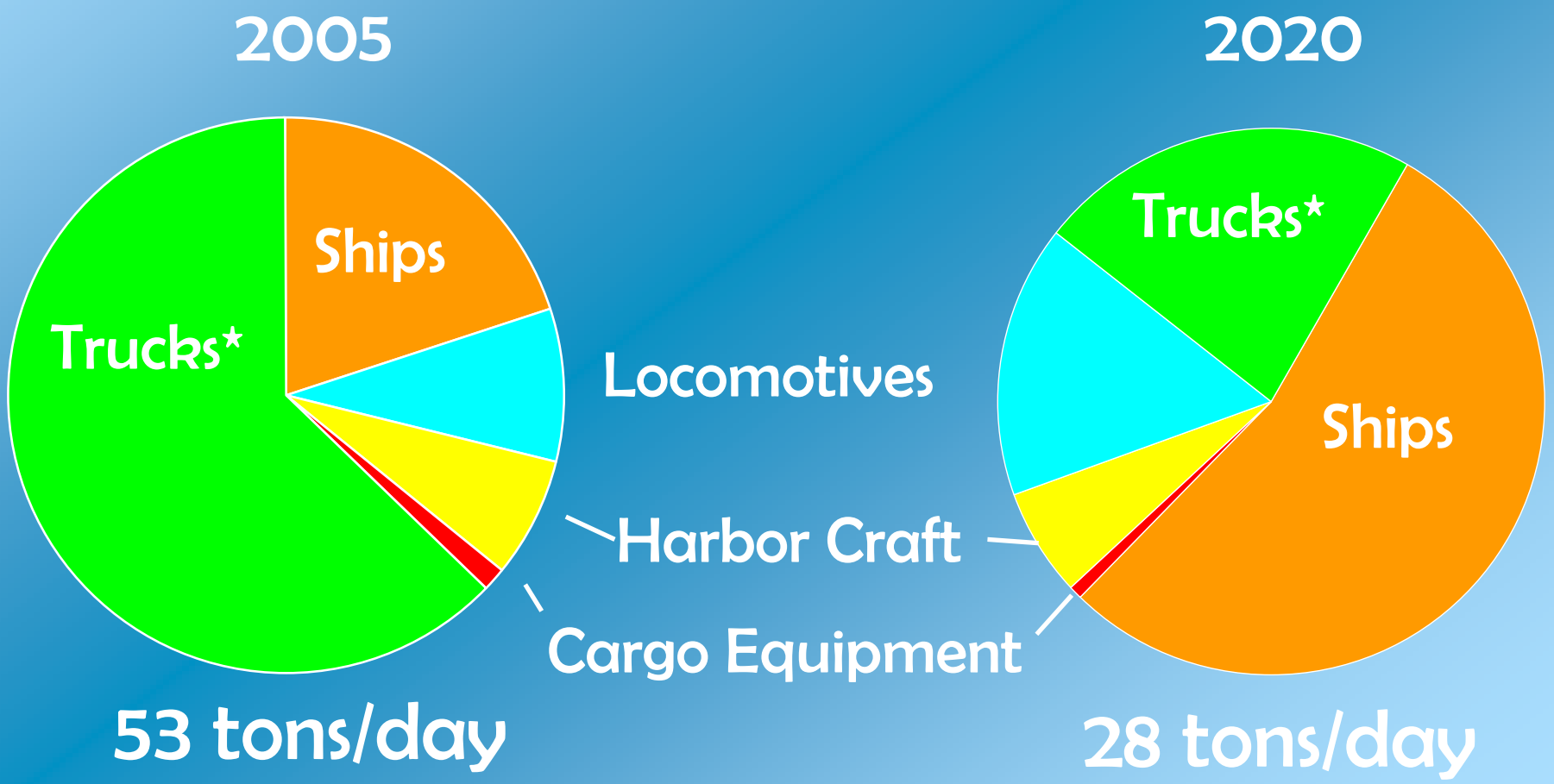
Supported by:

- 3,700 pieces diesel cargo equipment
- 4,100 commercial harbor craft

Emissions Contribution in 2005

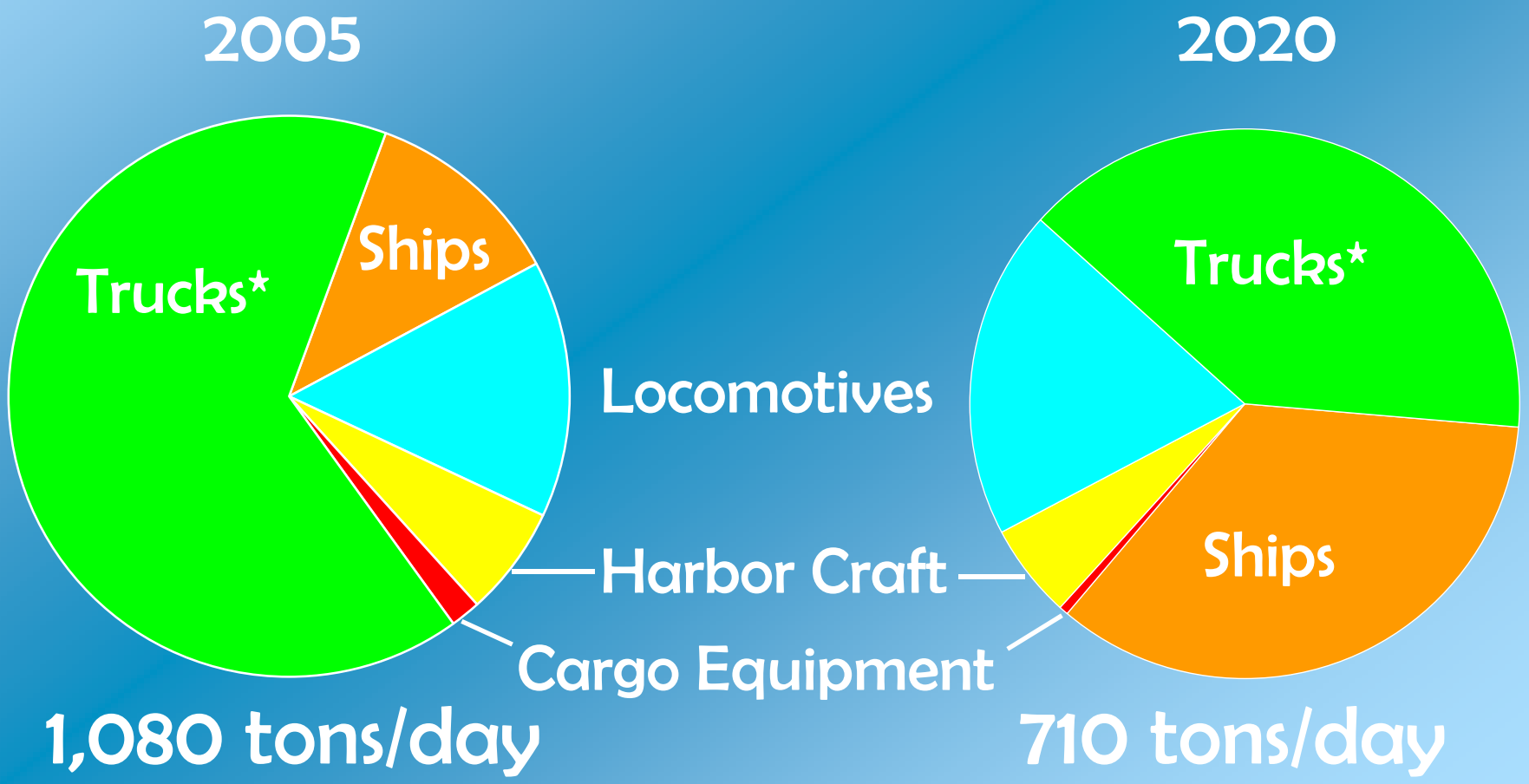


Diesel PM from Goods Movement



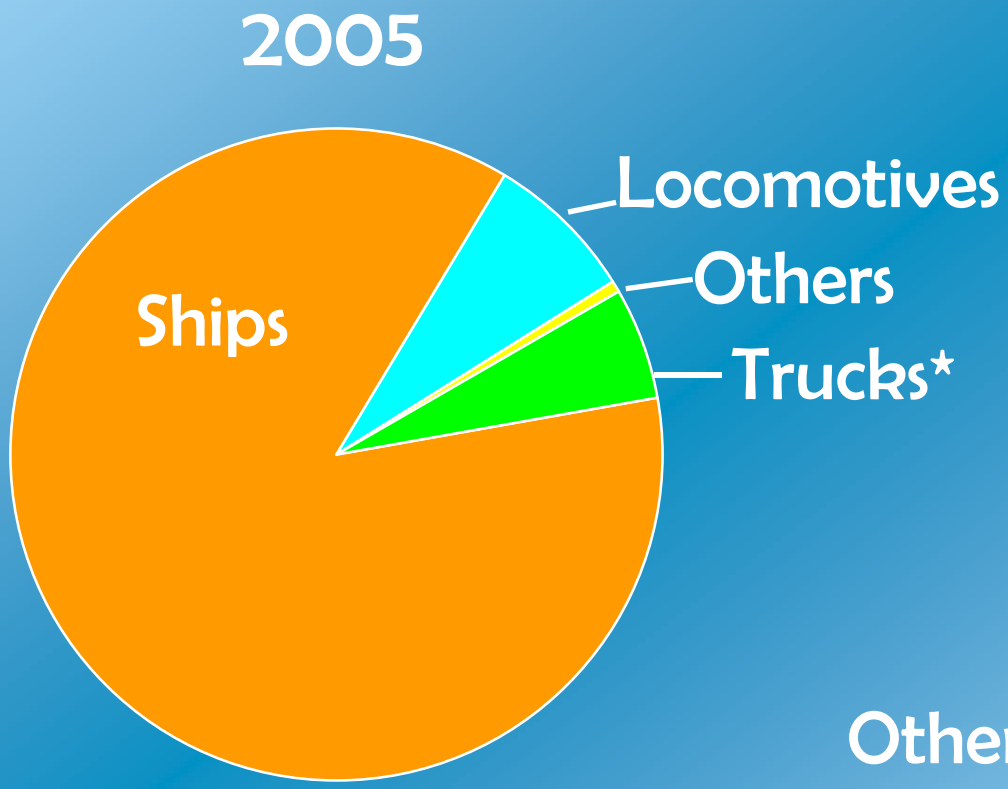
* Includes TRUs

NOx from Goods Movement

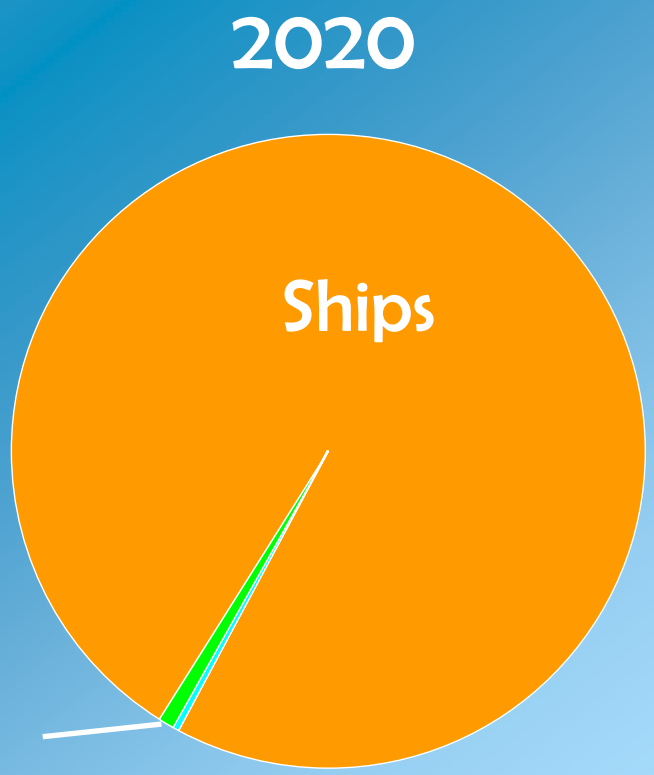


* Includes TRUs

SOx from Goods Movement



90 tons/day



105 tons/day

* Includes TRUs

Assessing the Risk

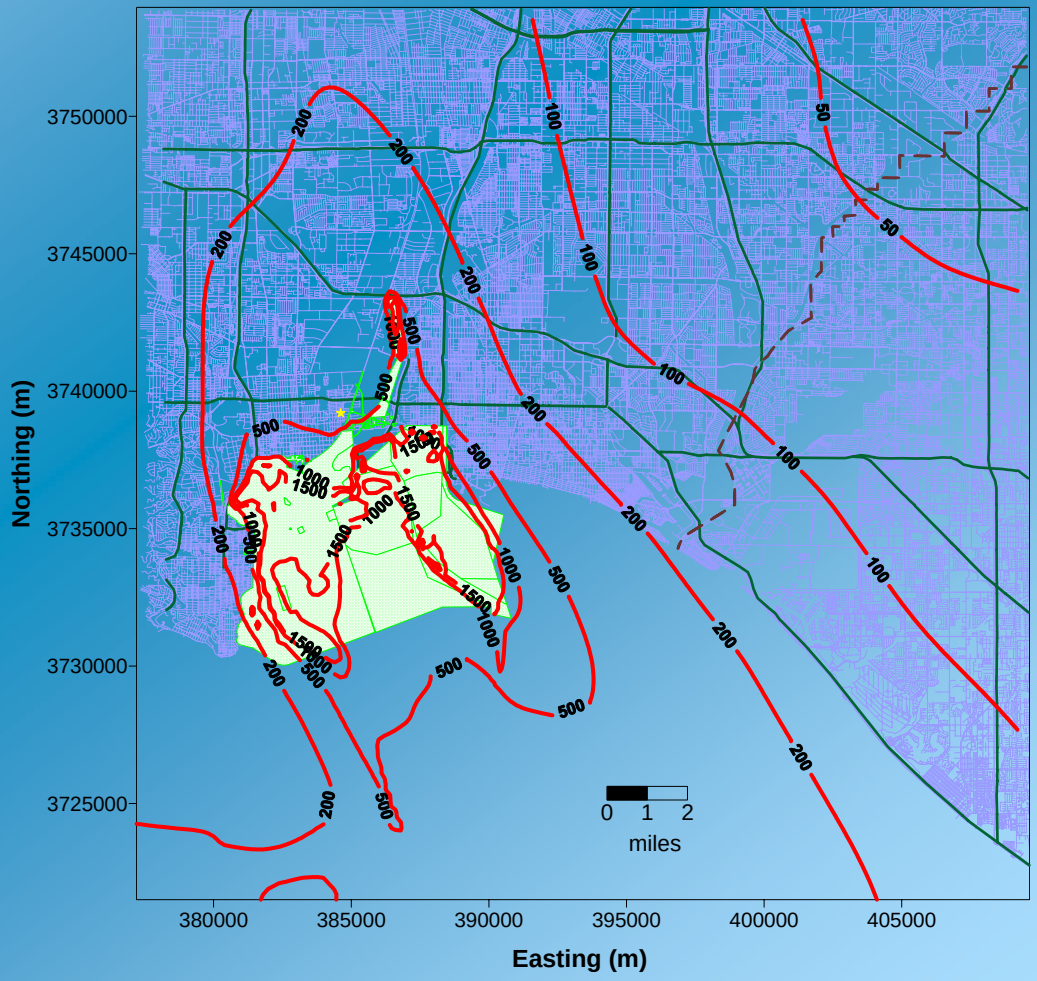
- Health Risk Assessment (HRA) for Ports of Los Angeles and Long Beach completed in 2006
- HRA for Port of Oakland underway

Emissions at POLA/POLB - 2002

	Diesel PM (tpy)	Percent of Total
OGV	942	53
Hotelling	343	20
Harbor Craft	244	14
Cargo Equip	172	10
In Port Trucks	41	2
In Port Loco	18	1
TOTAL	1760	100

Risk Results at POLA/POLB

- Results show impacts over much of SC Basin
- High near source risk



Top Contributors to Risk Over 100 in a Million

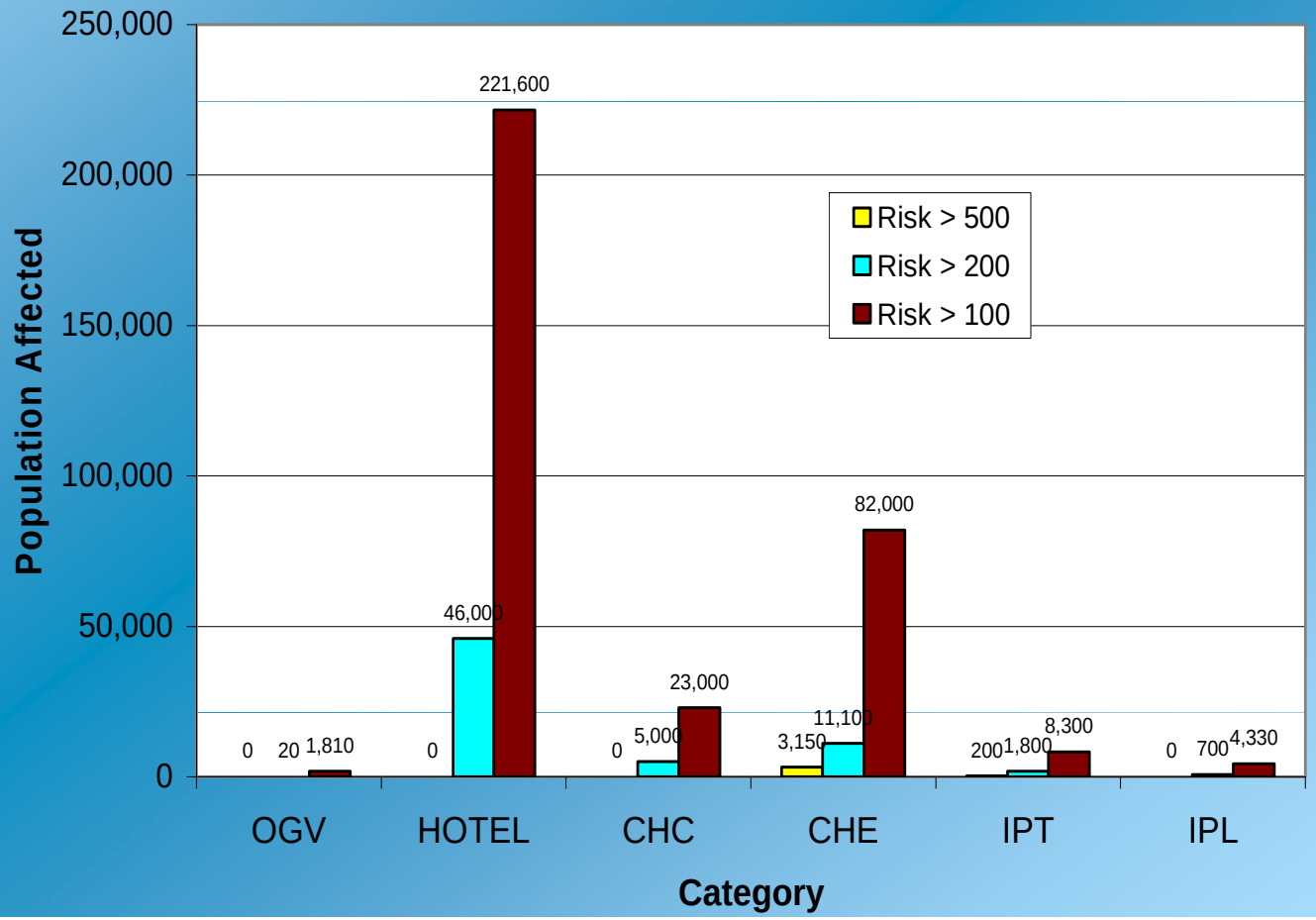
Source categories ranked

Hotelling from OGV > Cargo Equip > Harbor craft > Trucks

By both population affected and area impacted

Risk by Source Categories

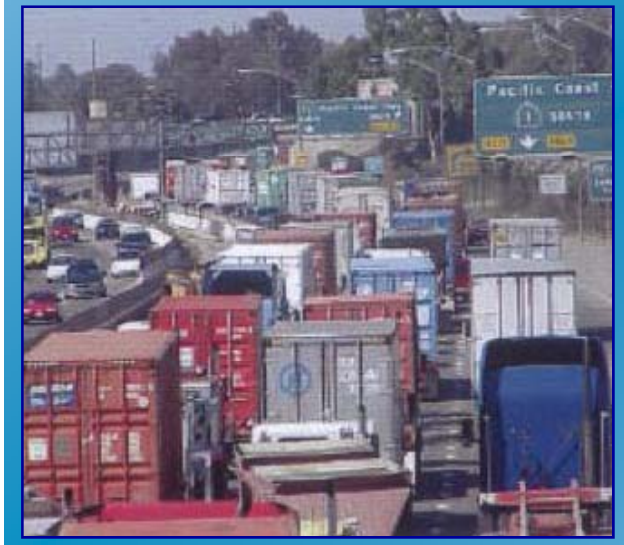
Population Affected within the Model Domain by Cancer Risk Levels and Source Categories



Community Health Risk

Near-source cancer risk (2000-2002)

- High traffic freeways: 300-1,700/million
- Port of LA/Long Beach: 10-500+/million
- Roseville Rail yard: 10-500/million



Health Impacts of Goods Movement Statewide

	Cases/Year in 2005
Premature death*	2,400
Hospital admissions (heart)	830
Hospital admissions (lung)	2,000
Acute bronchitis	5,100
Asthma/other respiratory	62,000
Absences/restricted days	4.4 million

**Uncertainty range is 720 to 4,100 deaths/year*

ARB Emission Reduction Plan for Ports and Goods Movement in CA (March 2006)

Goals:

Reverse growth in emissions

- By 2010, reduce emissions as much as possible, at least to 2001 levels

Reduce diesel PM risk

- Rapid reduction in community risk
- By 2020, reduce statewide risk 85%

Attain federal PM2.5, ozone standards

ARB Strategies to Reduce Impacts

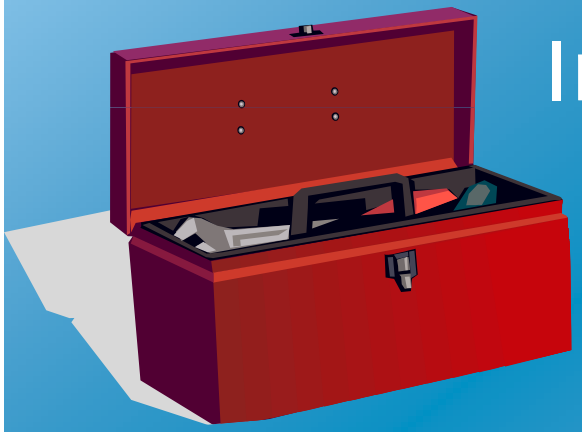
Regulations and Enforcement

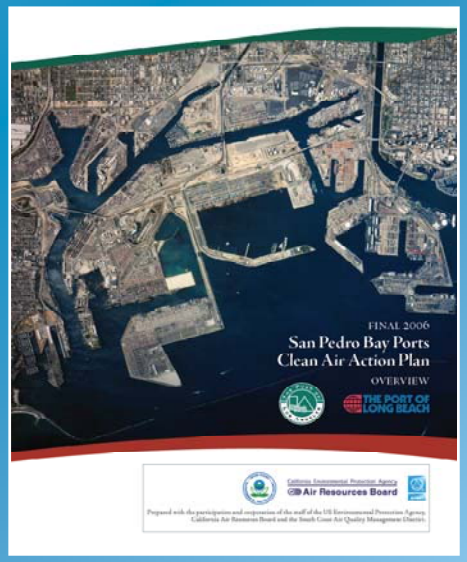
Enforceable agreements

State Implementation Plan

Incentives

Stakeholder Action





Recent ARB Rules Affecting Ports

- ✓Low sulfur diesel fuel
- ✓Transport refrigeration units
- ✓Truck idling limits
- ✓International trucks
- ✓Ban on ship incineration
- ✓Ship auxiliary engine fuels
- ✓Diesel cargo equipment
- ✓Gas forklifts

Commercial Harbor Craft Regulation

- Ferries, excursion vessels, tugboats, and towboats – accelerated replacement of Tier 0 and Tier 1 engines

  - Must use cleanest available engines for all new vessels and as replacement engines on all in-use harbor craft
  - Reporting, recordkeeping, and monitoring requirements for all commercial harbor craft

- Propulsion engines on new ferries must apply BACT

Proposed Drayage Truck Regulation

- All class-8 diesel-fueled trucks accessing:
  - California's ports; and,
  - Intermodal rail yards within 80 miles of a port.

- Requires:
  - Replace or retire all pre-1994 trucks by 2010
  - 85% PM retrofit on MY 1994-2003 trucks by 2010
  - 2007 standards on MY 1994-2003 trucks by 2014
- Implementation:
  - All trucks register in Drayage Truck Registry
  - Motor carriers only dispatch compliant trucks

Proposed Regulation to Reduce At-Berth Emissions from Ships

- Shore power the expected control technology
- Most cost-effective for container, passenger, and refrigerated cargo ships

- Affected Ports: Los Angeles, Long Beach, Oakland, San Diego, San Francisco, and Hueneme
- Alternative technologies permitted
- Implementation begins 2010
- Goals:
  - 50% reduction in NOx and PM by 2014
  - 80% reduction in NOx and PM by 2020

OGV Main Engine & Auxiliary Boiler Regulation

- Achieve significant emissions by requiring the use of cleaner distillate fuels as soon as possible
- Board consideration – April 2008
- Align main engine regulation with auxiliary engine rule
- Applies within the 24 NM boundary

Future ARB Actions

(2008-2009)

- Privately-owned trucks
- Cleaner ships
- Speed limits for ship

SIP Commitments

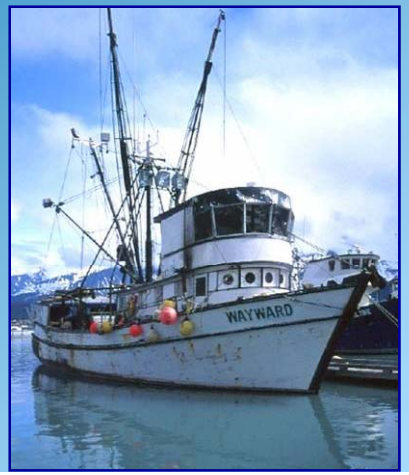
- All ARB port-related regulations are part of our SIP commitment
- Reductions needed in South Coast and San Joaquin Valley :
  - By 2014 to meet PM2.5 standard
  - By 2024 to meet ozone standard

Role of Incentives

- Regulations remain the framework
- Incentives (grants, low-interest loans) are key to accelerate benefits
  - Sources without financial resources to fund cleanup quickly
  - Sources outside California's authority

State Incentives

- Highway Safety, Traffic Reduction, Air Quality & Port Security Bond Act of 2006
  - $1 billion to reduce emissions from freight movement in trade corridors
- Carl Moyer Program
  - $140 million/year through air districts



Example Candidates for Near-Term Incentives

- Truck replacement/retrofits
- New switcher locomotives
- Shore power infrastructure
- Harbor craft engine replacement
- Must be surplus

Partners for Cleaner Ships

- International bodies
- Air agencies
- Ports
- Shippers
- Environmental and community groups

Federal Actions are Critical

- Adopt stringent emission standards for marine and locomotive engines
- Adopt MARPOL Annex VI for ships
- Provide substantial funds to clean up legacy fleet of diesel engines
- Push for aggressive international standards for ships and aircraft

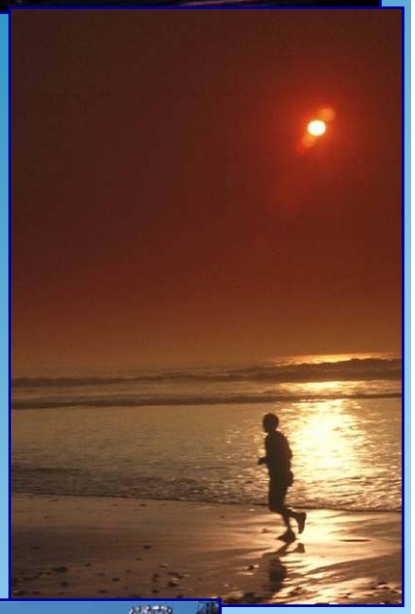
Shipping Initiatives

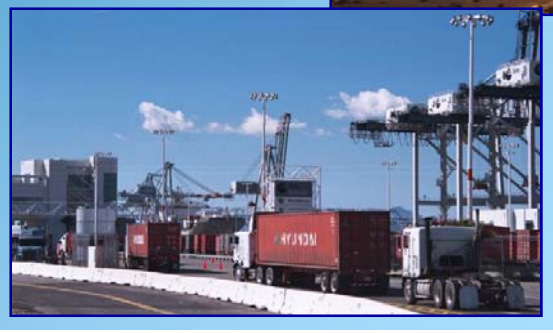
- Shore-power: Princess cruise ships (Alaska, Seattle), NYK Atlas cargo ship (LA), BP tankers (Long Beach)
- Low-sulfur fuel: Maersk cargo ships
- Technology demonstration: APL cargo ship with slide valves/emulsified diesel (LA, Oakland, Pacific Rim)

Industry Action Needed

- Use 0.1% sulfur marine gas oil-auxiliary engines
- Use low sulfur distillate fuel-main engines
- Reduce vessel speeds to 12 knots near CA ports
- Use shore-side power if capable
- Purchase new build green ships
- Consider slide valves during major maintenance
- Support regulatory actions

Summary





- Implement Goods Movement Emission Reduction Plan
- Utilize incentive programs:
  - $1 billion grant program
  - Carl Moyer
- Push federal/international standards
- Work with stakeholders
- Support local initiatives

Contact Info

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