



Proposed Control Measure for Ocean-Going Vessels At Berth

December 5, 2019

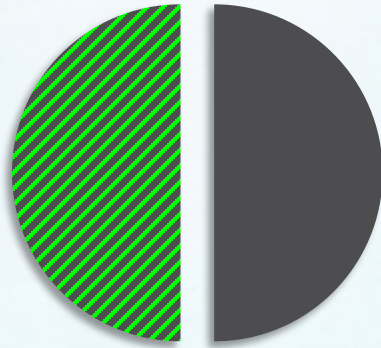
Overview

- Background and introduction
- Need for Proposed Regulation
- Summary of staff proposal
- Costs and benefit valuation
- Incentives
- Projected emissions reductions and benefits
- Staff recommendation and next steps

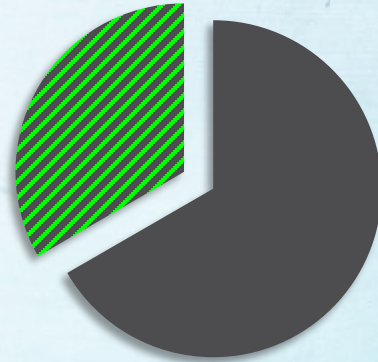


California Freight Activity Has Significant Impacts

- California's freight sector helps drive the State's economy, but is also a large source of air pollution
- 85% reduction in cancer risk since 2005 at largest ports, but additional reductions are needed

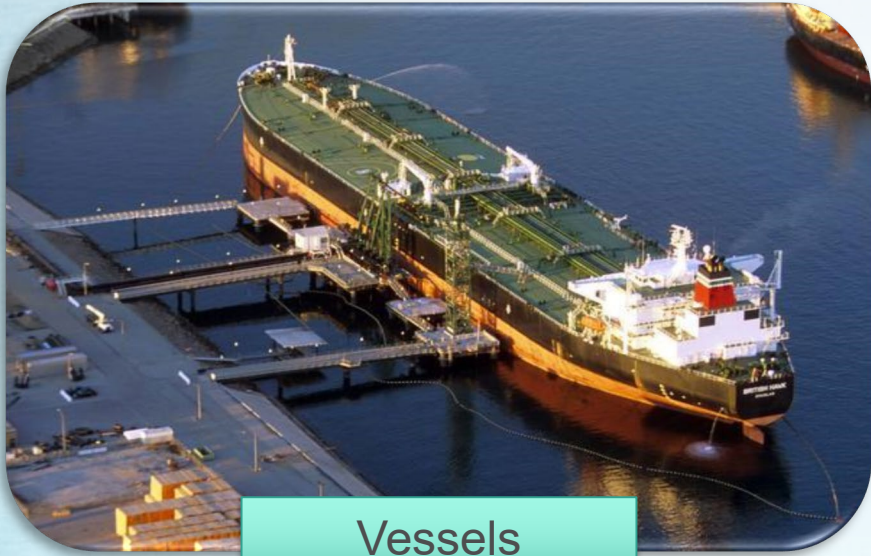


~1/2 of air pollution

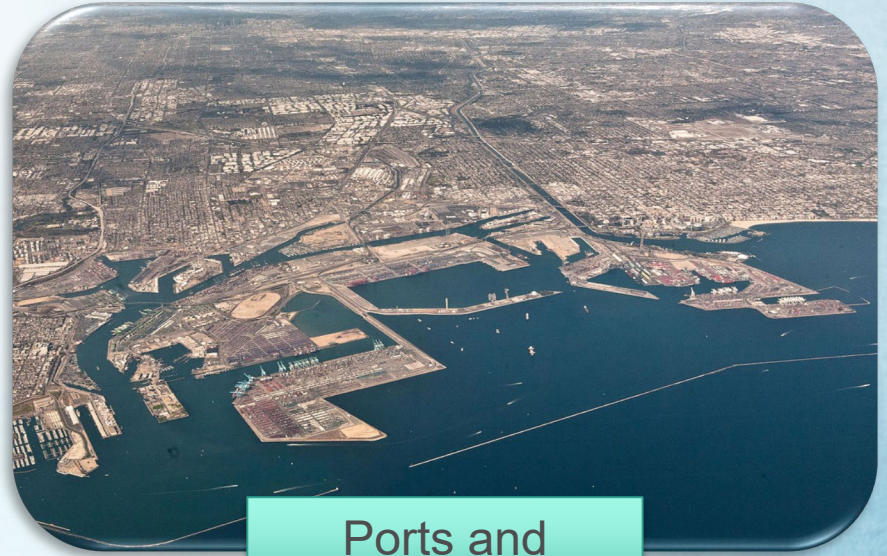


~1/3 of economy/jobs

Key Players



Vessels
At Berth



Ports and
Terminals

Role of Ocean-Going Vessels

- Large commercial vessels moving cargo over water
- Operate auxiliary engines and boilers at berth and at anchor
 - Generate emissions of NO_x, PM, diesel particulate matter (DPM), ROG, GHG, black carbon, and other pollutants
- Types of vessels visiting California: container, refrigerated cargo (reefer), cruise, roll on-roll off (ro-ro), tanker, bulk, and general cargo
- Average vessel stays range from <24 hours to >5 days

Existing At-Berth Regulation

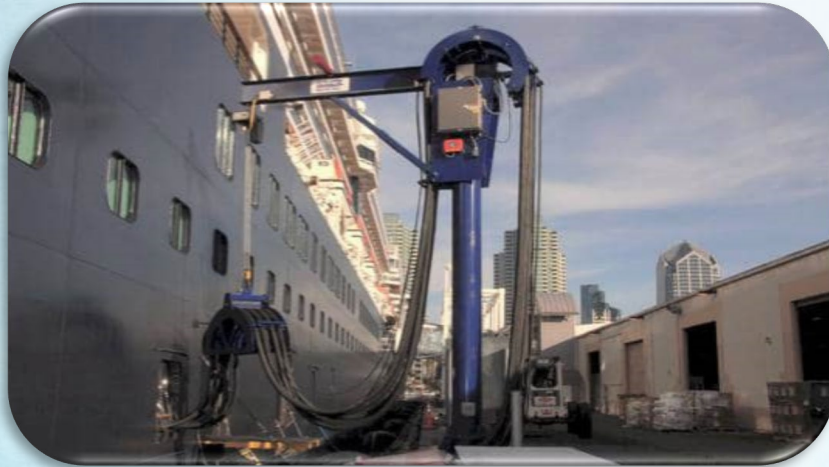
- Adopted in 2007, with implementation beginning in 2014
- Targets emissions from auxiliary engines of container, reefer, and cruise vessels
- Vessel visit and power reduction requirements: 50% in 2014, 70% in 2017, 80% in 2020
- Includes 6 ports: Los Angeles, Long Beach, Oakland, San Diego, San Francisco, and Hueneme
- Compliance based on fleet-based annual averaging

Building On Success

- Millions of dollars invested in emissions control equipment
 - Shore power installed at 65 berths and on >500 vessels
 - 3 capture and control systems built
- Provided needed public health benefits to highly impacted communities
 - Emissions reduced from over 13,000 visits since 2014
- Enforcement data shows overall reductions are being met by regulated fleets
- Allows for alternative emissions control technologies

Emissions Control Technologies

Shore Power



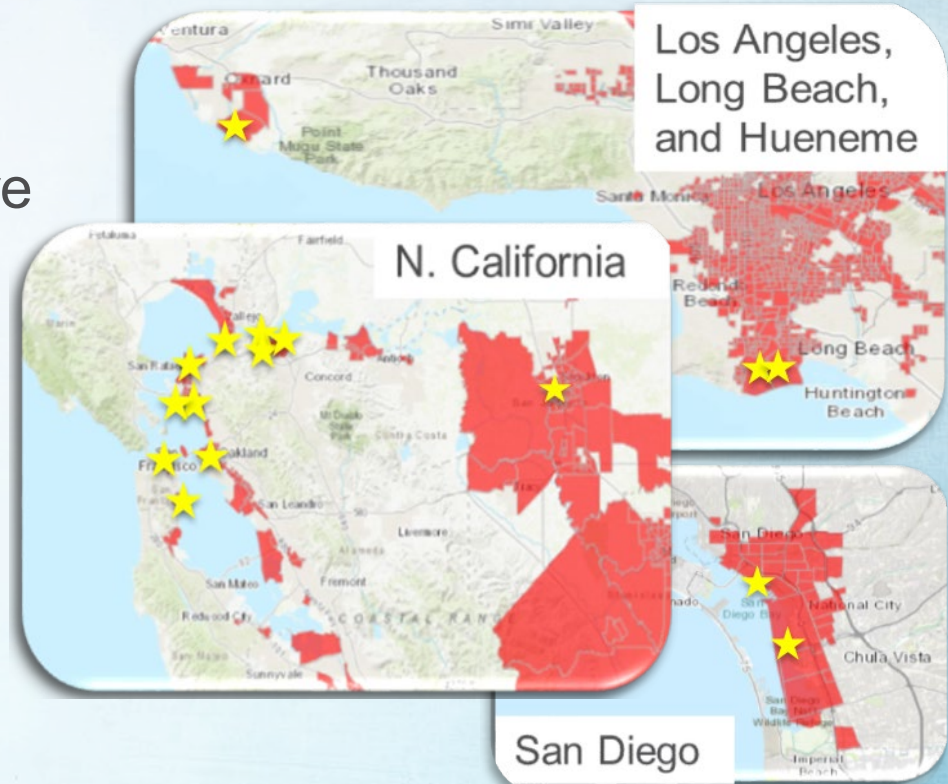
Capture and Control Systems



Potential Strategies: Alternative fuels,
On-board Technologies

Need For Proposed Regulation

- Port communities heavily impacted by freight
 - Increased risk of premature death, hospitalizations, and cancer risk
- Need further reductions and public health benefits
- Address implementation challenges with existing regulation



Public Process

- Extensive outreach efforts
 - 5 sets of public workshops
 - Workshops held in both Northern and Southern California
 - 200+ community and industry meetings/engagements
 - Included vessel tours, and port and terminal site visits
 - Over 70 public comments received and reviewed

Summary of Proposed Regulation

- Would take effect beginning January 1, 2021
- Reduces emissions from auxiliary engines and some tanker boilers
- Based on a per visit compliance structure
 - Allows for shared responsibilities (vessels, terminals, and ports)
 - Streamlines compliance determination
- Contains safeguards to address situations where emissions reductions may be uncertain

Summary of Proposed Regulation (cont.)

- Increases number of visits reducing emissions at berth by including more visits from:
 - Regulated fleets (container, reefer, cruise)
 - Additional vessel types (ro-ro and tanker)
 - New ports and terminals
 - Would result in emissions reductions from an additional ~2,300 vessel visits per year

Overview of Key Changes

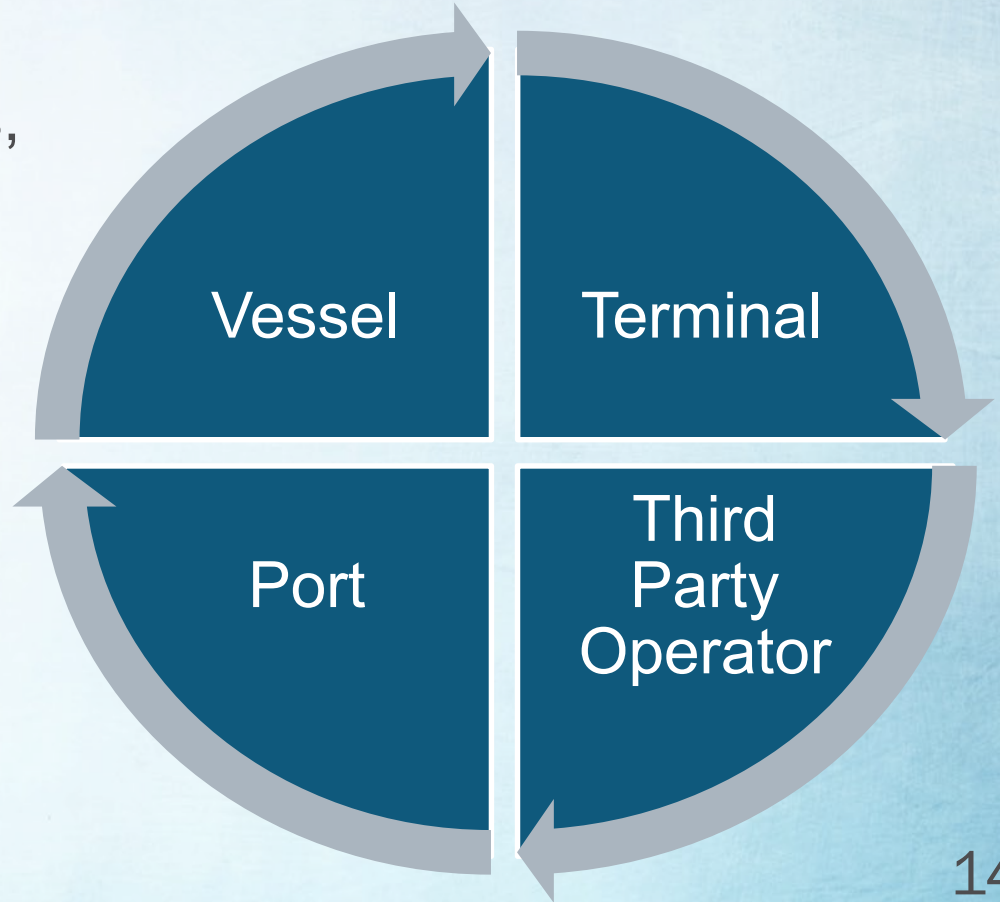
<u>Existing Regulation</u>	<u>Proposed Regulation</u>
Container, reefer and cruise	Expands to ro-ro and tanker vessels
Ports and terminals have limited responsibilities	Shared requirements for vessels, ports, terminals, and third party providers
Compliance based on annual fleet average	Compliance based on individual visit
Covers 6 named ports	Includes more ports and terminals (~10)
Reduces aux. engine emissions	Also reduces tanker boiler emissions
Visit begins when vessel first ties to dock	Adjusting visit start time until after vessel is cleared to work

Included Ports and Terminals



Shared Responsibilities Are Critical

- Vessels, terminals, ports, third party operators all play a role in reducing emissions from vessel visits at berth
- Cooperation is crucial to achieving the emissions reductions and health benefits



Success Requires Action from All Responsible Parties

- Vessels - use a CARB approved emissions control strategy at berth; maintain opacity standards
- Terminals – ensure a CARB approved emissions control strategy is available for use
- Ports - ensure necessary infrastructure exists on port property to reduce emissions
- Third party operators - ensure that technology is CARB approved and certified emissions control levels are met

Implementation Timeline

Vessel Category	2021	2025	2027	2029
Container/Reefer	✓			
Cruise	✓			
Ro-Ro		✓		
Tankers		Interim Review	✓ LA/LB Terminals	✓ Remaining Statewide Terminals

2023

Safeguards to Address Uncertainties

- Safety/emergency exceptions
- Terminal and Vessel Incident Events (TIEs and VIEs)
 - Granted annually based on visit activity
 - Useable for any visit where no reductions are achieved
- Remediation Fund
 - Allows for mitigation of uncontrolled emissions at berth in limited qualifying circumstances
 - Funds received must be invested in projects in the communities impacted by the uncontrolled emissions

Keys to Assessing Progress Towards Compliance

- Port and Terminal plans
 - Submitted prior to implementation dates
 - Detail methods for reducing emissions at berth
 - Help inform the interim evaluation in 2023 for tanker and ro-ro vessels



Interim Evaluation

- Interim evaluation in 2023
- Assess progress made for ro-ro and tanker vessels:
 - Adapting existing or new emissions control technologies
 - Landside infrastructure improvements
- Staff to publish analysis and findings in report by July 1, 2023
 - Present report to the Board at a public meeting
 - Made available for public review

Costs and Benefit Valuation



- Total net costs (2020 - 2032): **\$2.16 billion**
- Statewide valuation from avoided adverse health outcomes summed (2021- 2032): **\$2.25 billion**
- Unit cost per vessel type in 2030:
 - Container/Reefer \$1.11/TEU*
 - Cruise \$4.56/passenger
 - Ro-Ro \$7.49/automobile
 - Tanker \$.008/gallon of finished product

*TEU = Twenty-foot Equivalent Unit

Available Incentive Funding

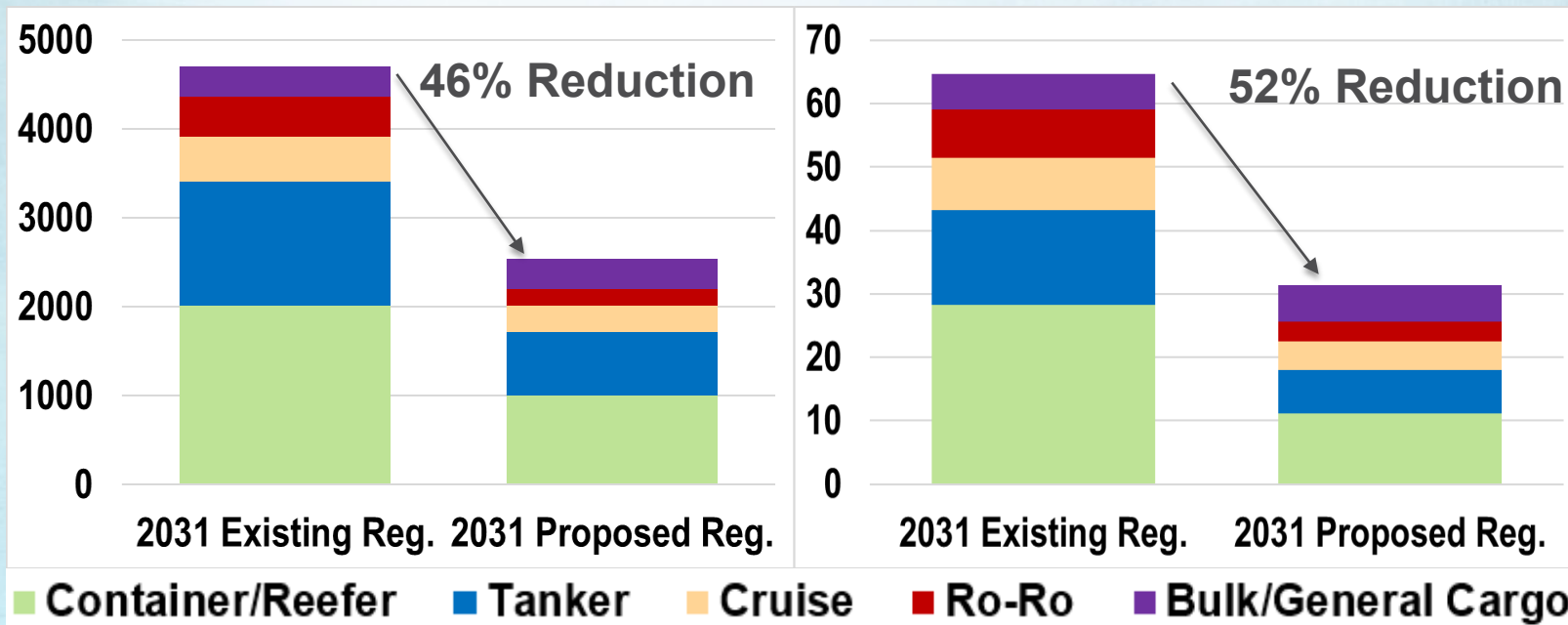
Low Carbon Transportation - Advanced Technology Demonstration and Pilot Projects	Carl Moyer Program*	VW Mitigation Trust*	AB 617 Community Air Protection*	Clean Off-Road Equipment Voucher Incentive Project (CORE)*	Prop 1B Goods Movement*
\$10M	\$94M for FY 19-20	\$423M Total (\$70M for ZE Freight & Marine)	\$245M for FY 19-20	\$40M for FY 19-20	~\$20M (District Dependent)
Capture and control systems for tankers	Shore power, capture and control systems	Shore power	Shore power, capture and control systems	Cable reel management systems	Shore power

*Funds are available statewide, not limited to At Berth projects

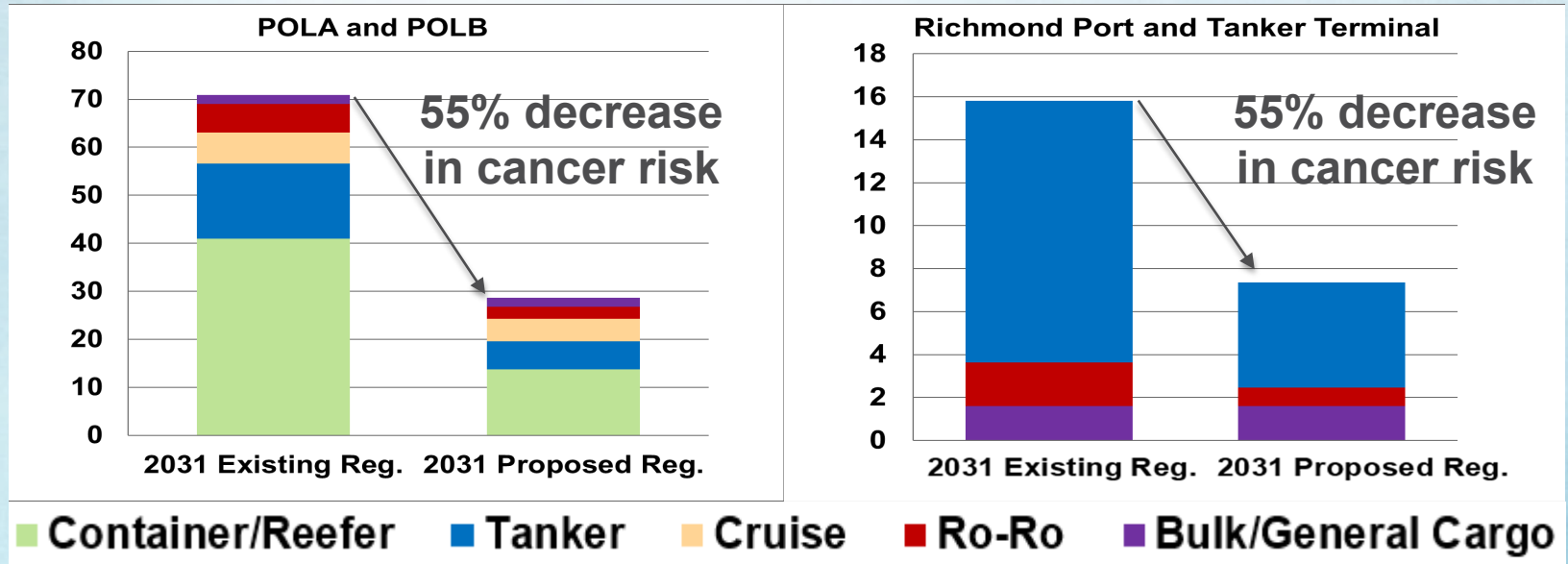
Emissions Reductions

Projected 2031 Statewide NOx Emissions (Tons Per Year)

Projected 2031 Statewide DPM Emissions (Tons Per Year)



Reduction In Potential Cancer Risk of Proposed Regulation (Chances Per Million)



- Non-cancer related benefits: 230 avoided premature deaths, 72 avoided hospital admissions, 16 avoided emergency room visits

Additional Benefits

- Reductions in GHGs, ROG, and black carbon emissions
- Stimulates potential business opportunities for California technology providers and construction workers
- Advances research and development for cleaner marine technologies
- Helps support shore power use outside of California
 - Drives down costs to California users – shore power equipment is more cost effective the more it is used



Environmental Analysis

- Draft Environmental Analysis (EA) completed
- Released for at least 45-Day public comment period
 - October 18, 2019 – December 9, 2019
- Prepare written responses to comments on Draft EA
- Present Final EA and written responses to comments on Draft EA to Board
 - Tentatively Spring 2020

Staff Recommendation and Potential 15-Day Changes

- Staff recommend the Board adopt Resolution 19-28
- Staff will propose 15-day changes, including:
 - Compliance checklist language
 - Reporting deadlines and requirements
 - Proposal for innovative concepts
 - Concepts would have to meet high standard, including enforceability, certainty, being early or in excess of other requirements, and providing equivalent or greater benefits to impacted communities
 - Must not use incentive funding
 - Opportunity for public input before CARB approval

Next Steps

- Final day to submit written comments to the docket is December 9, 2019
- Potential 15-day changes through continued engagement with stakeholders
- Second Board hearing tentatively Spring 2020
- If adopted, regulation is expected to be in effect: January 1, 2021

Thank You

