

# Freight Rail

## November 5, 2007

Port of Oakland MAQIP  
Stakeholder Taskforce Meeting



## Bay Area Operations

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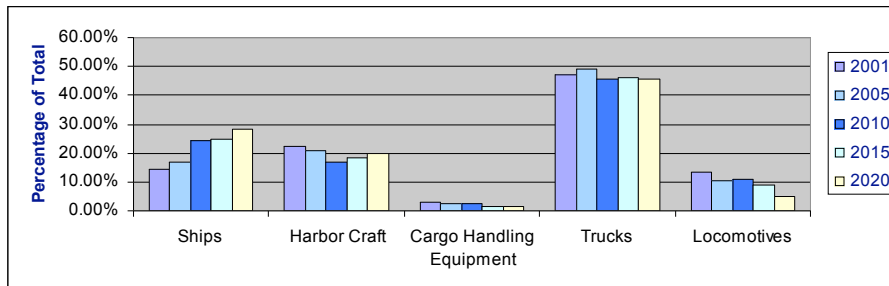
- Union Pacific
  - Oakland Yard
    - Intermodal yard serving the Port of Oakland
  - Several other small yards/sidings (e.g., San Leandro, Redwood City, etc.)
- BNSF
  - Richmond Yard
  - Port of Oakland Intermodal Facility (“OIG”)
    - Located and owned by the Port of Oakland; run by BNSF
    - Intermodal yard serving the Port of Oakland
  - Several smaller yards (e.g., Pittsburg and North Bay)

## California Railroad Freight Flows



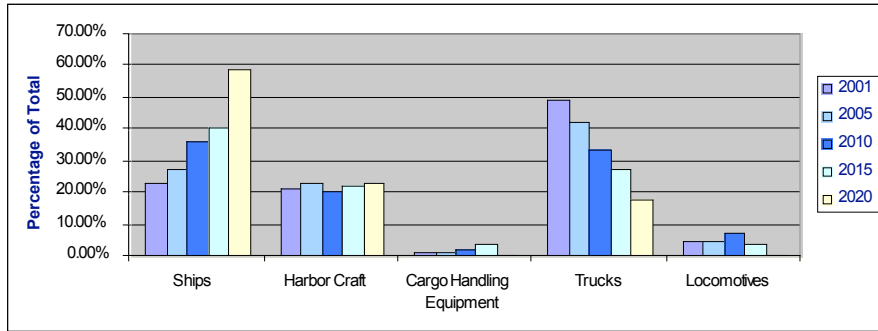
Rail Freight to and from California

## Bay Area NOx Emissions from Ports and Goods Movement w/ Implementation of CARB Strategies



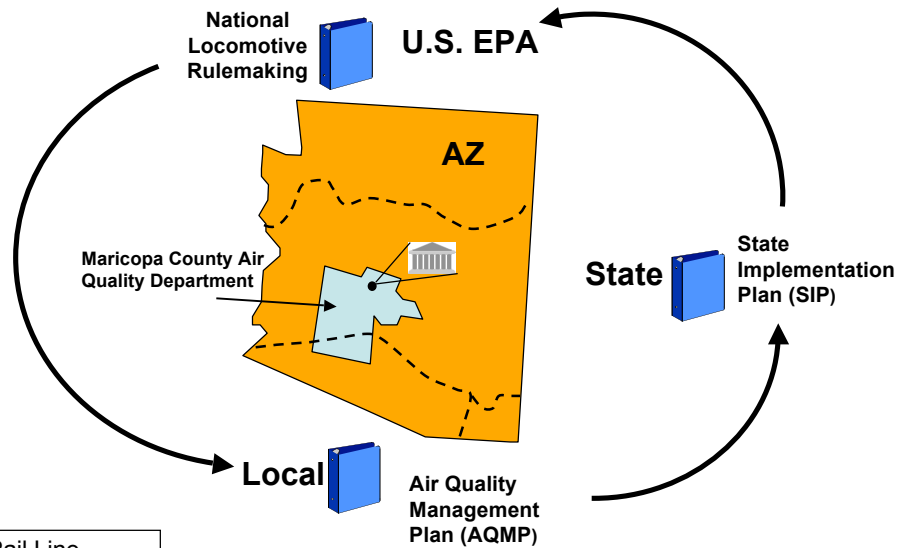
Source: CARB Draft Emission Reduction Plan for Ports and International Goods Movement in CA (3/21/06), Page 118

## Bay Area DPM Emissions from Ports and Goods Movement w/ Implementation of CARB Strategies



Source: CARB Draft Emission Reduction Plan for Ports and International Goods Movement in CA (3/21/06), Page 117

## Air Emissions Regulatory Framework



## Legal: What are the Railroads doing to meet regulations?

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- **Federal**
  - 1994 – Supported and complying with the US EPA's standards for new and re-manufactured locomotives—including:
    - Standards for New Units
    - Retrofit of Existing Units (only urban buses have this requirement)
    - Rebuild Standards (no other mobile source has this requirement)
  - 2007 – Supporting the development of US EPA proposal for new standards for both new and existing locomotives
- **State**
  - CARB Cargo handling rules for cranes and yard tractors
  - CARB rules for refrigerated units
  - CARB off-road equipment

## Economic constraints

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- The Railroads are Port Neutral
  - If a container lands at any of the 4 major port facilities in the west coast, the railroads are prepared to move that container in the most efficient manner available
- The railroads do not determine at which port the container should/will arrive
- Railroads are common carriers – must move any container that meets the basic requirements
- Container/Freight movement is very competitive and price sensitive
- Rail is 3 times more capital intensive than most other industries
  - 17.2% average capital spending as a percent of revenue as compared to paper, chemicals, wood, machining, etc (all under 5%)

## Technological constraints

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- Future Emission Reductions will be driven by the development of new technology.
- Engine Technology is Market Driven and develops through the marketplace
- Diesel engine technology is driven by the US over-the-road truck market
  - 211 Class 8 trucks have been sold for every locomotive since 1972
- Engine technologies “cascade down” through normal marketplace forces
  - Automotive → Truck → Locomotive, Stationary, and Marine
  - Example: Electronic Fuel Injection
    - Introduced into the auto market in *early* 1980's
    - Entered truck market in *late* 1980's
    - Entered locomotive market in 1994
  - Engine technologies cannot be quickly and simply “scaled up”

## Railroads Environmental Improvement Program (1994 – Present)

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- Compliance
  - 1994 – Supported the US EPA's standards for new and re-manufactured locomotives
  - 2007 – US EPA proposal of new standards for both new and existing locomotives
- Beyond Compliance
  - 1998 – Signed MOU with the ARB to ensure on average the cleanest and best locomotives would operate in Southern California by 2010
  - 2000 – Created a \$5 million end-user research & development program for new particulate trap research at Southwest Research Institute
  - 2005 – Signed MOU with ARB projected to reduce PM at statewide railyards 20% by 2008

## 2005 CARB/Rail MOU – Outcomes: 20% Reduction of Railyard PM by 2008

- Over 400 intrastate locomotives will be equipped with automatic shutdown devices with 15 minute idling limitation
- At least 80% of California fueling is ultra low-sulfur
  - Six years earlier than required by federal regulation
- At least 99% of all locomotives will comply with stringent smoke regulations– a much higher rate than any other mobile source
- Health risk assessments will be carried out at 16 major rail yards throughout CA

## Freight CA Rail Air Quality Investments

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- **Line Haul Locomotive Purchases**
  - 1,559 Tier 2 units as of July 1, 2007
- **Switch Locomotive Purchases**
  - At least 60% of units in CA will emit at the ULEL rate
  - New “Gen-Set” switch engines using nonroad and truck engine technologies
- **Automatic Shutdown devices**
  - Installed 383 (85%) on CA units as of July 1, 2007
  - Remaining 15% will be completed by June 2008
- **Bottom Line**
  - UPRR and BNSF have invested **\$277.9 million** in new equipment serving California since 2000

## Are these Programs Helping to Reduce Diesel PM from Railyards? **Yes**

Sources	Emissions (tpy) & Reductions			
	2005 (Base)	2010	% Reduction	Strategy
Through Trains	10	5	50%	'98 MOU
Switcher Locomotives	7	0.7	90%	'98, '05 MOU, CARB Diesel
Loco Refueling	2	0.5	75%	'98, '05 MOU
Cargo Equipment	34	13.6	60%	ARB Rule
Container Truck	7	0.7	90%	Bond (or Moyer) Funding
<b>Total</b>	<b>60</b>	<b>20</b>	<b>65%</b>	

*Based on information the California Air Resources Board staff presented in 1/27/06 ARB Meeting*

## Are the Railroads Doing Their "Fair Share"? **Yes**

	Trucks	Off-Road Equip.	Ships	Aircraft	Urban Buses	Locomotives
Inventory** NOx / PM	29% / 3.2%	17% / 7.5%	13% / 6%	2.4% / 0.5%	2% /	2.5% / 0.8%
Standards for New Units	Yes	Yes	Yes	Yes	Yes	Yes
Retrofit Existing Units	No	No	No	No	Yes	Yes
Rebuild to Standards	No	No	No	No	No	Yes
NOx Fleet Avg. in SCAQMD	No	No	No	No	No	Yes
Statewide PM 2005 MOU	No	No	No	No	No	Yes

(\*\*South Coast AQMP Inventory 2010)

## Bay Area Specific Commitments

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- **Line Haul Locomotive Purchases**
  - 1,559 Tier 2 units as of July 1, 2007
  - Additional Tier 2 locomotives will continue to serve state
- **Switch Locomotive Purchases**
  - Working with Port through Vision 2000 program
- **Automatic Shutdown devices**
  - By June 2008, over 99% of all intrastate locomotives will have devices installed
  - New Tier I and II locomotives are factory equipped with shut down devices
- **Low Sulfur Fuel**
  - At least 80% of California fueling is ultra low-sulfur
  - Six years earlier than required by federal regulation


## Top Three Actions to reduce Freight Rail Emissions in Oakland

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- Invest in Port infrastructure to increase near dock rail
- Invest in rail mainline routes to reduce capacity constraints and physical constraints /alleviate bottlenecks
- Continue to replace switch engines to reduce local impact

## Inherent Efficiencies of Rail

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<b>Capacity</b>	<b>1 double stack train equals up to 280 trucks</b>
<b>Fuel Efficiency</b>	<b>Trains are <u>2-4 times more fuel efficient</u> than trucks on a ton-mile basis</b>
<b>NOx Emissions</b>	<b>Trains are <u>2-3 times cleaner</u> than trucks on a ton-mile basis</b>