

Update on California's Strategies to Reduce Emissions from Railroads and Locomotives



February 24, 2005

California Environmental Protection Agency



Air Resources Board

Overview

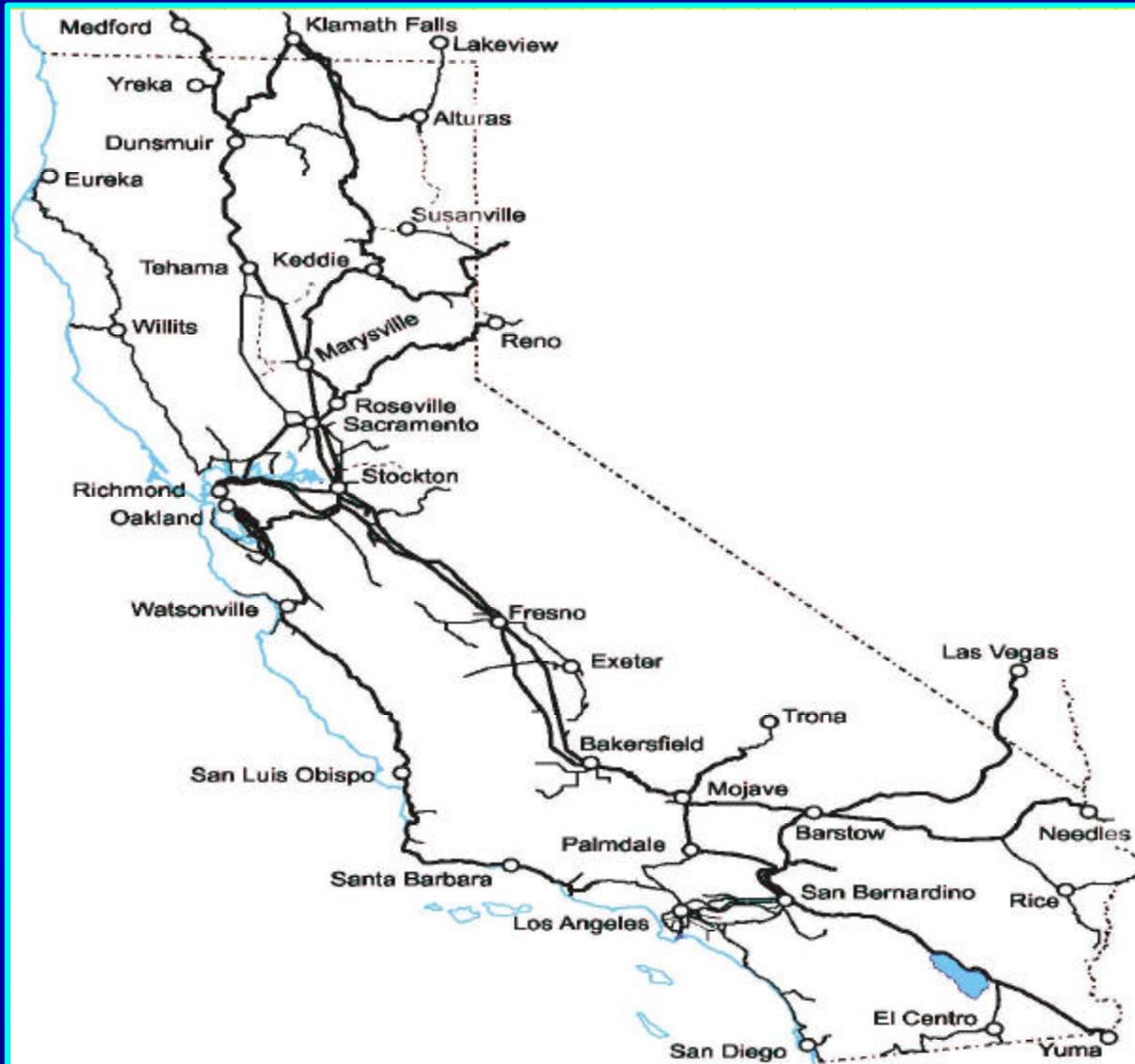
- Background and Emissions
- Health Impacts
- Strategies to Reduce Emissions
- Summary



Types of Railroads in CA

- Class I: Two major railroads in CA are UP and BNSF
- Passenger Trains: Examples: Amtrak, Metrolink, Caltrain
- Class III: Small regional railroads that operate short distance line haul and terminals

California Railroads



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California's Major Railyards



2003 Statewide Locomotive Emission Inventory by Air Basin (tons per day)

<u>AIR BASIN</u>	<u>NOX</u>	<u>PM *</u>
Mojave Desert	46.8	1.3
South Coast	37.8	0.9
San Joaquin	29.5	0.8
Sacramento Valley	25.2	0.6
Bay Area	14.4	0.4
S. Central Coast	9.1	0.4
<u>Rest of State</u>	<u>28.2</u>	<u>0.6</u>
Totals **	192	5

* Directly emitted particulate matter.

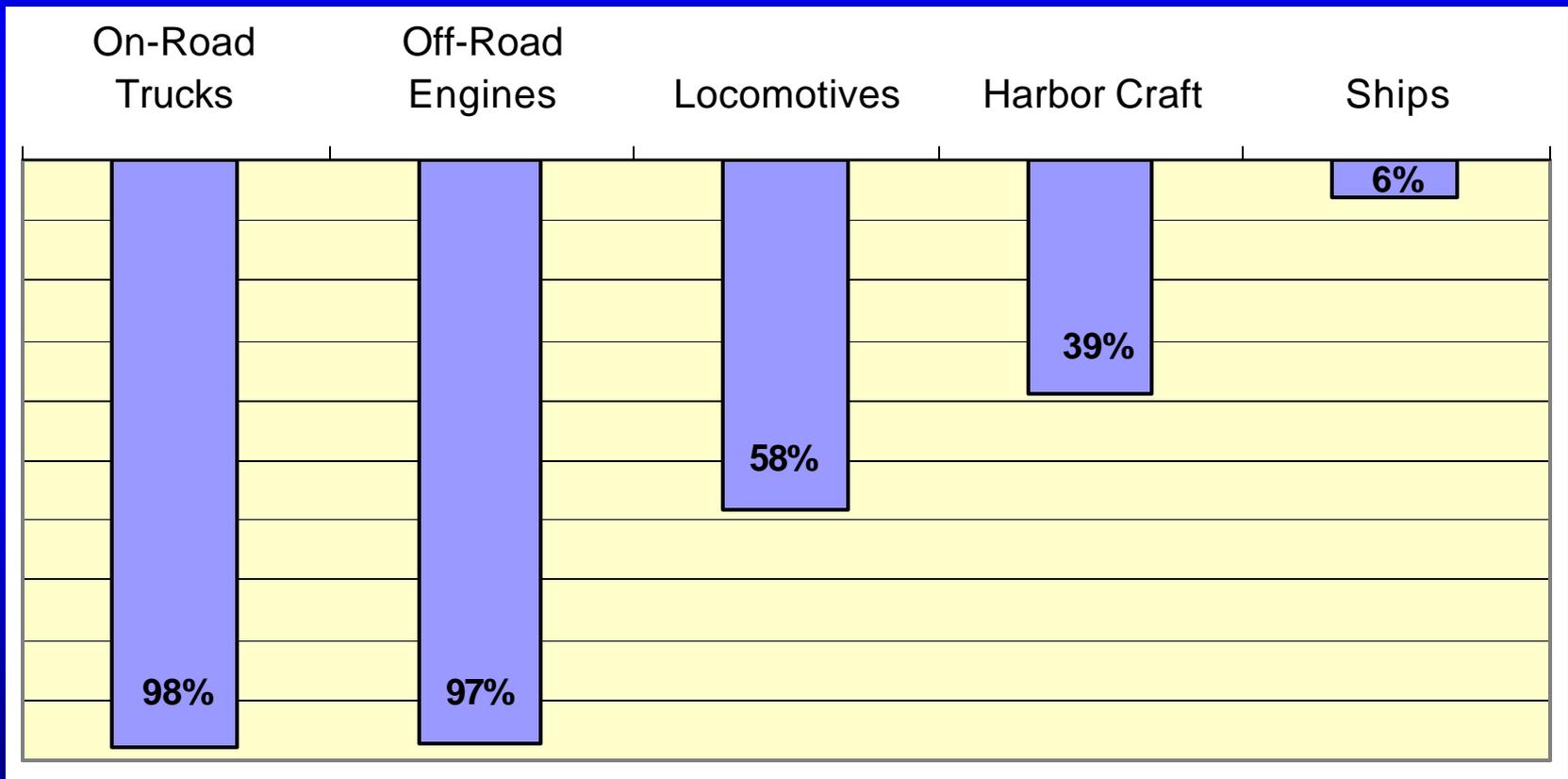
** Numbers may not add due to rounding.

ARB's Limited Authority to Regulate Locomotives

- Federal Clean Air Act preempts California from adopting emission standards for new or rebuilt locomotives
 - 3 tiers of standards phased down through 2005
 - Standards based primarily on engine modifications
 - Applies to “new” 1973 and later locomotives
 - Highly limits CA's authority
- Alternative means to achieve emission reductions must be examined

Effect of Adopted Rules in Reducing NOx Emissions From New Engines

(Percent Reduction Based on Adopted New Engine Standards)



Health Impacts

Rail Yard Air Quality Impacts

- 10 to 12 major rail yards in State
- In 2004 completed detailed health risk assessment of Roseville Rail Yard
- Concluded major rail yards are a significant source of diesel PM
- Rail yard activity will result in both near source and regional diesel PM impacts
- Extent and magnitude of diesel PM impacts will vary

Roseville Rail Yard

- Located near City of Roseville
 - Occupies about 950 acres, 2/3 in Placer County and 1/3 in Sacramento County
- Maintenance, service and classification yard (24/7 operation)
- In operation since 1905
- About 31,000 locomotives stopped at the Yard in 2000
 - additional 15,000 trains passed through



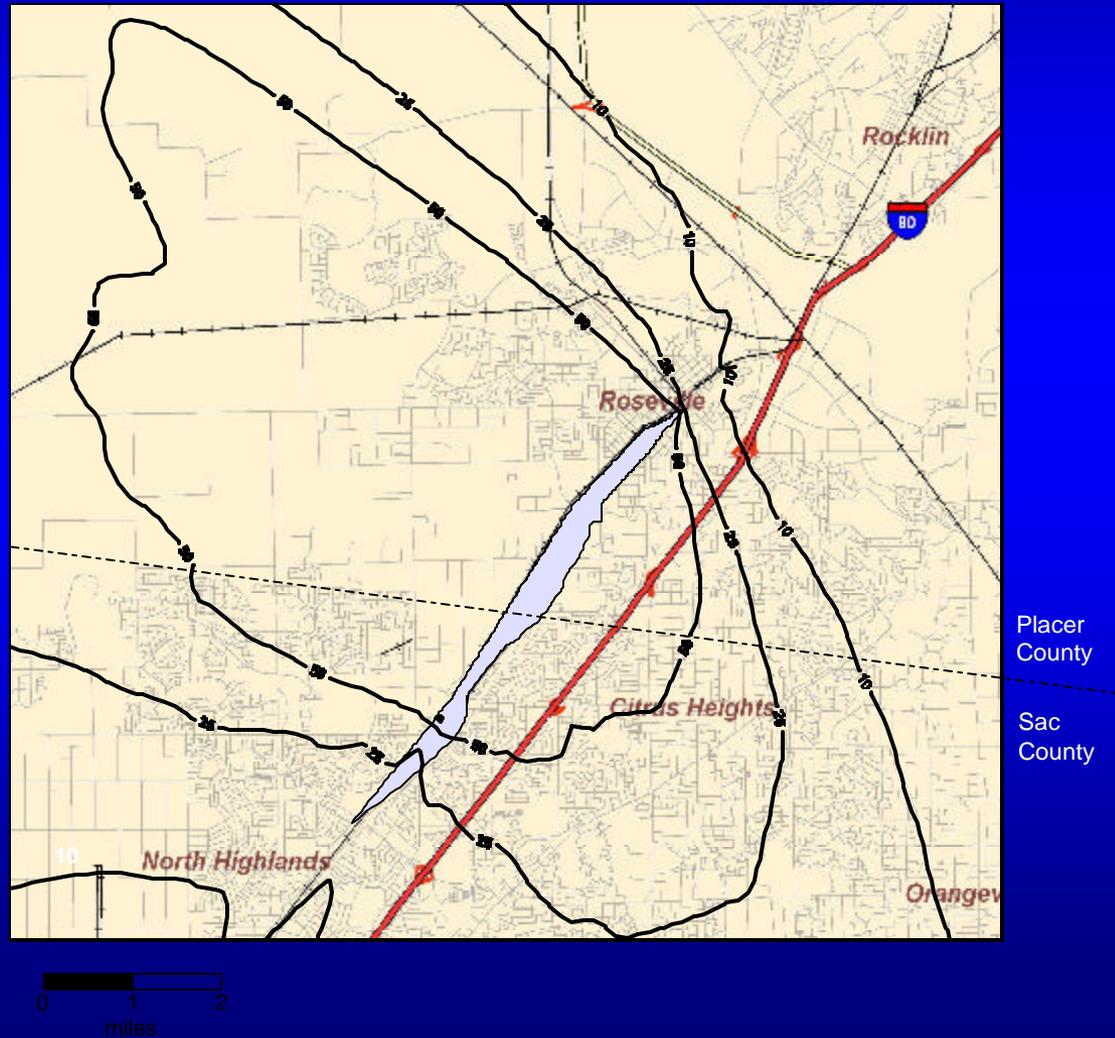


Findings

- Year 2000 Diesel PM emissions: 25 tons/year
 - Moving locomotives account for about 50 percent of emissions, idling locomotive about 45% and testing accounts for about 5%
- Large region impacted by the Diesel PM emissions from the Yard
 - Potential cancer risks greater than 500 in a million (10-40 acres)
 - Potential cancer risks greater than 100 in a million occur over a 700-1600 acres
 - Potential cancer risk greater than 10 in a million occur over 46,000-56,000 acres impacted between 140,000 and 155,000 people

Estimated Cancer Risk from the Yard

10, 25, and 50 in a million risk isopleths, Roseville Met Data



Strategies to Reduce Emissions

Current Efforts



- Federal Tier 2 standards
- CARB diesel fuel for intrastate locomotives
- Rail MOU (South Coast Region)
- Voluntary efforts / Moyer Program

Air Districts Efforts

- Placer APCD
 - Agreement with UP to reduce diesel PM emission by 10 %
- South Coast
 - February 2005 proposed several rules limiting idling and requiring HRA
- Moyer Funded Projects

Future Efforts

- Rail MOU (Statewide)
- U.S. EPA Tier 3 Standards
- Emission reduction projects
- Additional risk assessments



Statewide Rail MOU

- Accelerated turnover to Tier 2 engines
- Reduce idling
- Cleaner switch engines
- Greater use of CARB diesel
- Enhanced smoking locomotive identification/repair program
- Demonstration and implementation of lower emission technologies
- Public input



Future Federal Standards

- EPA released ANPRM - effort likely to include aftertreatment based standards
- ARB submitted comments on ANPRM
 - Aftertreatment based standards as quickly as feasible
 - Idle limiting requirement
 - OBD system
 - Revise original standards

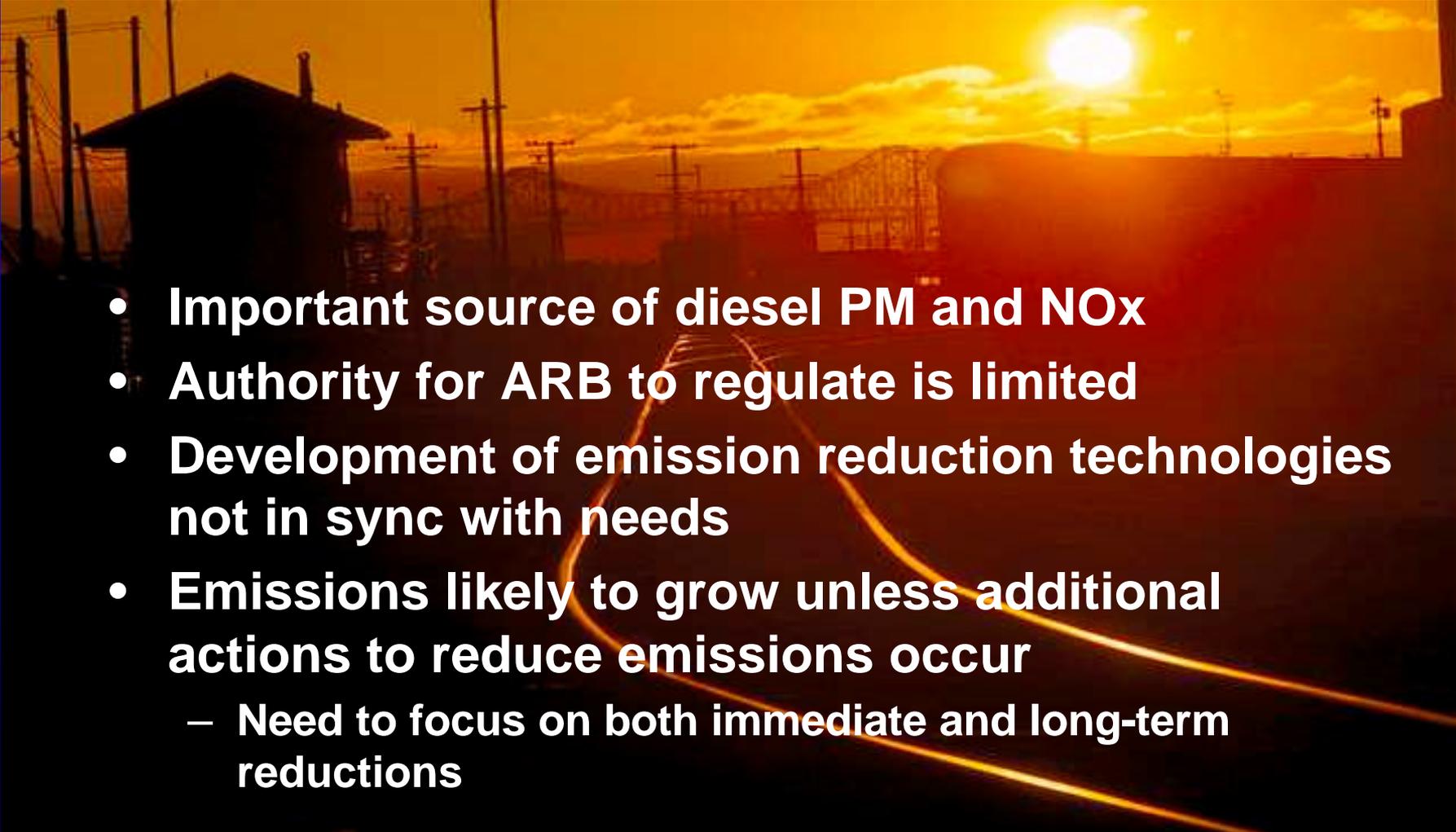


Emission Reduction Projects

- Idle Reduction Devices
- Hybrid switchers
- DPFs on switchers
- Multi-engine switchers
- Rebuild switchers to Tier 2 standards
- Alternative fuels



Summary

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- **Important source of diesel PM and NOx**
 - **Authority for ARB to regulate is limited**
 - **Development of emission reduction technologies not in sync with needs**
 - **Emissions likely to grow unless additional actions to reduce emissions occur**
 - **Need to focus on both immediate and long-term reductions**