

State Activities to Reduce Locomotive Emissions in California

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Overview

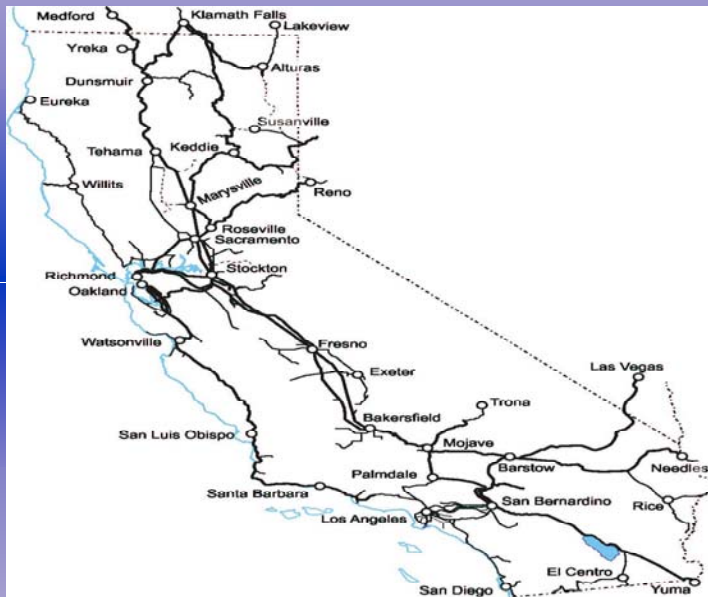
- What is the need?
- What is the plan?
- Where are we now?
- What else do we need?



What is the need?

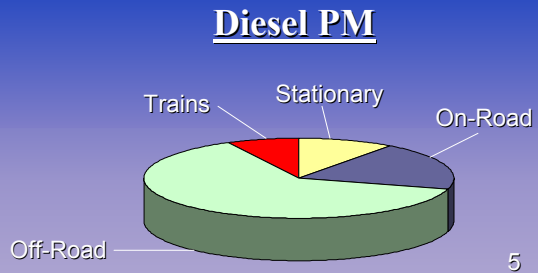
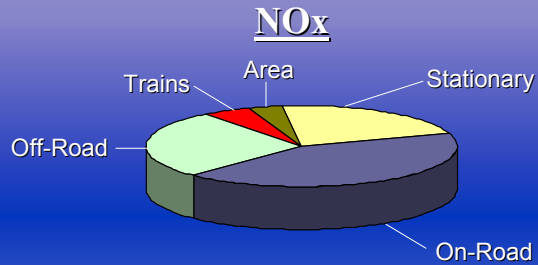
What is the need?

California Rail Lines



Statewide 2005 Locomotive Inventory

| AIR BASIN | NO _x | PM |
|-------------------------------|-----------------|-----|
| Mojave Desert | 38 | 1 |
| South Coast | 32 | 1 |
| San Joaquin | 25 | 1 |
| Sacramento | 20 | 0.5 |
| Bay Area | 14 | 0.5 |
| Salton Sea | 9 | 0.5 |
| Rest of the State | 23 | 0.5 |
| Statewide Total | 160 | 5 |
| % of Statewide Mobile Sources | 6% | 4% |



Rail Yard Impacts

- Risks are elevated near major rail facilities
- Roseville study
 - High risks in nearby neighborhoods
 - Elevated risk several miles away
- Other major rail yards need analysis and mitigation





What is the Plan?

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What is the Plan?

Locomotive/Rail Yard Strategy

- Integrated effort
 - Mutual agreements with railroads
 - State regulations
 - Incentive programs
 - U.S. EPA rulemaking for Tier 3 locomotives
- Also part of Governor's Goods Movement Action Plan

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Statewide Railroad Strategies

- South Coast NOx MOU - **1998**
- Clean diesel fuel for captive locomotives - **2004**
- Statewide Agreement (idling, etc.) - **2005**
- Cargo handling rule - **2005**
- National “Tier 3” locomotive standards - **2007**
- Replacement of aged CA switcher fleet - **2010**
- Accelerated locomotive turnover - **TBD**

Overall Emissions Goal

- Greater than a 90% reduction in diesel PM and NOx by 2020
- Localized risk reduction

Multi-Nonroad Engine Switch Locomotive



Green Goat Electric-Hybrid Switch Locomotive

EMD EPA Tier 2 Switch Locomotive



Where are we now?

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Where are we now?

Accelerated Fleet Turnover: Line Haul Locomotives

- Requires accelerated turn-over to Tier 2 locomotives by 2010
- Achieves 65% NOx reduction in SCAQMD
- Cuts NOx 15% elsewhere in CA

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Cleaner Switcher Locomotives

- Low-emission locomotives
 - 2 Green Goats delivered in 2005; 8 more ordered
 - 1 Gen-set switcher delivered
 - Bids being sought for about 60 more

- 2 switchers to be retrofitted with DPFs



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Cleaner Fuel

- 2004 Intrastate Locomotive Fuel Rule
 - CARB diesel in California locomotives

- 2005 Statewide Agreement
 - At least 80% of fuel will be ULSD

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2005 ARB/Railroad Statewide Agreement

- Limit idling
- Install anti-idling devices
- Identify and repair smoking locomotives
- Conduct health risk assessments
- Design risk mitigation measures
- Evaluate future technologies

Installation of Idle Reduction Devices on California Locomotives



California is Ahead of the Nation on Switcher Retrofits

- National: 15%
- California: 32%



More Frequent Visible Emission Inspections

- Over 16,000 opacity inspections performed in 2005



| | |
|-----------------------|--------|
| Opacity Meter | 200 |
| U.S. EPA Method 9 | 10,410 |
| Screening Inspections | 5,410 |
| Total Inspections | 16,020 |

Health Risk Assessments (HRAs) at 17 Rail Yards

- Guidelines being developed
- One HRA already complete
- Draft HRAs to be completed by:
 - December 31, 2006 for the first 9 Yards
 - December 31, 2007 for the next 7 Yards

Remote Sensing

- Initiated locomotive remote sensing feasibility study
- Goal: identify “gross polluting” locomotives
- Study plan being developed
 - Testing to begin late spring
 - Report to Legislature due at end of year

Potential Funding Mechanisms

- Carl Moyer Program
 - 10% set aside for goods movement
- Proposed \$1 billion bond
 - Potential use of \$225 million to upgrade switcher fleet through cost share

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EMD SD70ACe – EPA Tier 2

GE ES44AC – EPA Tier 2



What else is needed?

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Full Control by 2020

- Greater than a 90% emission reduction
- To accomplish requires:
 - Effective national Tier 3 locomotive rule
 - Accelerate Tier 3 use in California

Tier 3 U.S. EPA Rulemaking

- Locomotive and marine engines
- Aftertreatment for new engines
- More stringent rebuilds for existing
- National idling limits
- Requirements for OBD

Once Rule is Done

- Accelerate introduction of advanced technology in California
 - New agreement with railroads