

Diesel Engine Strategies

Erik White



2007 SIP Symposium

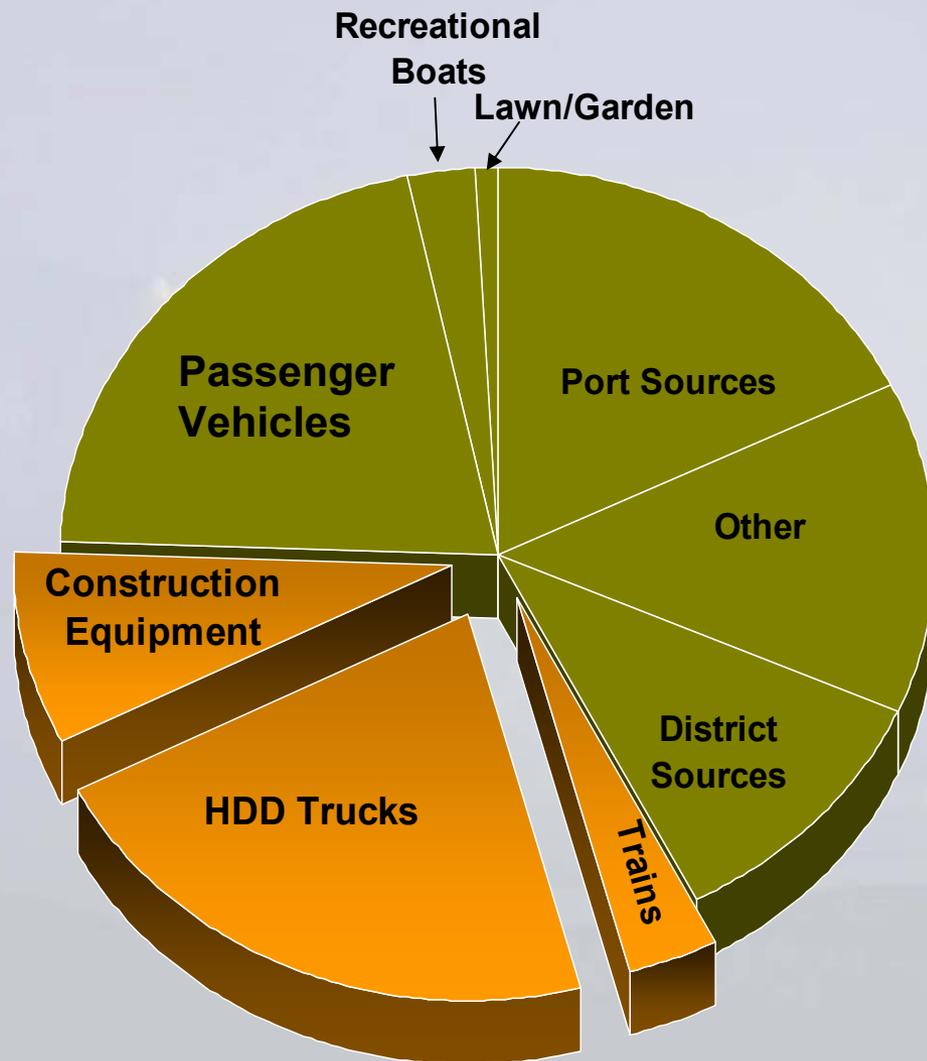
Near-Term Programs and Likely SIP Concepts

- **On-road trucks**
- **Off-road equipment**
- **Locomotives**
- **Incentives and enforcement**



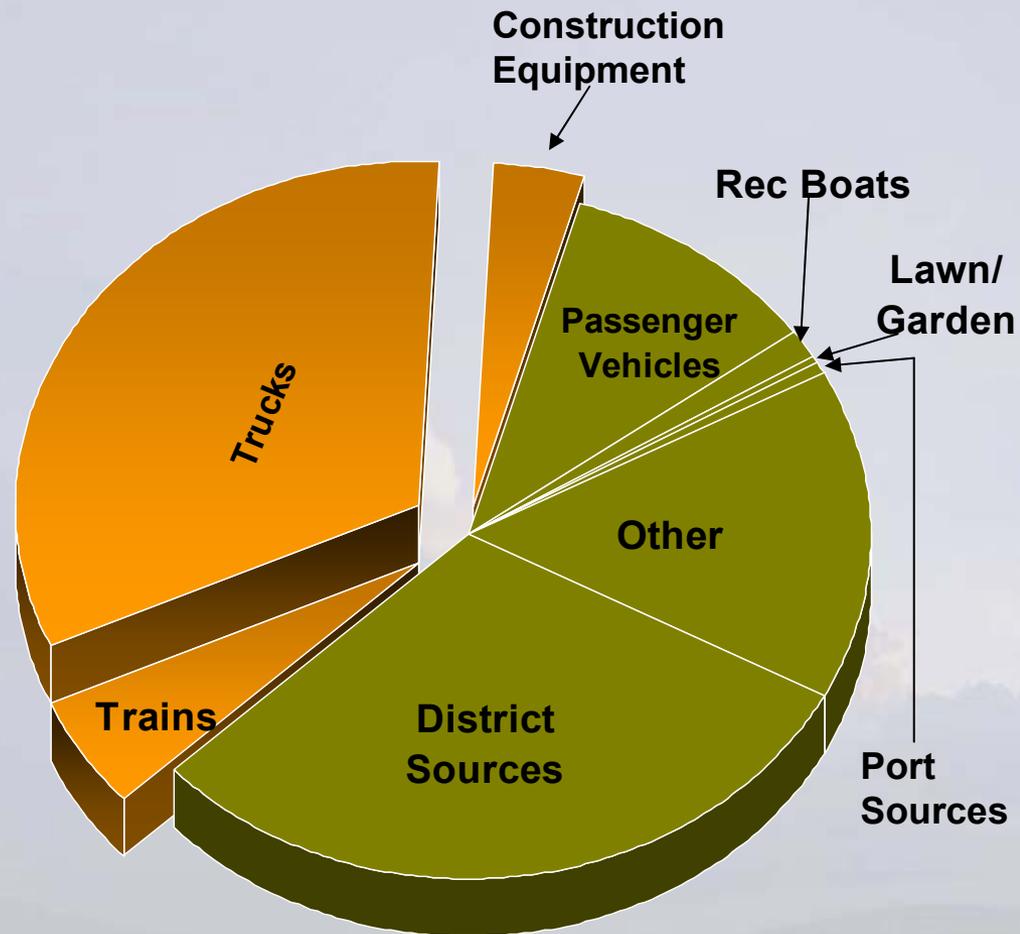
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South Coast 2015 NOx Baseline



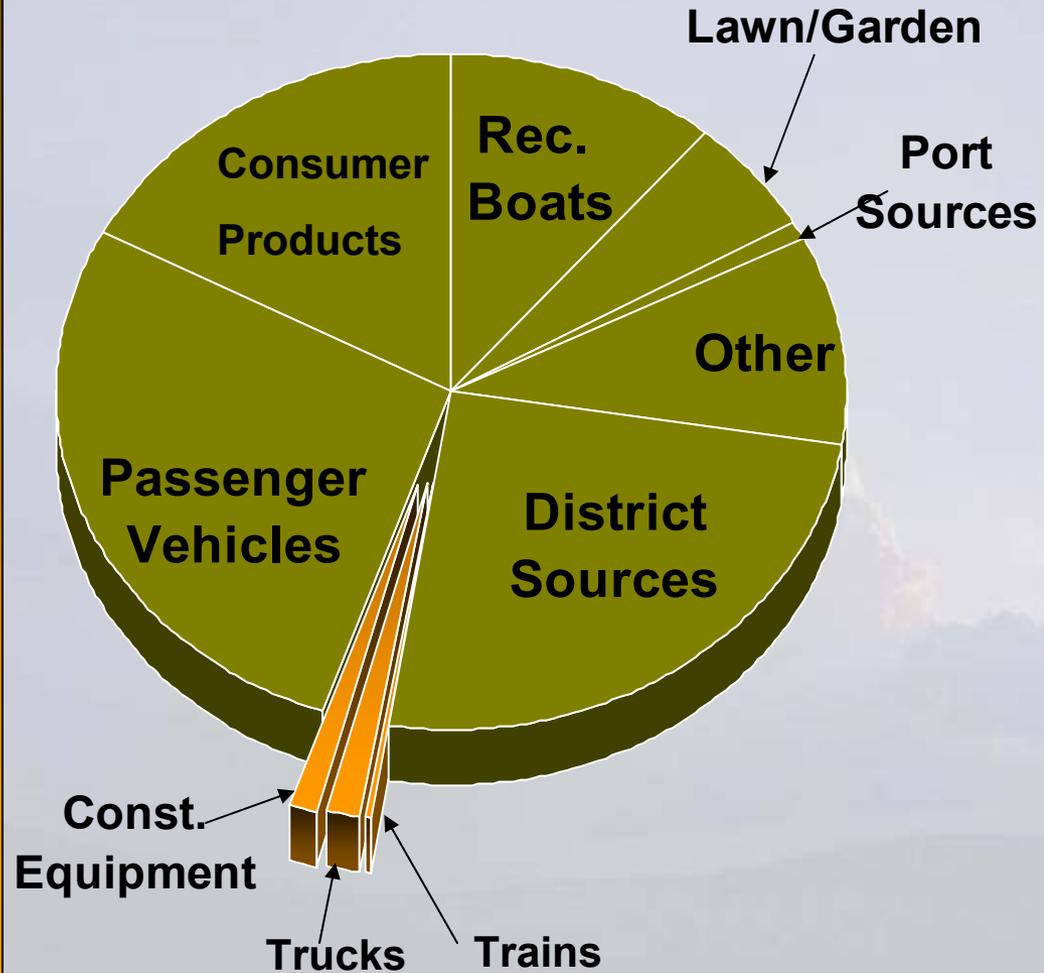
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San Joaquin Valley 2015 NOx Baseline



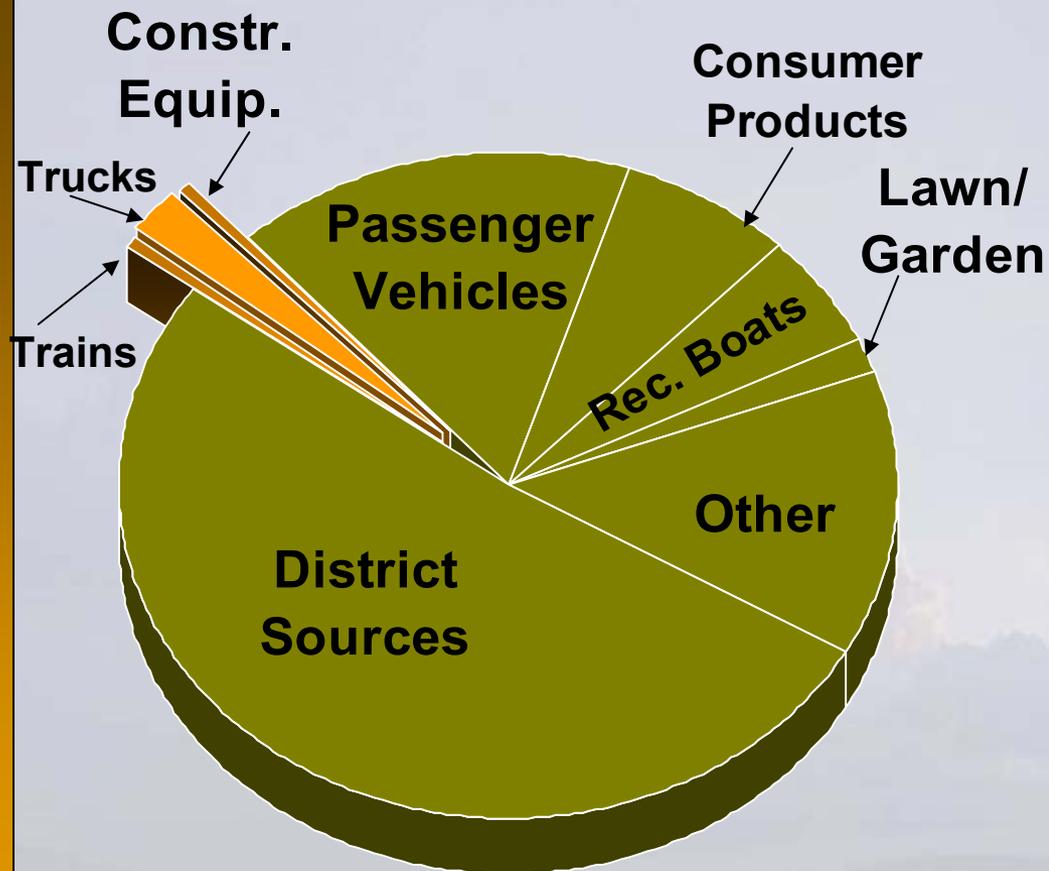
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South Coast 2015 ROG Baseline



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San Joaquin Valley 2015 ROG Baseline



Port sources are 0.1%



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On-Road Trucks



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On-Road Trucks

**Baseline emissions in the
South Coast for on-road
trucks, in 2015**

- **137 tpd NO_x**
- **13 tpd ROG**



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On-Road Trucks

- **Two concepts proposed**
 - **Expanded truck fleet modernization program**
 - **Truck emissions tracking and inspection program**



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Private On-Road In-Use Heavy-Duty Diesel Truck Fleet Rule

- **Statewide Private On-Road In-Use Heavy-Duty Diesel Truck Fleet rule currently under development**
- **Rule would affect 42,000 trucks in South Coast**
- **Replacement, repower, retrofit**
- **Board hearing scheduled for mid-2007**



Expanded On-Road Truck Fleet Modernization Program

- Additional future reductions may be necessary
- Accelerate turnover of on-road heavy-duty trucks
- Replace up to 1/3 of oldest trucks with trucks meeting 2010 standards by 2014
- One element focuses on short haul fleets traveling in South Coast and San Joaquin Valley
- Supplements Statewide In-Use Private Heavy-Duty Diesel Truck Fleet



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Expanded On- Road Truck Fleet Modernization Program

**Emission reductions of the SIP
concept for Expanded On-
Road Truck Fleet
Modernization Program in the
South Coast in 2015**

- **39 tpd NOx**
- **3 tpd ROG**



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Truck Emissions Tracking and Inspection Program

- Address deterioration, tampering, and mal-maintenance emissions from newer engines
- Track effectiveness of new diesel emissions control technologies



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Truck Emissions Tracking and Inspection Program (continued)

- **Expand Heavy-Duty Vehicle Inspection Program (HDVIP) to include visual inspection of emission controls, and check on-board computer**
- **Possibly use remote sensing to screen trucks for roadside inspections**



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Truck Emissions Tracking and Inspection Program

Emission reductions of the SIP
concept for Truck Emissions
Tracking and Inspection
Program in the South Coast in
2015

- 11 tpd NO_x
- 2 tpd ROG



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On-Road Trucks

**Emission reductions of the two
SIP concepts in the South
Coast for on-road trucks, in
2015**

- **51 tpd NO_x**
- **3 tpd ROG**



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Off-Road Equipment



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Off-Road Equipment

**Baseline emissions in the
South Coast for off-road
equipment, in 2015**

- **53 tpd NO_x**
- **6 tpd ROG**



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Off-Road Equipment

- **Two concepts proposed**
 - **Fleet averages /
fleet modernization**
 - **Idling restrictions**



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Off-Road In-Use Mobile Diesel Equipment Rule

- A statewide Off-Road In-Use Mobile Diesel Equipment rule currently under development
- Replacement, repower, retrofit
- Includes idling restrictions
- Board hearing scheduled for early-2007



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**Off-Road
Diesel
Equipment -
Fleet
Averages /
Fleet
Modernization**

- **Additional future reductions may be necessary**
- **May include replacing Tier 0 engines with Tier 3 or cleaner engines by 2014**



Off-Road Equipment - Idling Restrictions

- Reduce amount of non-necessary idling
- May include additional equipment (gasoline) not covered Off-Road In-Use Mobile Diesel Equipment Rule



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Off-Road Equipment

**Emission reductions of SIP
concepts in the South Coast
for off-road equipment, in 2015**

- **15 tpd NO_x**
- **2 tpd ROG**



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Locomotive Engines



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Locomotive Engines

**Baseline emissions of
locomotive engines in the
South Coast for off-road
equipment, in 2015**

- **24 tpd NO_x**
- **2.5 tpd ROG**



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Locomotive Engines

- **Two concepts proposed**
 - **Accelerated engine replacement for line haul locomotives**
 - **Cleaner switcher locomotives**



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Line Haul Locomotive Engines

- U. S. EPA will adopt enabling standards
- MOU or other mechanism to concentrate Tier 3 engines
- Replace existing with Tier 3 (10% per year) beginning in 2012
- Concurrently rebuild other engines to Tier 2.5 (5% per year)
- All engines meet Tier 3 by 2021



Line Haul Locomotive Engines (continued)

- **Alternative accelerated replacement strategy for line haul locomotives might be:**
 - **Replace existing with Tier 3 (20% per year) beginning in 2012**
 - **No rebuild program**
 - **Accelerated NOx reductions in early years**



Line Haul Locomotive Engines

**Emission reductions of the SIP
concept for Line Haul
Locomotive Engines in the
South Coast in 2015**

- **8.0 tpd NO_x**
- **1.0 tpd ROG**



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Switcher Locomotives

- **Replace existing switcher locomotives with lower emitting new technology**
- **Fleet turnover by 2010**



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Switcher Locomotives

**Emission reductions of the SIP
concept for switcher
locomotives in the South
Coast in 2015**

- **1.9 tpd NO_x**
- **0.3 tpd ROG**



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Locomotive Engines

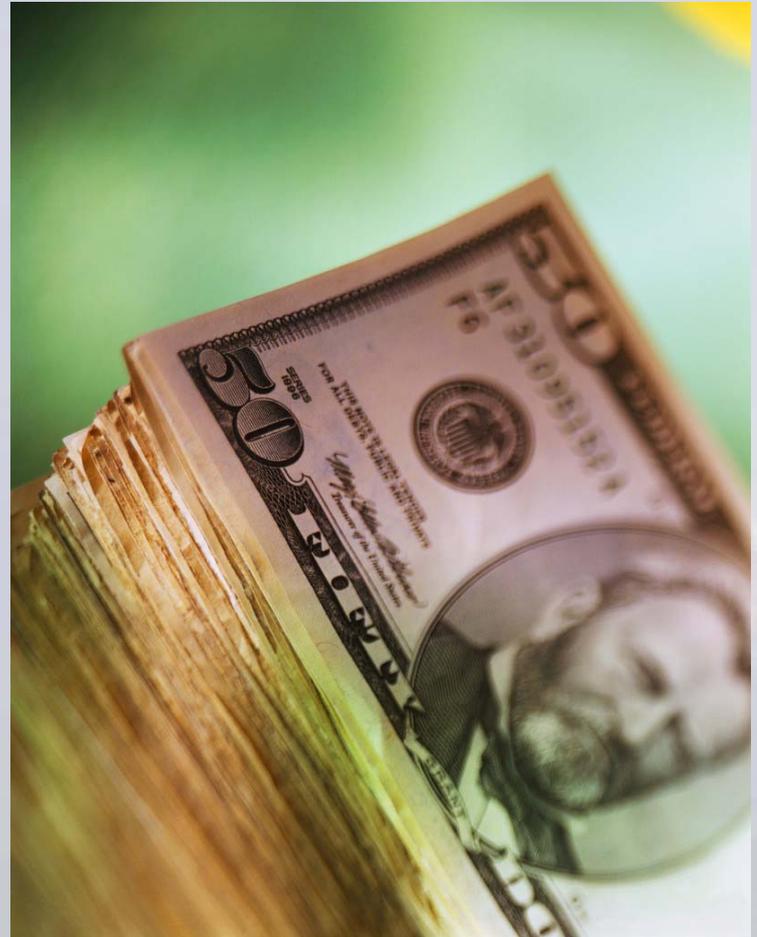
**Emission reductions of SIP
concepts in the South Coast
for locomotive engines, in 2015**

- **10 tpd NO_x**
- **1.3 tpd ROG**



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Financial Incentives



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Financial Incentives Need to Get Additional Emission Reductions

- **Incentive projects must be real, quantifiable, enforceable, and surplus**
- **Cannot pay for compliance with existing regulations**
- **Diesel engine projects include cleaner engines, repowers, and retrofits**
- **May be important consideration for some categories**



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