



# **South Coast AQMD Off-road Emission Reduction Technology Forum & Roundtable Discussion**

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Science & Technology Advancement



# Goals for the Forum and Roundtable

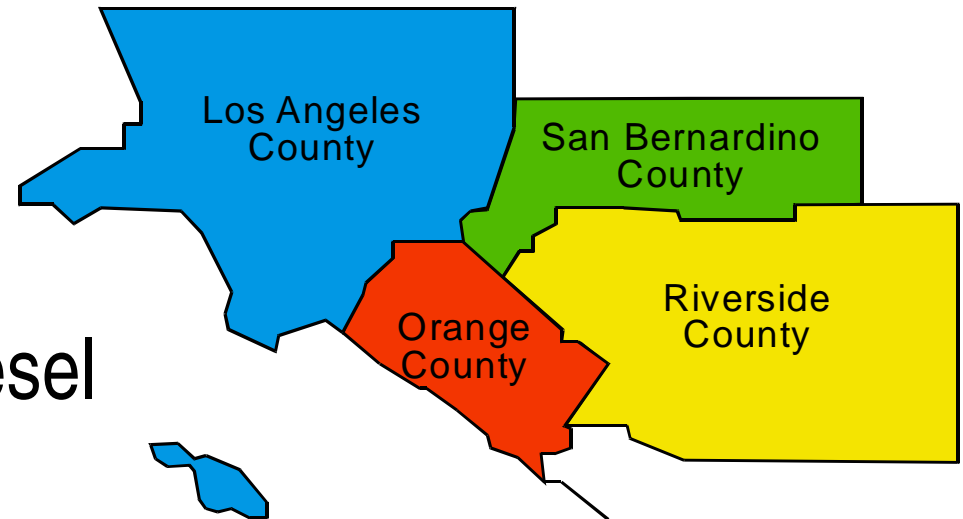
- Existing off-road diesel vehicles
  - Over 180,000 vehicles (CARB)
  - Emit ~ 386 tpd NOx & 23 tpd PM
  - Over 50% are construction equipment
  - State and federal activities
- Objective includes assessing the:
  - Status, costs, & challenges of SCR/DPF technology
  - CARB's proposed rule, showcase, & retrofit verification programs
  - Initiate dialogue for future actions



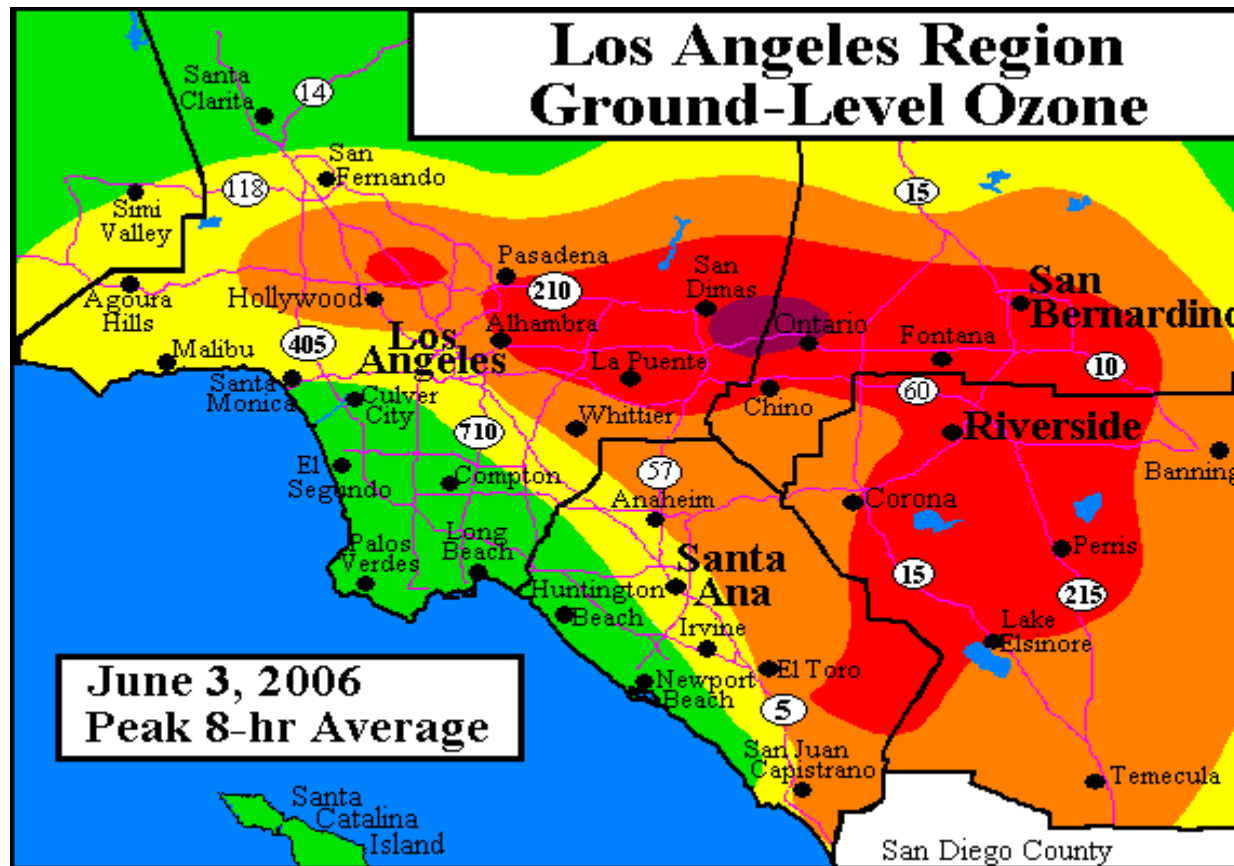
# AQMD Background Setting

## South Coast Basin:

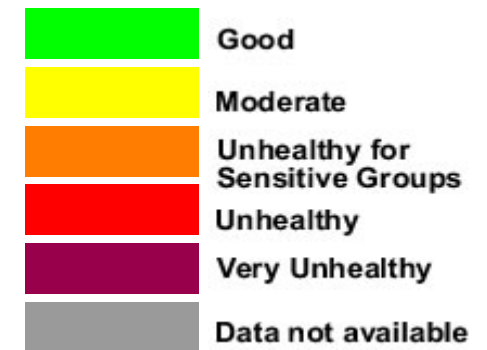
- 4-county region
- 11,000 sq. miles
- 16+ million residents
- Hundreds of thousands diesel vehicles
- Millions of gasoline vehicles
- Combined Ports of Long Beach and Los Angeles are nation's largest cargo gateway



# SCAQMD has the Worst Air Quality in the Nation



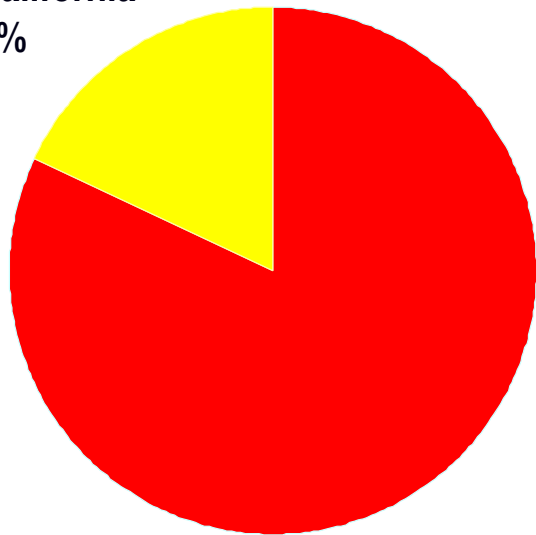
Los Angeles Region  
June 3, 2006



# PM2.5 Disproportionate Exposure South Coast Air Basin

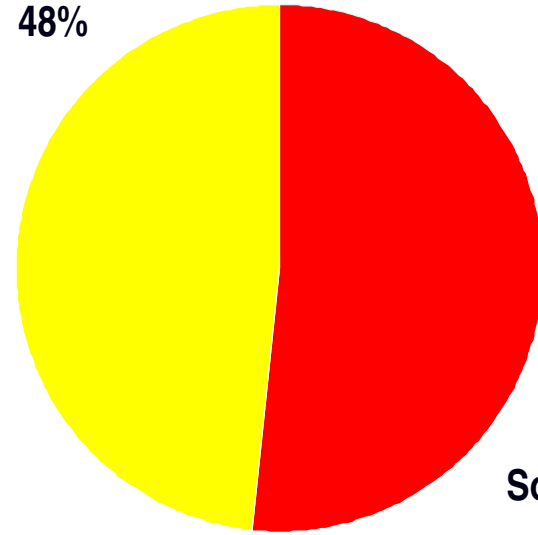
Population-Weighted Exposure Above NAAQS Based on  
2000-2002 AIRS Data

Rest of California  
18%



South Coast  
82%

Rest of Nation  
48%



South Coast  
52%



# Recent CARB Assessment of PM Health Effects



## SCAB Cases/Year due to PM2.5 \*

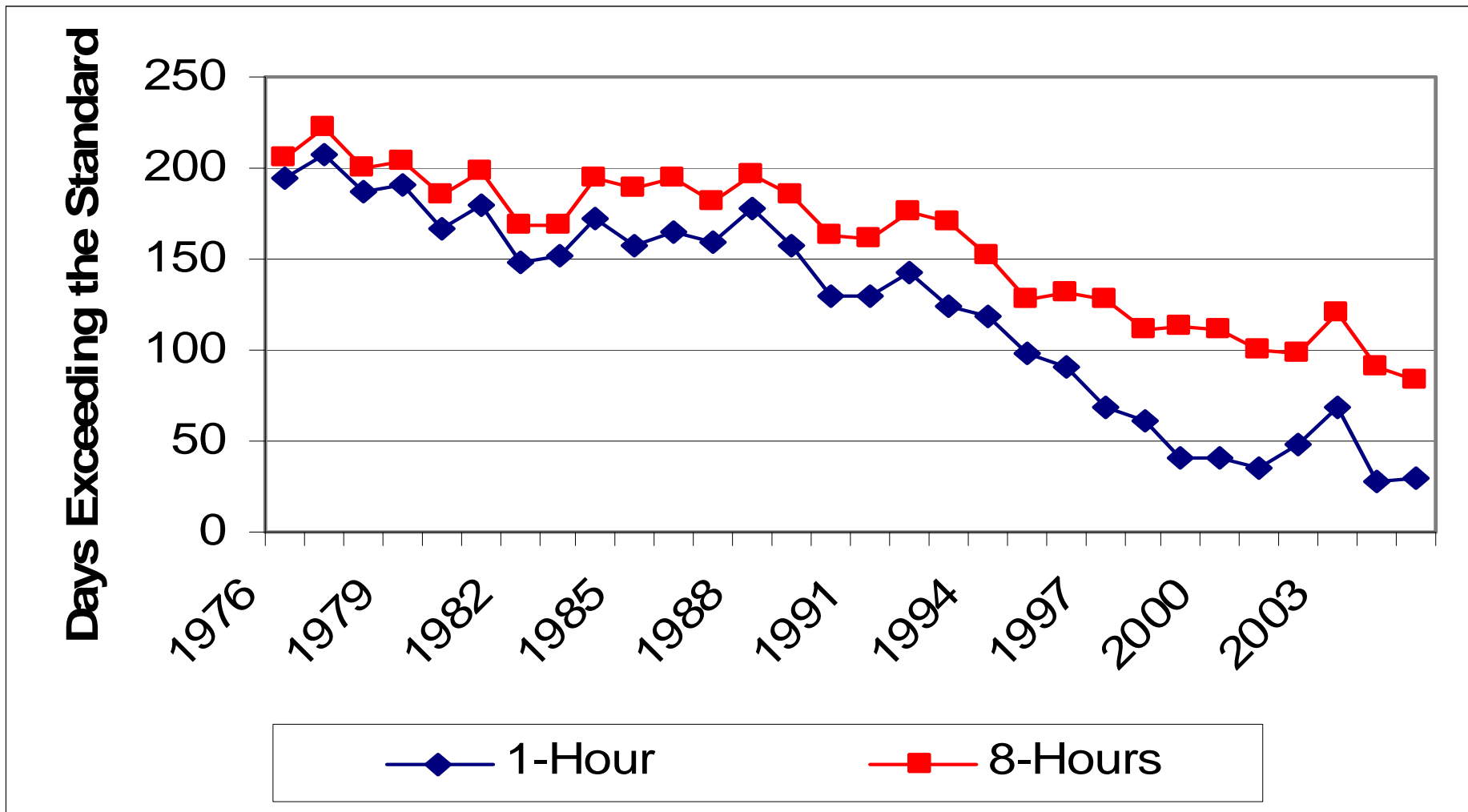
Premature Deaths	5,400
Hospitalizations	2,400
Asthma & Lower Respiratory Symptoms	140,000
Lost Work Days	980,000
Minor Restricted Activity Days	5,000,000

- 1999-2000 Air Quality Data Source: CARB

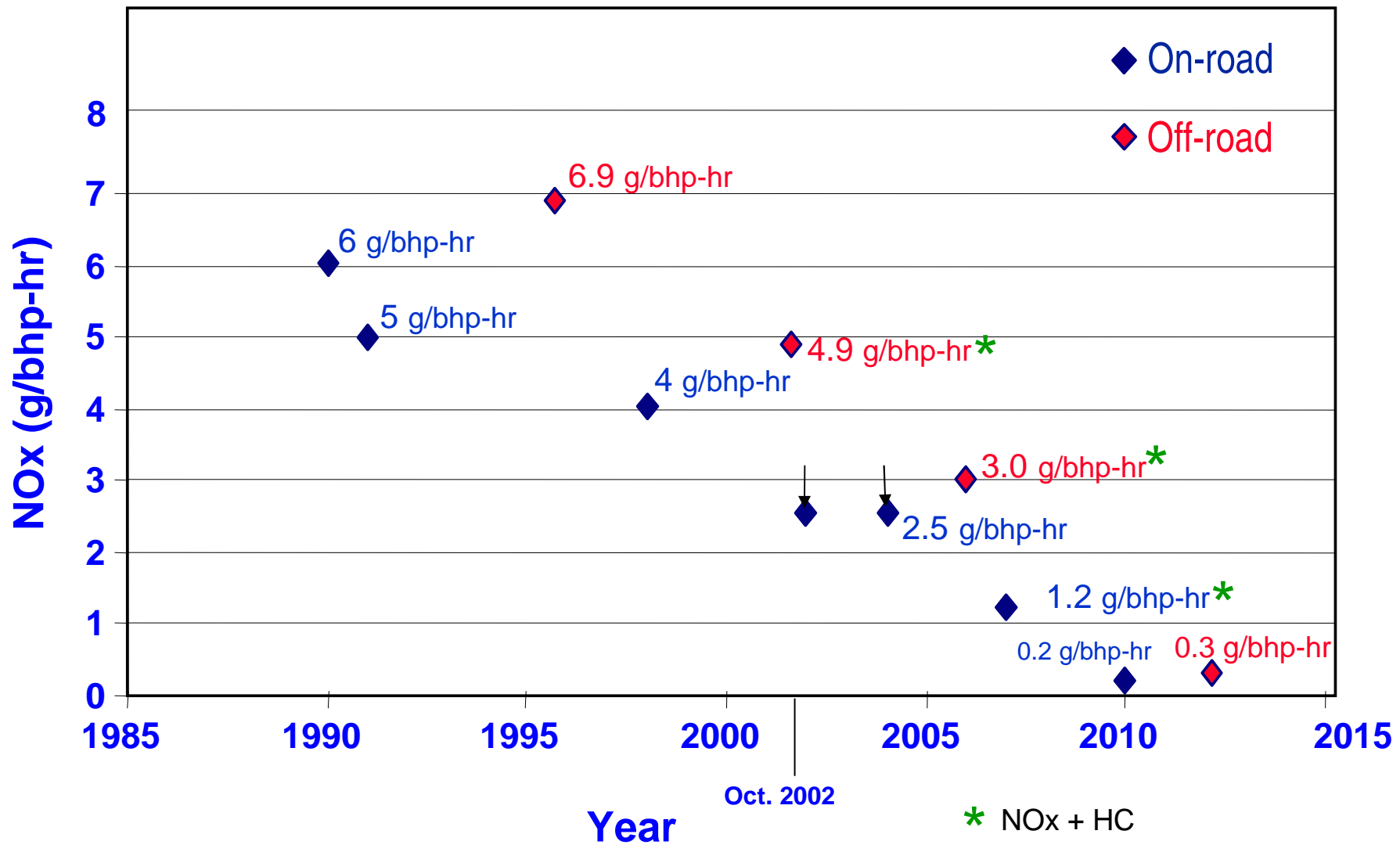


# Air Quality Trend

## Days Exceeding Ozone Standards



# On-Road/Off-Road HD Engine NOx Standards





# Challenge & Potential Strategy

- Emissions reduction are needed for attainment
  - NOx: 203 t/d (31%)
  - PM2.5: 14 t/d (14%) (2014)
- Number of older sources ↑
- Delayed mobile source control for off-road
- Emissions control strategy
  - Selective catalytic reduction
  - Diesel particulate filters
  - Other potential NOX/PM add-on devices



# South Coast AQMD Staff's Evaluation of CARB's Proposed Rule

- Substantial Number of Tier 0 and 1 Equipment Remaining in 2014
- Proposed PM Reductions Reasonable
- Potential Additional NO<sub>x</sub> Reductions Feasible by 2014



# South Coast AQMD Staff Proposal

- More Stringent Requirements for Large Fleet with over 40% Tier 0 and 1 Equipment
  - Accelerate NOx Fleet Average by 4 years for engines >175 hp
  - Increase Turnover Rate
    - 15% per year (2009 to 2014)
    - 10% per year (2015+)
- New Purchases and Repowers to Tier III or Better



# Rationale for South Coast AQMD Staff Proposal

- Focus on Large Fleet with Ability to Absorb or Pass On the Cost (per Staff Report)
- Commercial Availability of Tier 3 equipment (2006+)
- NOx Retrofit Technologies Becoming Available
  - Tier 2 to 3 (2007-08)
  - Tier 1, 2, 3 to 4 (2007-2010)



# Emission Reductions and Cost (South Coast, 2015)

<u># of Equipment</u>	<u>Total</u>
Tier 0	4,612
Tier 1	<u>15,949</u>
Total	20,561
NOx Emission Reductions (tpd)	
Tier 0	3.9
Tier 1	12.2
Cost (\$MM)	\$288-549



# Early Actions

- Joint SCAQMD / MSRC / CARB Showcase (2007)
- SCR Retrofit Technology Roundtable (May 1, 2007)
- Moyer Funding for Tier 3 or Cleaner Engines (ongoing)



# Summary

- Reductions from Off-Road Diesel Equipment Essential for Attainment
- South Coast AQMD Staff Proposal
  - Additional NO<sub>x</sub> Reductions Beyond CARB's Current Proposal Achievable
  - Focus on Large Fleets with the Oldest Equipment and Greatest Emission Reduction Potential
  - Enhances CARB's Current Proposal to Cleanup the Oldest, Dirtiest Equipment
  - Relies Primarily on Commercial Availability for Replacements (<175 hp); Repower/Retrofits (>175 hp)

