California Transit Bus Trends

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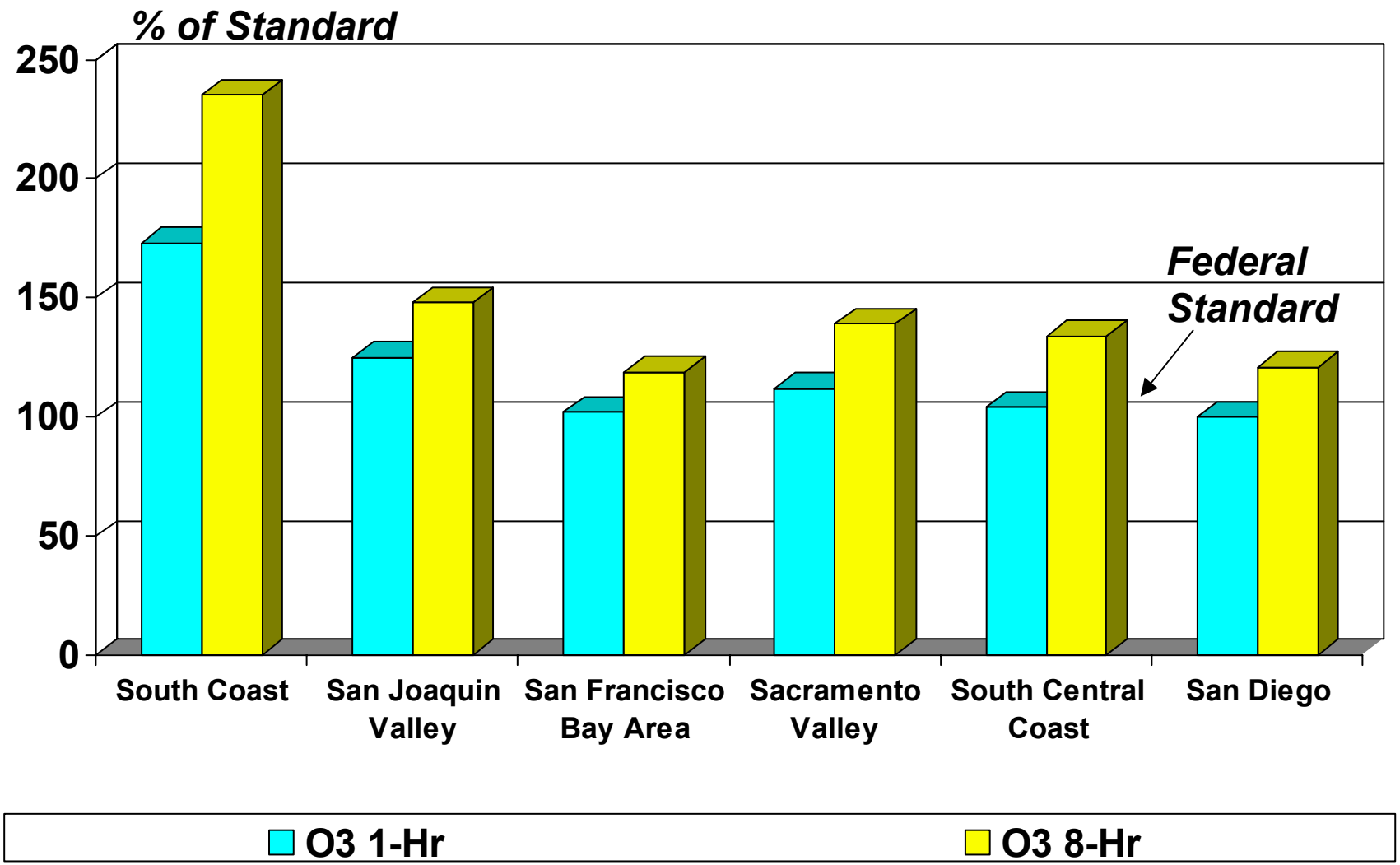
Transit Trends
10th National Clean Cities Conference
Ft. Lauderdale, FL
May 4, 2004

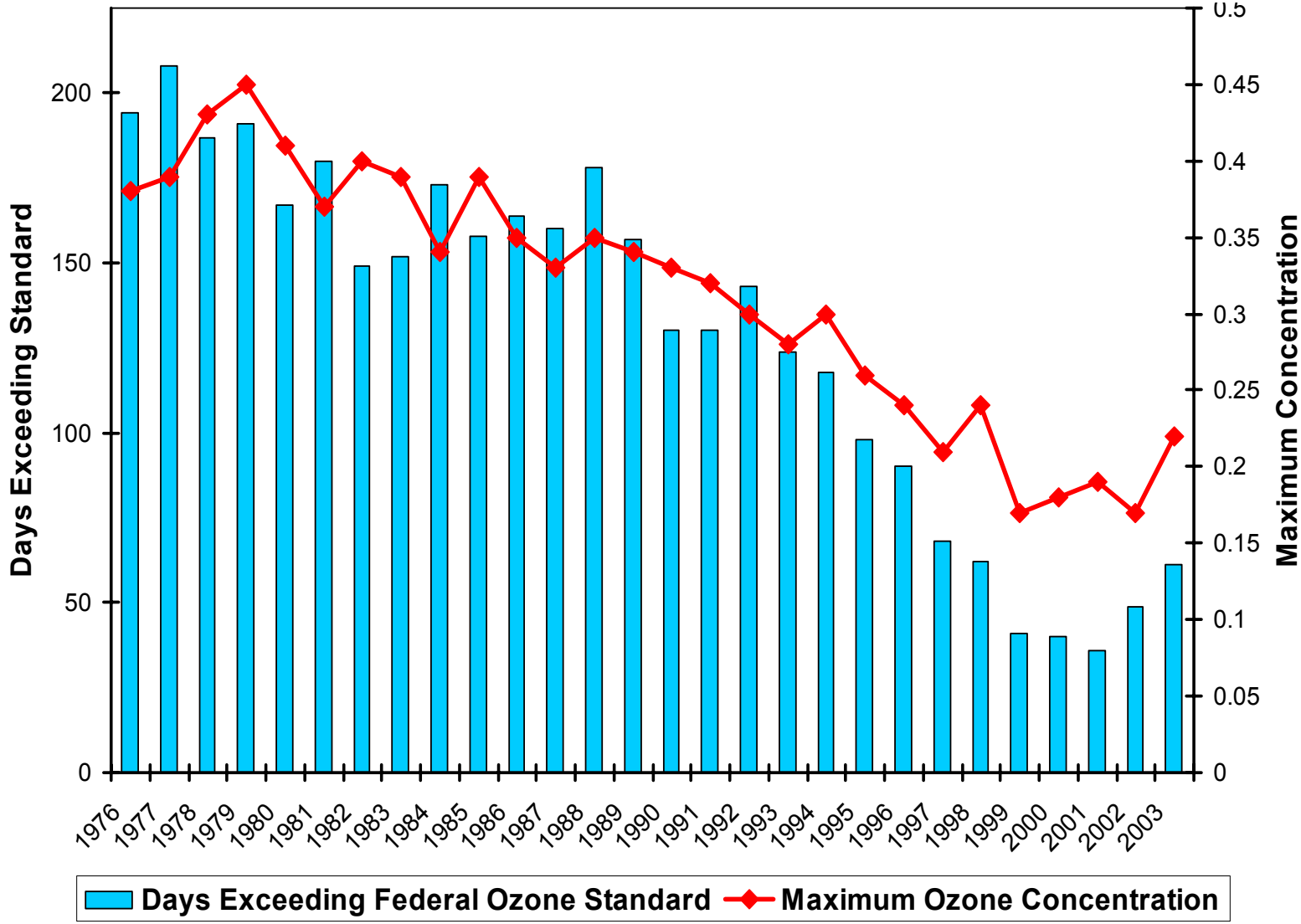
Overview

- Air Quality Concerns
- Incentive Programs
- Regulatory Programs
- Transit Bus Trends
- The Future

Ozone Air Quality in California



Southern California Air Quality Trends



Constraints in Achieving Standards

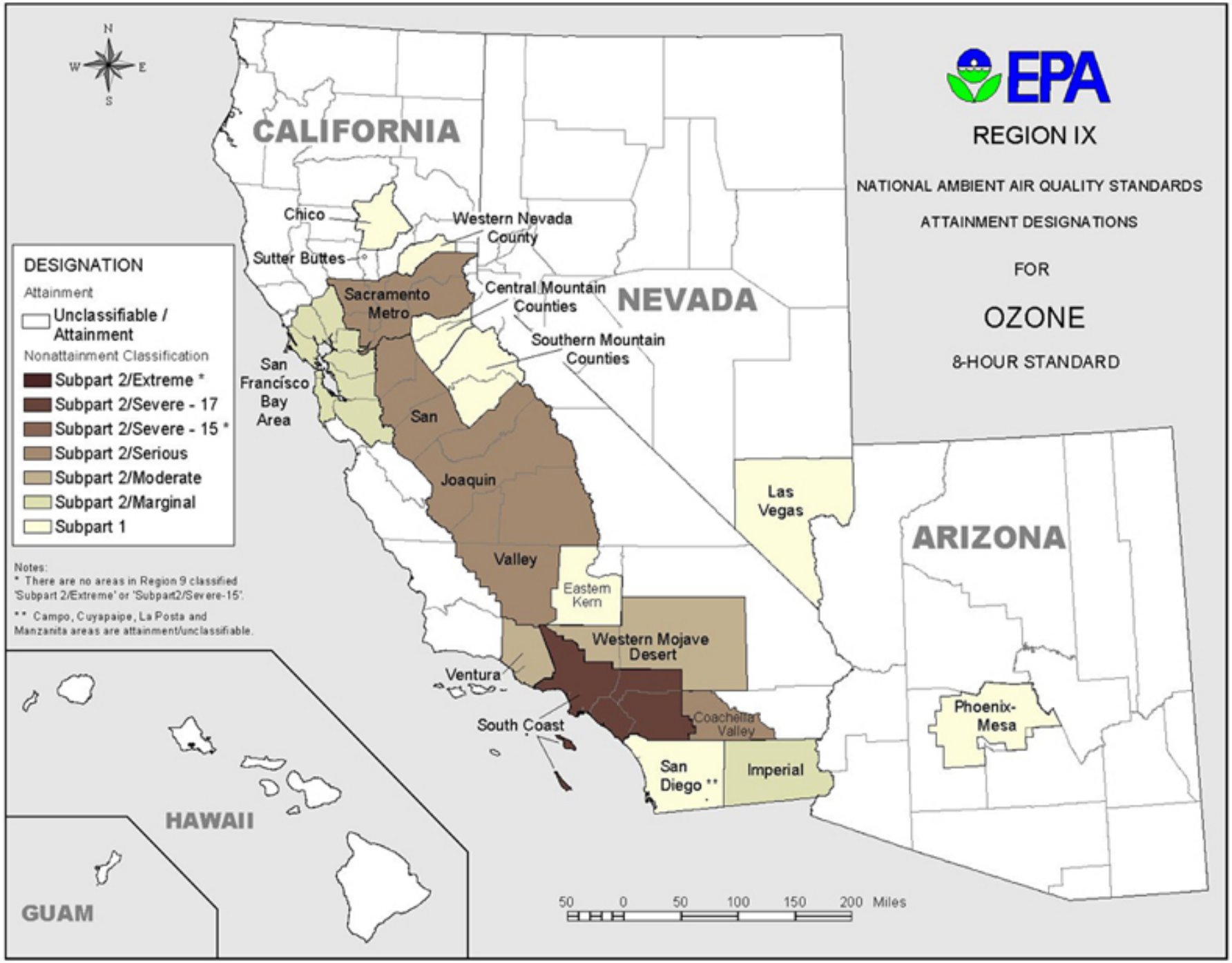
South Coast Air Basin

- Increasing Population, Vehicles, VMT
  - ↑15% in Population (17 mil. in 2010)
  - ↑34% in Number of Vehicles (11 mil. in 2010)
  - ↑31% in VMT (387 mil. in 2010)

- Expanding Economy
  - Consumer Products
  - Ports / Airports / Trains
  - Industrial Sources

Challenges to Attainment / Reducing Air Toxics Levels

- Slow Turnover of Existing Gasoline Vehicles
- Long Life of Existing Diesel Engines
- Funding to Implement New Technologies
- Development of Future Control Measures to Meet New Federal/State Clean Air Goals
- International/National versus Local needs


EPA
REGION IX
NATIONAL AMBIENT AIR QUALITY STANDARDS
ATTAINMENT DESIGNATIONS
FOR
OZONE
8-HOUR STANDARD
N
W
E
S
CALIFORNIA
NEVADA
ARIZONA
HAWAII
GUAM
DESIGNATION
Attainment
Unclassifiable / Attainment
Nonattainment Classification
Subpart 2/Extreme *
Subpart 2/Severe - 17
Subpart 2/Severe - 15 *
Subpart 2/Serious
Subpart 2/Moderate
Subpart 2/Marginal
Subpart 1
Notes:
* There are no areas in Region 9 classified 'Subpart 2/Extreme' or 'Subpart2/Severe-15'.
** Campo, Cuyapaipe, La Posta and Manzanita areas are attainment/unclassifiable.
Chico
Western Nevada County
Sutter Buttes
Sacramento Metro
Central Mountain Counties
Southern Mountain Counties
San Francisco Bay Area
San Joaquin Valley
Las Vegas
Eastern Kern
Western Mojave Desert
Ventura
South Coast
Coachella Valley
San Diego **
Imperial
Phoenix-Mesa
50 0 50 100 150 200 Miles

Mobile Source Emissions and Air Quality

- New Cleaner Engines – One Part of Solution
- Need to Clean Up Existing Engines - Second Part of Solution
- Public Policy – Deploy the Cleanest Commercially Available Technologies As Early As Possible

Approaches to Reducing Transit Bus Emissions

- Economic Incentive Programs
- Regulatory Actions

Economic Incentive Programs

- FTA Funding – 80 to 90% of Cost
- Mobile Source Credits – South Coast
- State/Local Heavy-Duty Vehicle Programs (1998-2003)
  - Carl Moyer (1,186 Buses; $13.7 M)
  - MSRC (1,396 Buses; $37.6 M)

Regulatory Programs

Adopted 2000

- California Transit Bus Rule

- South Coast Transit Bus Fleet Rule

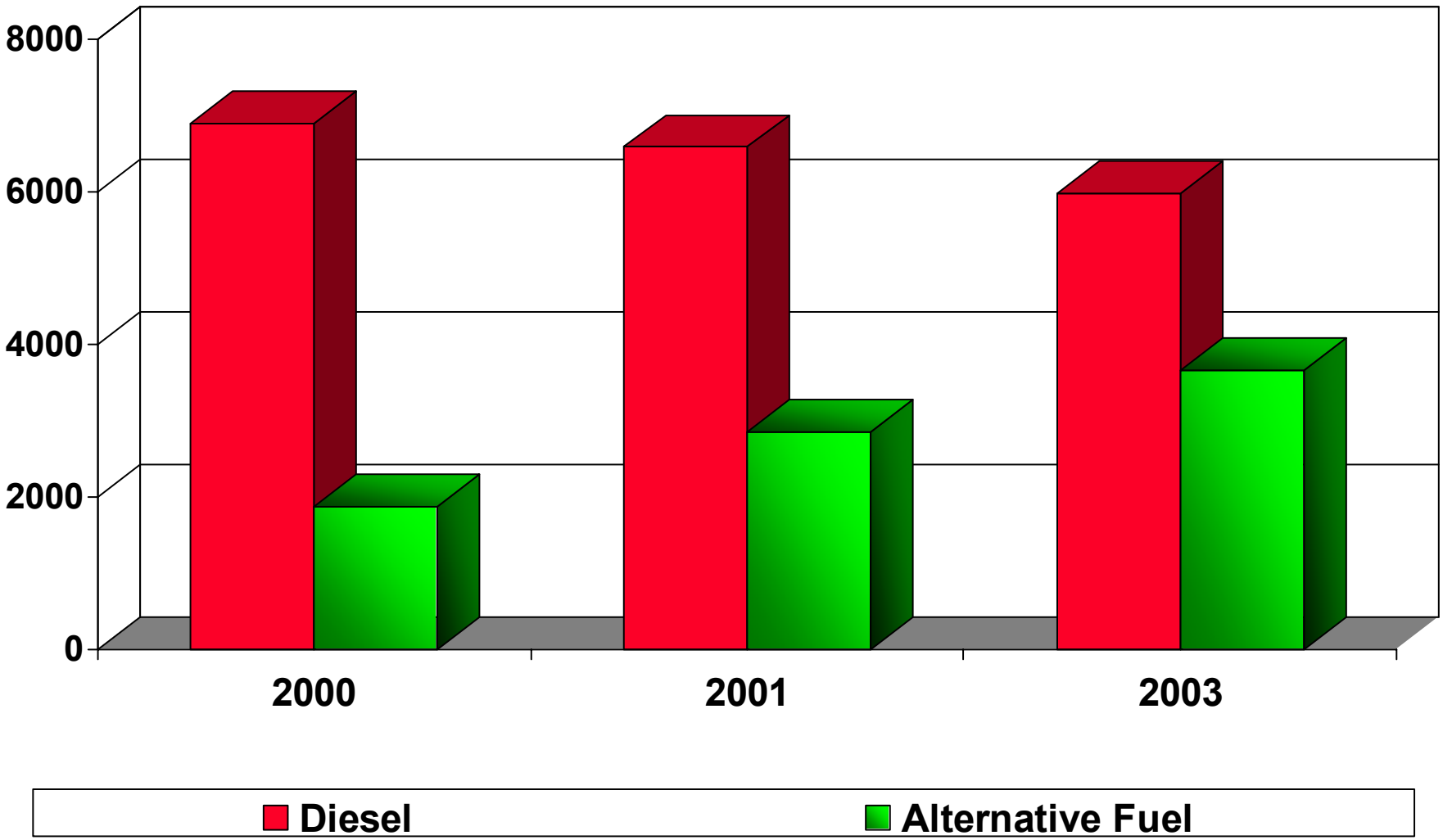
Regulatory Programs

- California Transit Bus Rule
  - Transit Properties to Choose Path: Alternative Fuel or Diesel
  - Diesel Requirements More Stringent In Order to Achieve Similar Reductions as Alternative Fuel Technologies
  - Eventual Introduction of Zero-Emission Buses

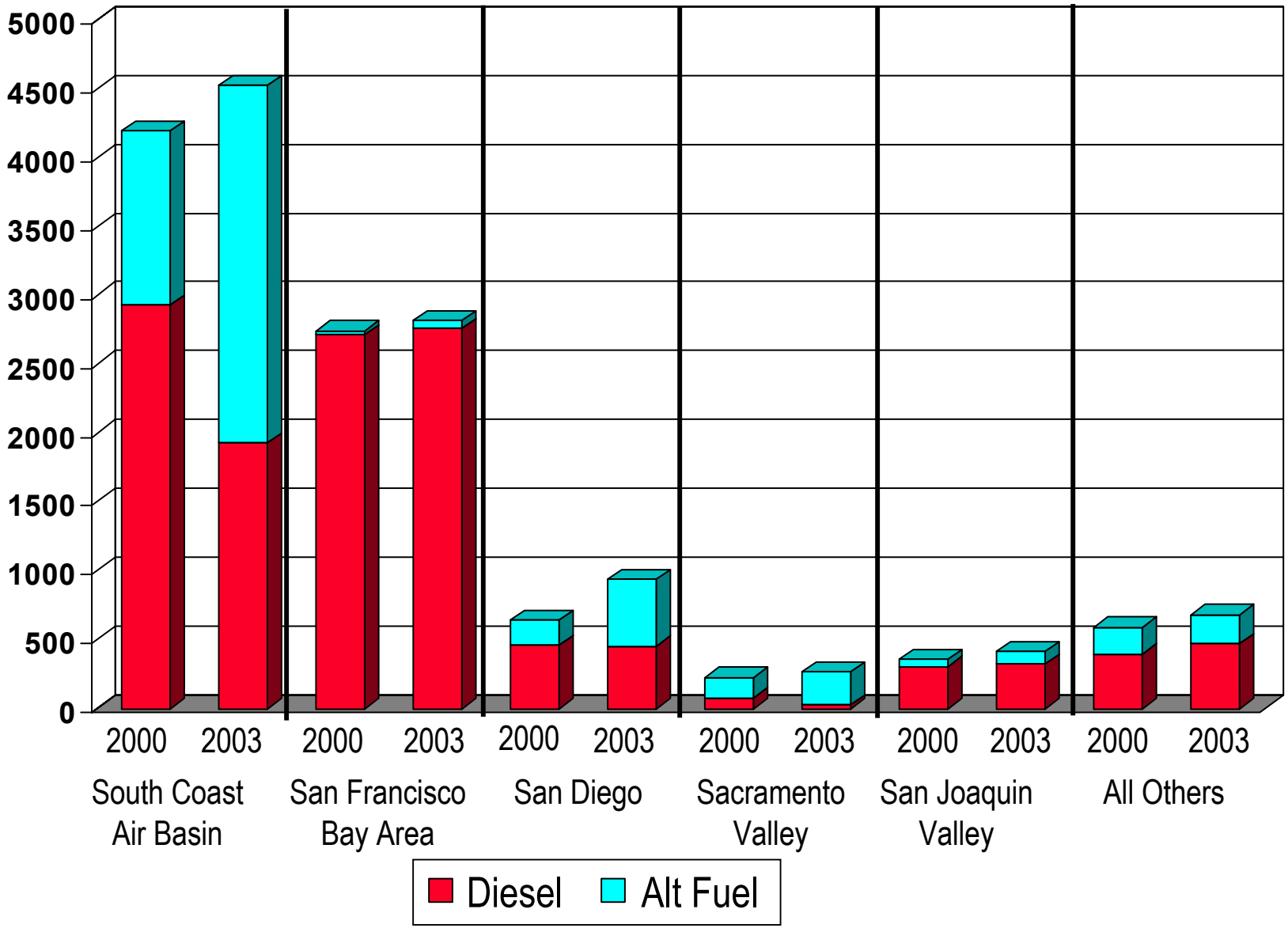
Regulatory Programs (continued)

- South Coast Fleet Rule
  - Similar to State Transit Bus Rule
  - Transit Properties Located in South Coast with 15 or More Buses Required to Purchase Alternative Fuel Buses
  - Large Transit Properties Chose Alternative Fuel Path
  - Smaller Transits Purchasing Alternative Fuel or Gasoline Hybrids

California Transit Bus Trends



Bus Trends by Region



Successes/Challenges

- Mixed Findings on Operational/Maintenance Costs versus Diesel
- Technology Issues Related Primarily to Vehicle Integration (Engine, Fuel System, Body Design)
- Need to Balance New Technology Deployment with Operational Needs
- Need for Full Commitment to Alternative Fuel Technology to be Successful

Why Choose Alternative Fuel Path?

- Alternative-Fueled Buses – Inherently Cleaner than Conventional Fueled Vehicles
- Alternative Fuel Technologies Continue to Improve Relative to Performance/Costs/ Environmental Benefits
- Reduces Foreign Dependency on Petroleum-Based Fuels

Current Certification Data for Heavy-Duty Diesel Engines

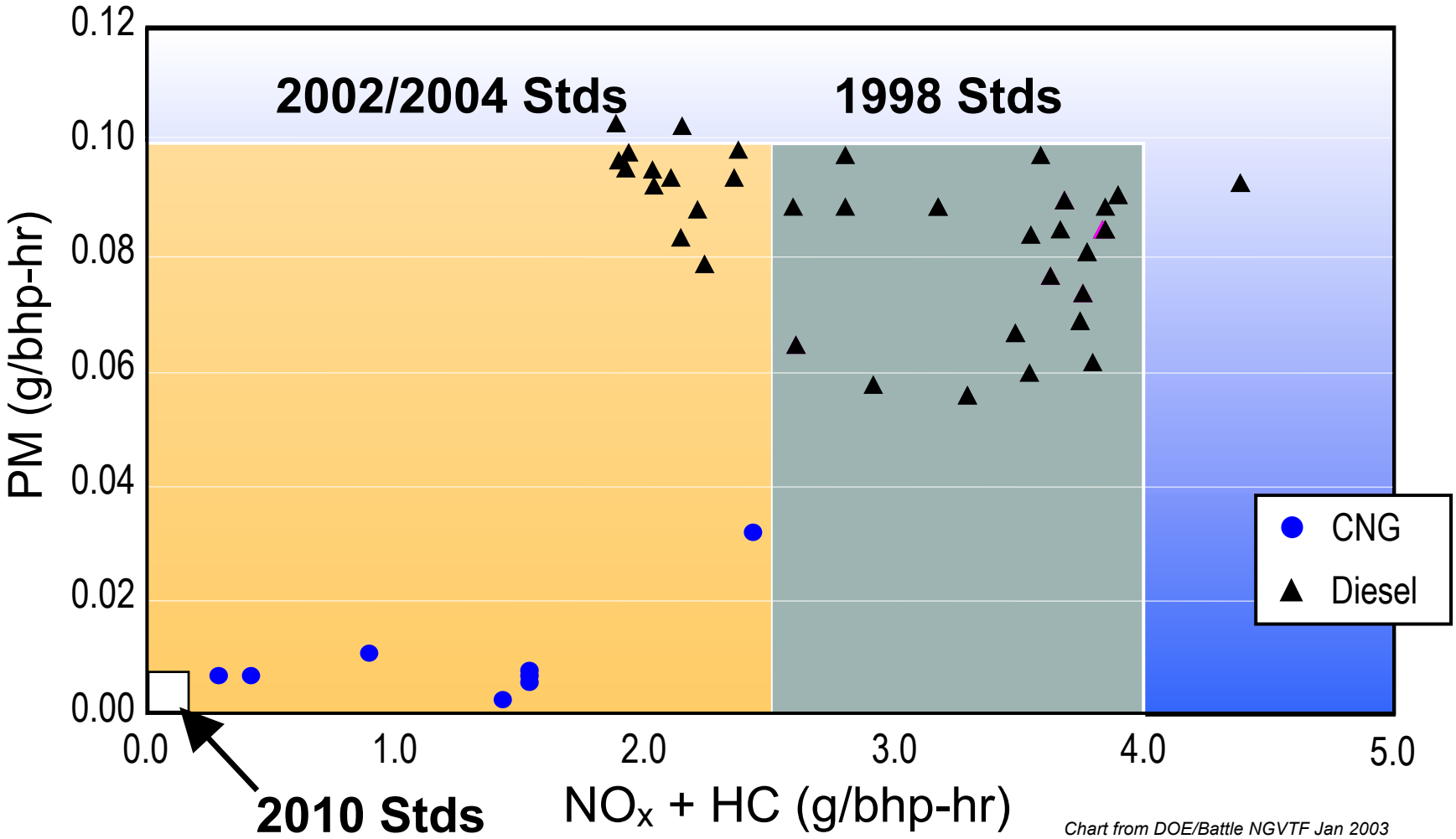
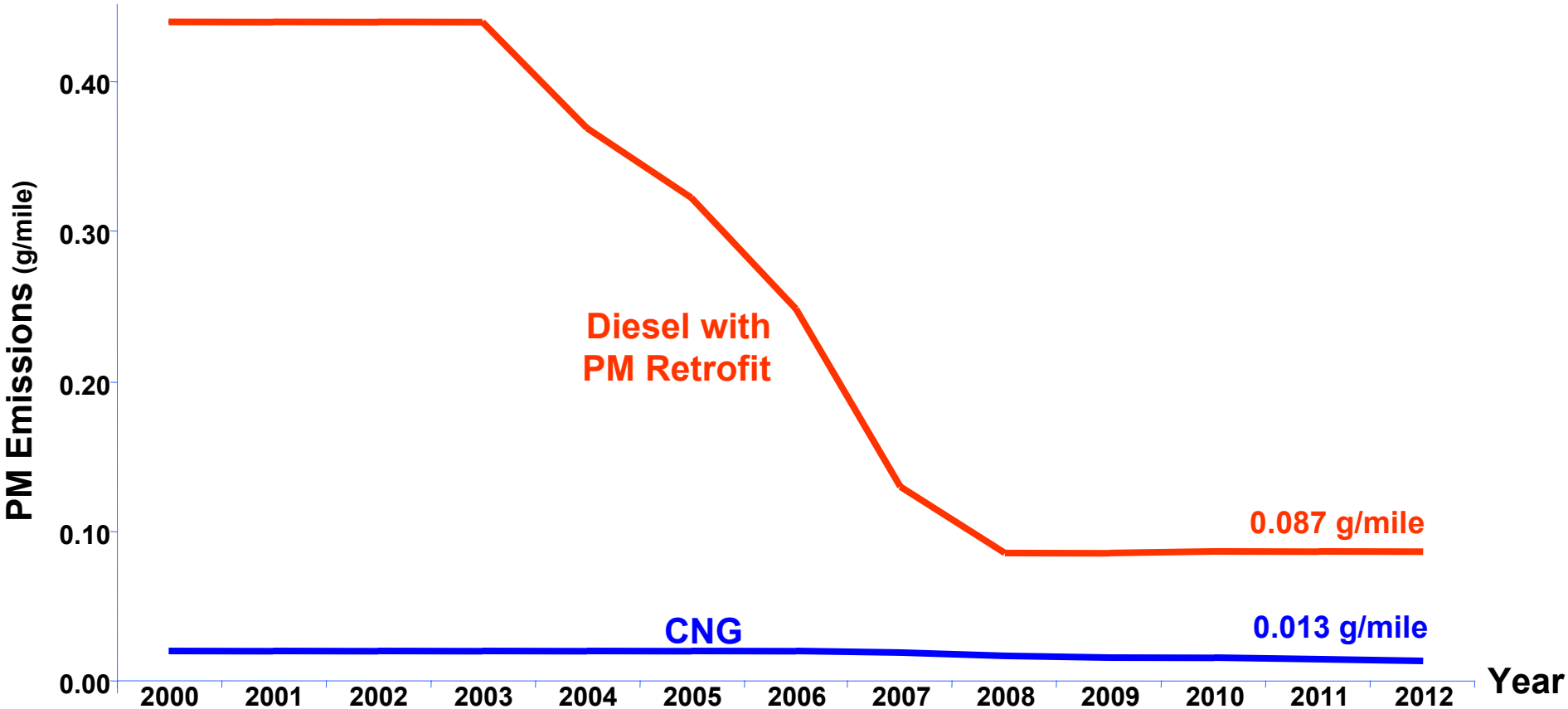


Chart from DOE/Battle NGVTF Jan 2003

Estimated In-Use PM Emissions - Bus Fleet Average



Source: California Air Resources Board (2000)

The Future

- Natural Gas Engine Manufacturers to Produce 0.2 gm/bhp-hr Engines by 2007
- Diesel Engines at 1.2 gm/bhp-hr in 2007
- Current Gasoline Hybrid Buses at 0.6 gm/bhp-hr
- Commercial Zero-Emission Buses
  - Electric – Available Today
  - Fuel Cell – Future Date Uncertain