

# **VOLUNTARY DIESEL RETROFIT PROGRAM**

## **Implementation Progress Update**

**Certification and Compliance Division**

**December 3, 2003**

# Program Description

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- A voluntary program designed to install pollution-reducing technology on existing diesel vehicles and equipment
- The program is building a market for clean diesel concepts
  - Accelerating the delivery of ULSD
  - Forging business partnerships and relationships
  - Investing EPA resources to accelerate market growth
- The program deals with existing engines today.
  - 2007 highway and proposed nonroad rules address only future engines
  - Existing diesel engines can last 20-35 years

# Status

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The Retrofit Program has been successful in the following areas:

- Verifying retrofit technologies (10 total)
- Increasing the number and type of retrofit projects throughout the U.S. by leveraging EPA resources
- Achieving significant emission reductions
  - ~160,000 Commitments: [~80,000 total tons (PM, NO<sub>x</sub>, HC, CO)]
  - ~75,000 Installations: [~42,000 total tons]
- Expanding ULSD availability to enable the use of advanced emission controls

# Technology Verifications

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- 10 technologies currently EPA-verified
  - DPFs, DOCs, Crankcase Filtration, Emulsified Fuel, Biodiesel, Cetane Enhancers
- Recent verification
  - Donaldson, DOC & Crankcase Control
  - Clean Diesel Technology, DOC & Fuel Borne Catalyst
  - Engine Control Systems (Lubrizol), DPF
- In process
  - Cleaire, Alliance Longview
  - Clean Clear Fuel Technology

# In-Use Feedback

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- Once a sales target is reached a manufacturer must establish an in-use testing program to maintain their initial verification
  - Manufacturer in-use testing to begin within next two months
  - Coordinating program rollout with CARB
- EPA/CARB/Manufacturer to develop test plans for each verified technology
- Target fleets in conjunction with OTAQ's in-use program

# FY03 Retrofit Program Funding

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- \$500K available for grant competition
- \$3.2 M requested by 39 applicants
- Applicants selected for funding:
  - Sacramento Air Quality Management District
  - New York State – Department of Transportation
  - Mount Rainier National Park (IAG)
  - City of Boston – Environment Department
  - Hamilton County (Cincinnati) – Department of Environmental Services
  - Maryland -- Department of the Environment
- \$300K (FY03-04) contract for first retrofit project with private company
  - FedEx Freight - Dallas, TX

# Retrofit Funding Sources

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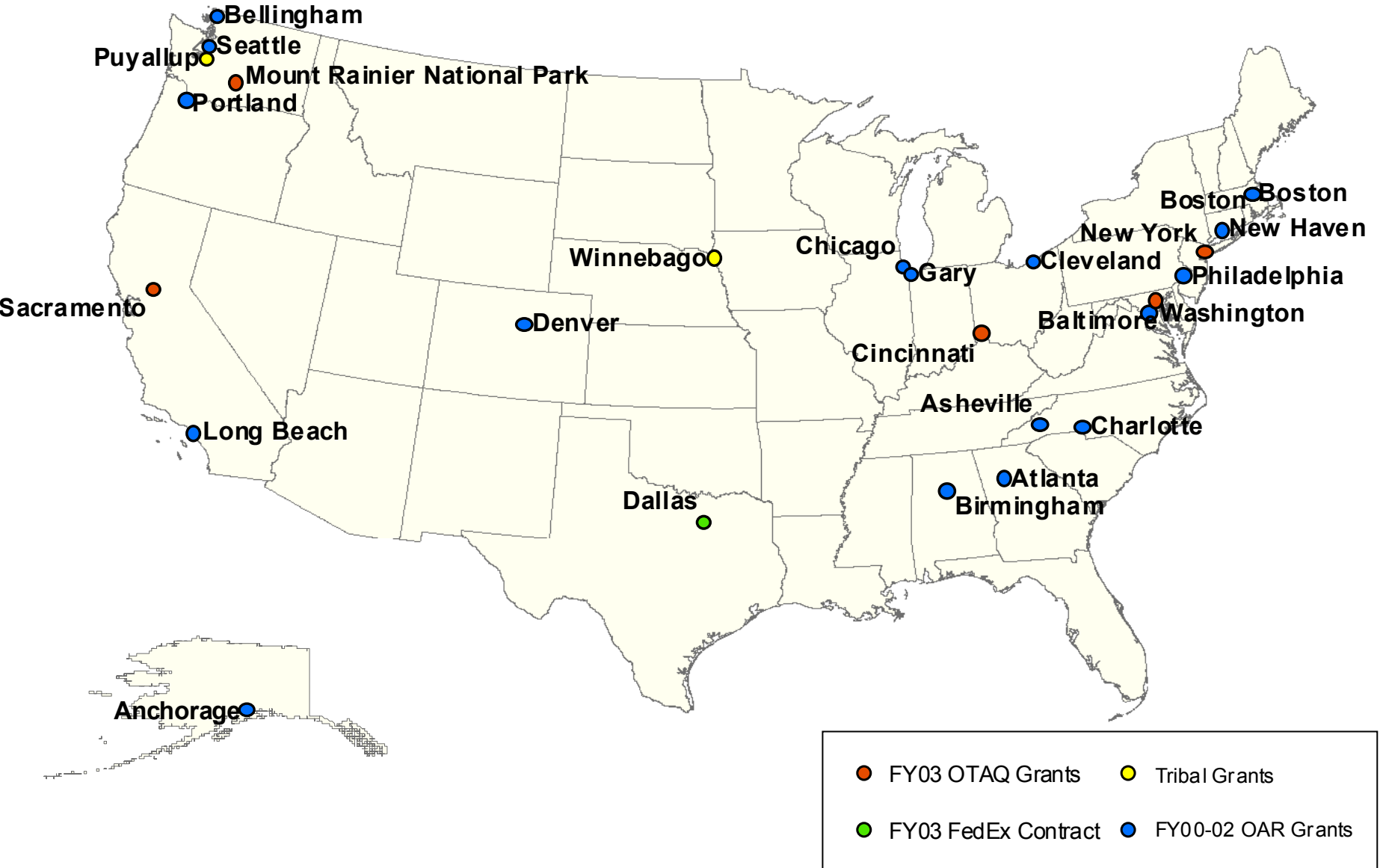
- Using OAR funding, we have been successful in leveraging additional resources

<u>Source</u>	<u>Investment</u>	<u># Retrofits</u>
OAR	\$2.4 Million*	~1,735
Market	\$450 Million (est.)	~158,000

\* OAR funds used to leverage matching funds.

- States are developing various funding mechanisms
  - Washington State - \$5M/yr for school bus retrofits over the next 5 yrs
  - New York - \$5M/yr for school bus retrofits
  - Texas - \$130M/yr for retrofits over the next 3 yrs
  - California – Carl Moyer Program
  - Georgia & Oregon have tax credits in place
- Approximately \$30M in SEPs for retrofit projects
  - Toyota, ADM, Alcoa, VEPCO, WMI, Chevron
- Energy Bill - \$300M under consideration

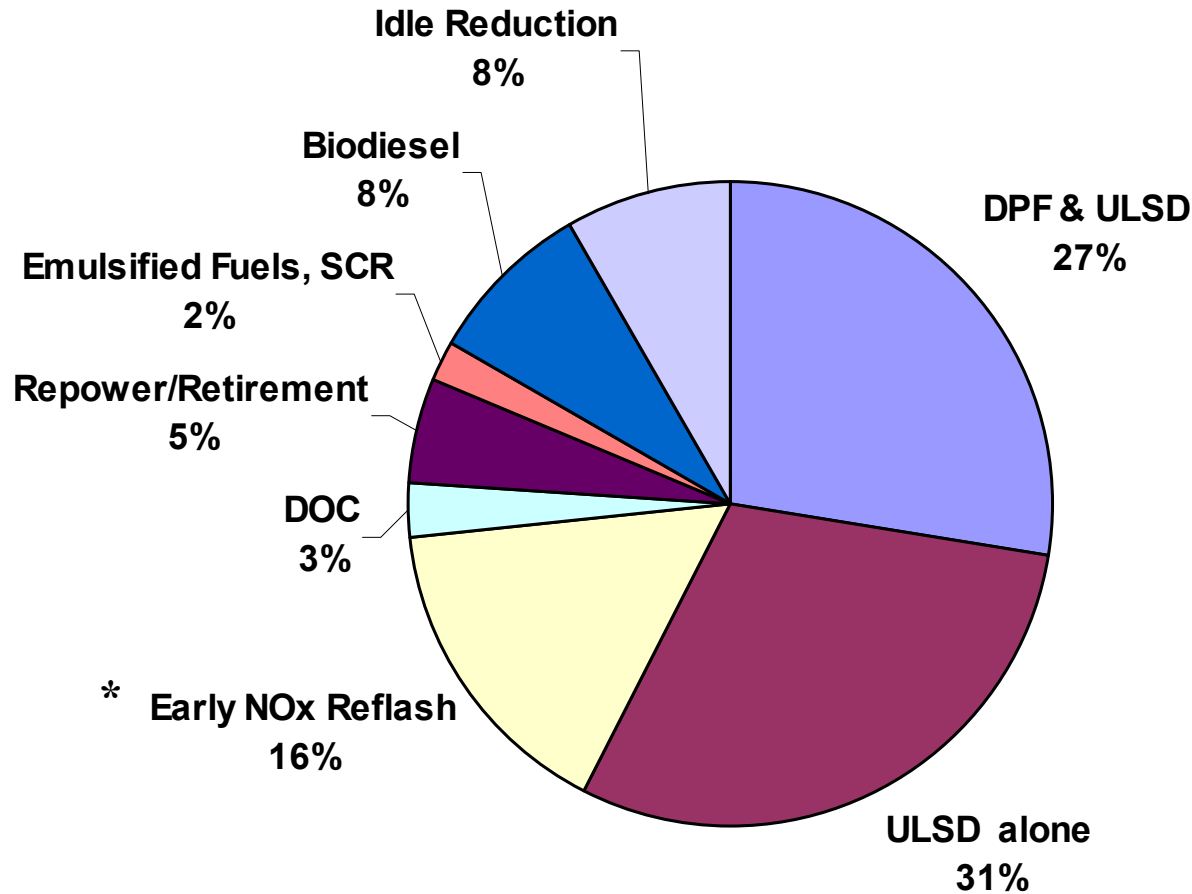
# OAR Funded Retrofit Projects





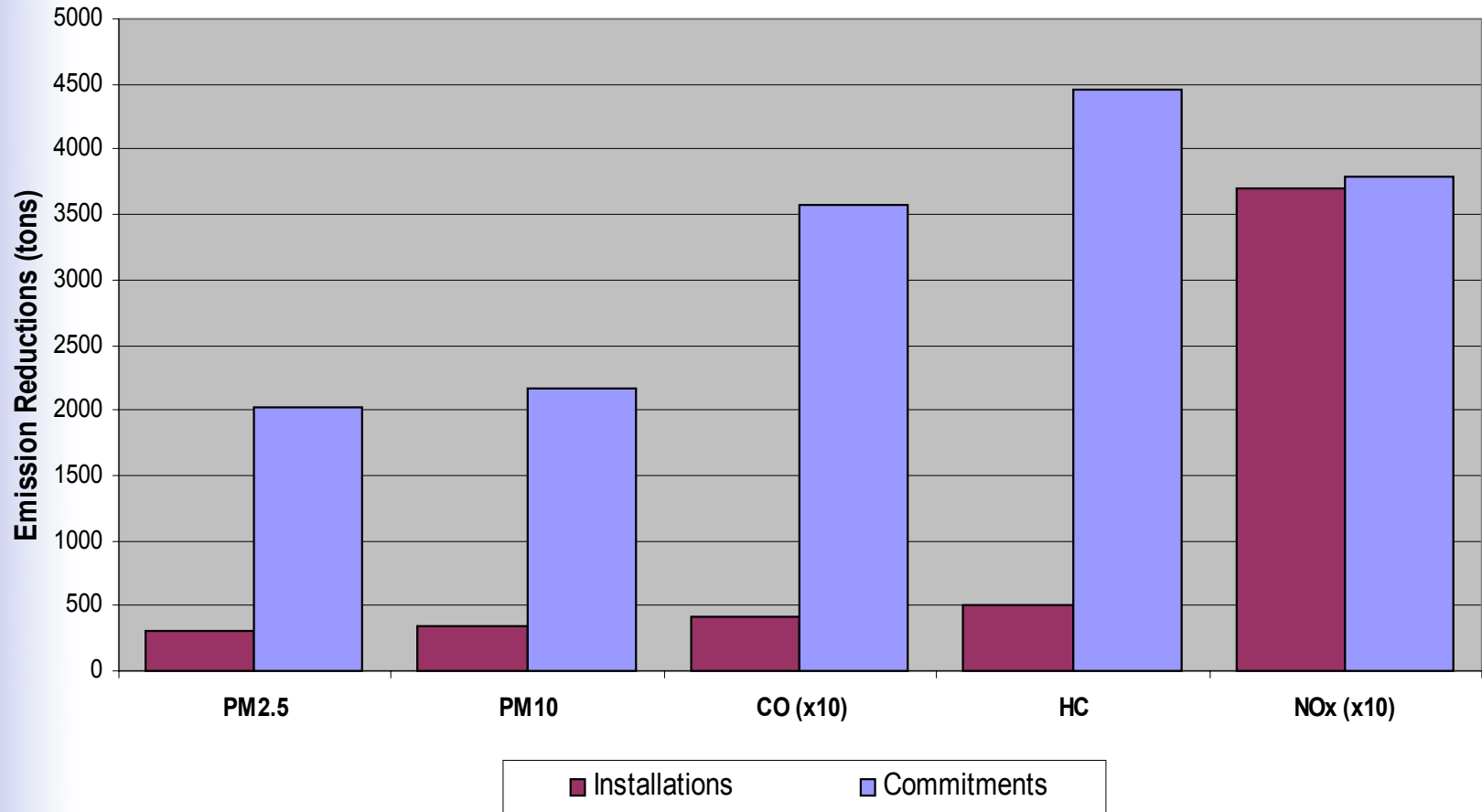
# Retrofit Commitments

- 160,000 Commitments (as of September 2003)



\* Performed prior to Consent Decree requirements.

# Emission Reductions



\* This chart excludes reductions from idle reduction strategies.

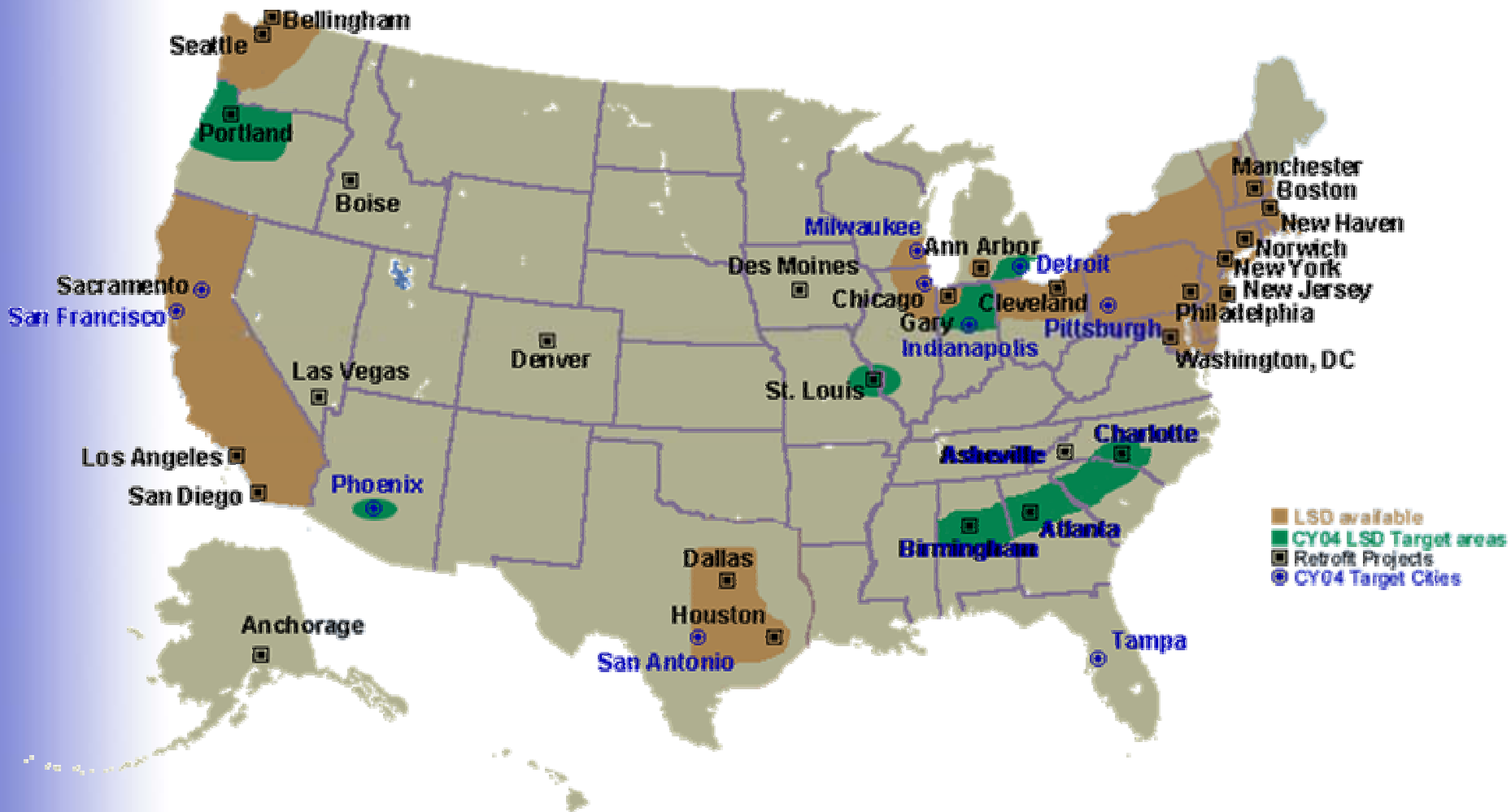
# The Role of ULSD

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- The foundation of many retrofit projects is the fuel supply
  - ULSD acts as the enabler of advanced retrofit technologies including DPFs and future NOx Adsorbers
  - Greater ULSD availability will allow targeting of high-polluting long-haul trucks
  - Generally, PM filter w/ULSD achieve PM reductions over 90%
- ULSD is becoming more widely available throughout the country
  - Several fuel companies can distribute ULSD today (BP, ConocoPhilips, Sunoco, Valero, Sprague)
  - Current ULSD usage is over 130 million gallons/year. In 2001, total on-highway diesel consumption was over 33 billion gallons/year.
  - Increasing availability assists implementation of 2007 Rule

# ULSD Availability

(Future Project and ULSD Expansion)



# FY04 Action Plan

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- Expedite implementation of retrofit commitments
- Expand the use of ULSD
- Provide technical assistance for new retrofit projects
- Evaluate emerging retrofit technologies for effectiveness on various engine applications
- Support international efforts in developing retrofit projects
- Evaluate opportunities for a new sector-based initiative
  - Nonroad (primarily construction equipment)
  - Commuter Rail Locomotive

# Retrofit Opportunities

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- Highway Trucks & Buses
  - Assuming 2 million engines (1995 and newer MY) in the fleet today are candidates for Diesel Particulate Filters (DPF) and ULSD
  - Application: Class 6-8 trucks, school & transit buses
  - Applying a DPF & ULSD to those engines could potentially yield significant lifetime emission reductions:
    - 70K tons  $PM_{2.5}$ , 260K tons HC, 1.1M tons CO
  - If all 2 million were retrofit, these reductions may prevent cumulatively (lifetime):
    - 1,900 premature deaths
    - 1,200 cases of chronic bronchitis
    - 1,200 hospital admissions
    - 350,000 work days lost

# Retrofit Opportunities

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- Nonroad Engines
  - Assuming 4 million engines (1990 and newer MY) in the fleet today are candidates for Diesel Oxidation Catalysts (DOC) and ULSD
  - Application: Construction & Ag equipment
  - Applying a DOC & ULSD to those engines yields significant emission reductions per year:
    - 20K tons PM<sub>2.5</sub>, 25K tons HC, 125K tons CO
  - If all 4 million were retrofit, the reductions may prevent annually:
    - 1,500 premature deaths
    - 900 cases of chronic bronchitis
    - 1,300 hospital admissions
    - 160,000 work days lost

# For Further Information...

- **Voluntary Diesel Retrofit Program**

- [www.epa.gov/otaq/retrofit](http://www.epa.gov/otaq/retrofit)

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