

# Voluntary Diesel Emission Reduction Programs

*Retrofit, CSB USA, Smartway Transport*

**OTC Meeting  
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# VOLUNTARY DIESEL RETROFIT PROGRAM





# What is the Voluntary Diesel Retrofit Program?

- 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 & Proposed Nonroad rules address only future engines
  - Existing diesel engines can last 20-35 years

# What is Retrofit Technology?

- Retrofit technology can be:

*any change to an engine system above and beyond what is required by EPA regulations that improves the engine's emission performance:*

- Catalyst or filter
  - Engine upgrade or engine re-flash
  - Use of early engine replacement
  - Cleaner fuels or additives
  - Idling control equipment
  - “Neofits”
  - Combination of above
- Program verifies the effectiveness of retrofit technology

# Retrofit Technology Effectiveness

**NVFEL Relative PM Emissions  
- Diesel PM Filter Enabled Reductions -**



"Typical" Test Filter  
0.1 g/bhp-hr



Trap Equipped  
Test Filter - NVFEL  
<< 0.01 g/bhp-hr

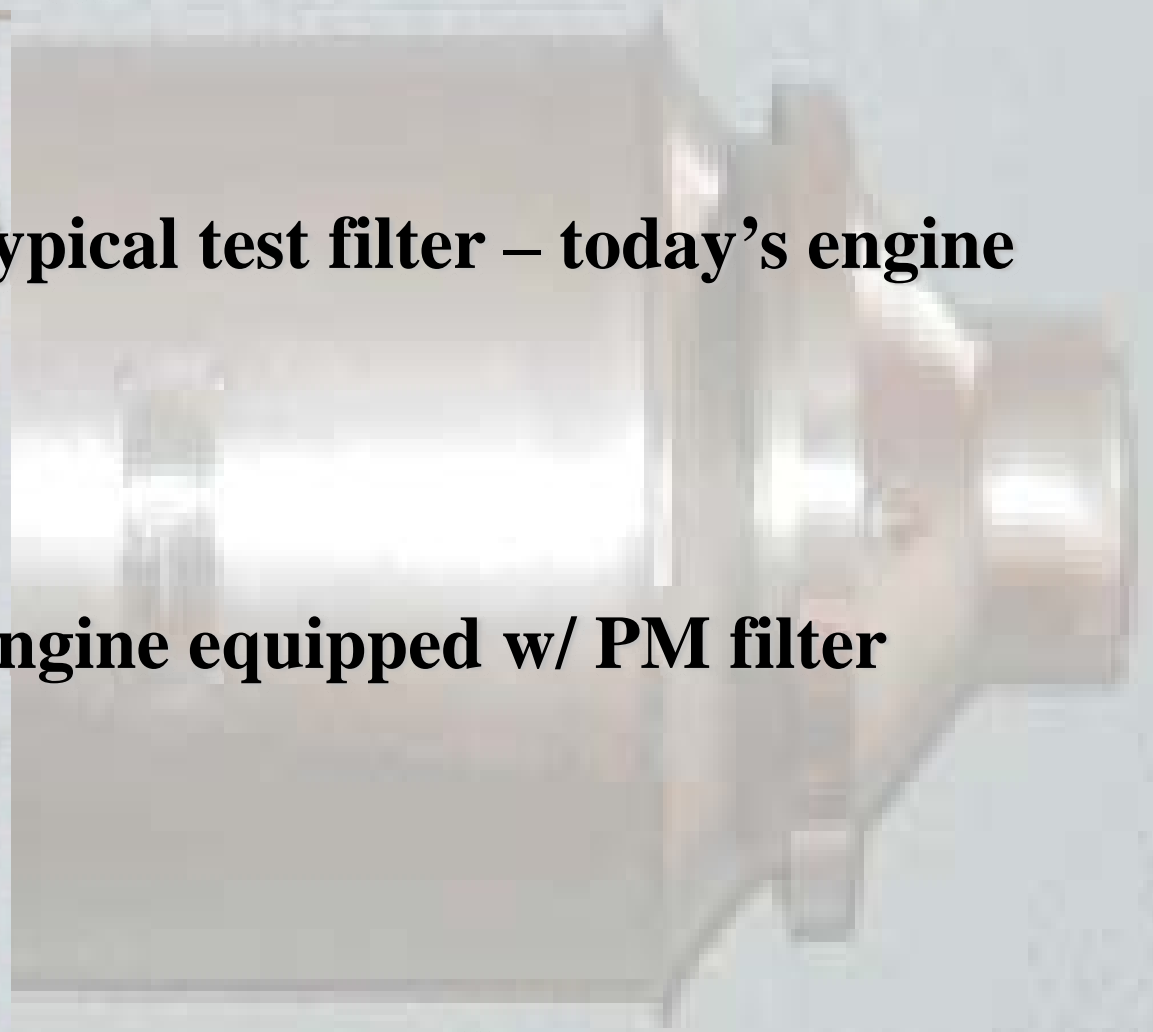


Unused Test Filter

**1. Typical test filter – today's engine**

**2. Engine equipped w/ PM filter**

**3. Brand new test filter - unused**





# Retrofit Technology Verification

- **Objective:** Evaluate the emission reduction effectiveness of retrofit technology
  - Verification provides stakeholders with confidence that these technologies will achieve quantifiable emission reductions
- Verification consists of the following:
  - Appropriate Testing Protocols
  - Statistical Sampling Methods
  - Durability Requirements

# Verified Technology

- 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, Fuel-Line Magnet



# In-Use Feedback

- Once a certain sales target is reached a manufacturer must establish an in-use testing program to maintain their initial verification
  - Manufacturer in-use testing to begin w/i 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
- WebSite: [www.epa.gov/otaq/retrofit/retroverifiedlist.htm](http://www.epa.gov/otaq/retrofit/retroverifiedlist.htm)



# The Role of Diesel Fuel

- The foundation of many retrofit projects will be the fuel supply
  - Many technologies require Ultra Low Sulfur Diesel (ULSD) Fuel
  - Some can operate on current fuel but can not achieve full emission reduction potential
  - Generally, PM filter with ULSD achieve PM reductions over 90%
- ULSD is becoming more widely available throughout the country
  - Several fuel companies can distribute ULSD today in specific regions

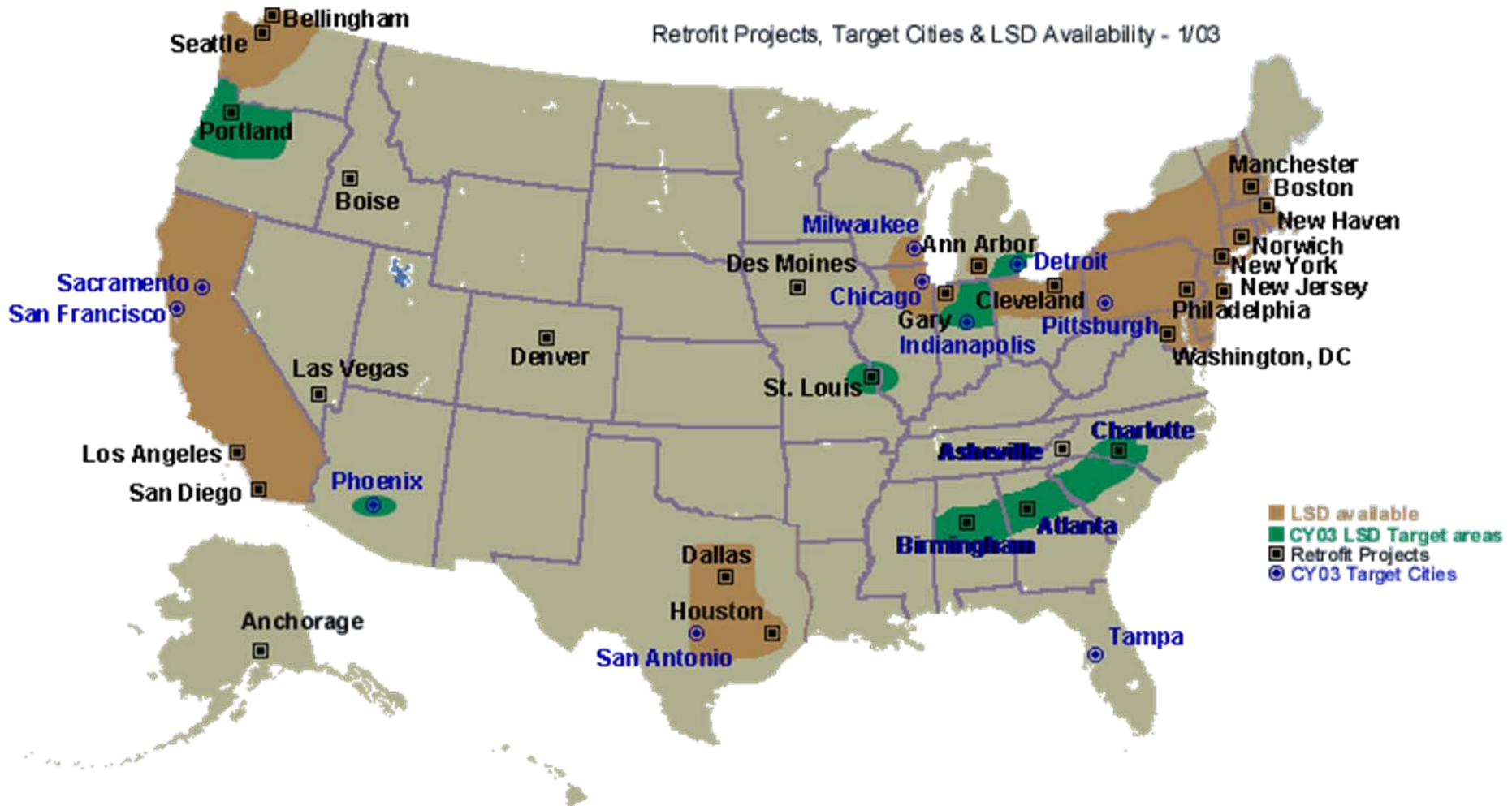


# ULSD Availability

- Several oil companies are producing/delivering ULSD today
  - BP Great Lakes, California
  - ConocoPhillips Pacific Northwest, Northeast
  - Sprague Northeast
  - Sunoco Northeast
  - Valero Texas
- ULSD is currently available in many cities in these regions for an incremental cost
  - Today, the key component in this cost is a transportation charge

# Retrofit Program Targets: 2003

(Future Project and ULSD Expansion)





# Successful Retrofit Program Model



- The Diesel Retrofit Program works best when:
  - EPA HQ and Regional offices create partnerships with local leadership
  - Local leadership is in the best position to:
    - Create expanding retrofit programs (as opposed to a single demo)
    - Work with local fleet management and decision makers
    - Know how to secure local and regional funding
- EPA will supply technical support:
  - Engine manufacturers
  - Retrofit manufacturers
  - Fuel refineries and suppliers



**“Tomorrow’s Buses for Today’s Children”**

# Clean School Bus USA

- Launched in April, 2003
- A partnership of private and public sector leaders working together to deliver resources and know-how to school districts
- Attracting wide interest
- Congress set aside \$5 million in 2003 for grants to school districts
  - The Administrator announced 17 recipients on Oct 22nd



# School Buses

- School buses are the safest way to school
  - 24 million children ride the bus to school everyday
  - There are about 450,000 school buses operating today
  - Today's kindergartner will have graduated from college before benefits of the 2007 standards are fully realized
- Today's buses:
  - Pollute up to 6 times more than clean diesel or CNG
  - Idle approximately 1/2 to 1 1/2 hours per day
  - Remain in the fleet an extended amount of time

# The Goal

- Provide the cleanest possible transportation for this generation of school children
  - Reduce school bus idling and adopt smart driving practices
  - Retrofit buses with modern pollution control technology
  - Replace the oldest buses
- Most of the nation's 450,000 school buses run on diesel
  - One-third were built before 1990 - should be replaced
  - Two-thirds can reduce emissions with clean technology and fuels



# Projects



- There are currently about 80 school bus projects in place nationwide
- More than 50 organizations have expressed interest in joining the CSB partnership
  - Corporations include 3M Corporation, Corning, Inc, BP, Philips, Scholastic, Inc
- EPA received 120 applications and nearly \$60 million in requests for the 2003 Clean School Bus USA grants program