

The Metropolitan Transportation Commission Urban Bus Diesel Retrofit Program

MOVING DOWN THE ROAD TO
CLEANER AIR: OAKLAND/BAY AREA
Diesel Emissions Reductions Funding Forum
November 6, 2006



Project Goal

To implement a new strategy that reduces Bay Area emissions and accelerates achievement of the region's air quality attainment standards.

Project Origin and Background

- **Intersection of federal state and local transportation air quality planning requirements**
- **California Air Resources Board (CARB) Public Transit Fleet Rule**
- **Bay Area 2001 SIP; Further Study Measure**
- **Generation of additional on-road mobile source emission reductions for the region**

Project Origin and Background

- **California Air Resources Board (CARB) Public Transit Fleet Rule**
 - Year 2000 bus regulations set fleet requirements, applicable to transit agencies
 - Set more stringent mid and long term oxides of nitrogen (NOx) and particulate matter (PM) emission standards for new urban bus engines
 - Transit agencies were required to choose either a diesel or alternative fuel compliance path
 - Fuel path selected determined compliance schedule and reporting requirements

Project Origin and Background

- **Bay Area 2001 SIP; Further Study Measures Component**
 - The 2001 Ozone Attainment Plan contained possible control measures which merited further study but were not SIP commitments
 - MTC and Bay Area transit operators would examine the potential to accelerate application of particulate traps on diesel buses to achieve earlier compliance with state regulations

Project Origin and Background

- **Additional On-Road Mobile Source Emission Reductions**
 - **Allows Bay Area buses surpass CARB requirements for NOx emission reductions**
 - **Helps in the transition towards cleaner urban bus emission technology**

Cleaire Longview™ Device

Description

- Integrates a NOx reducing catalyst (NRC) and a catalyzed, active diesel particulate filter (DPF)
 - Provides simultaneous control of NOx, PM, HC and CO emissions
 - Device is a muffler replacement unit that facilitates installation and maintenance
 - Twice the cost of PM reduction only filters
 - Possible 3% to 4% Fuel Penalty due to filter regeneration
- Non-CARB required additional NOx benefits can be used for air quality/transportation planning emission reduction needs**

Longview™ Installed

Metropolitan Transportation Commission Transit Retrofit Program:

Approximately 1,700 Longview retrofits installed by 1/1/2007.



AC Transit, Richmond, CA

Service along the San Pablo Ave. route

Over 2,500 operating hours on this system.

clēaire

ADVANCED EMISSION CONTROLS

System installed April, 2002



Planning and Programming

- Installation of nearly 1,700 retrofit devices on Bay Area diesel transit buses
- Allocation of \$14 M in CMAQ to pay half of purchase and installation costs
 - As per CARB Fleet Rule, regional operators only required to install a PM device at less expense
 - By providing CMAQ funding, MTC could claim NOx emission reduction benefits

Planning and Programming

- **CMAQ Funding Availability**
 - Commission approval
 - Regional Transit Operator's buy-in
- **Funding Mechanics**
 - Device total cost (\$18,500 each)
 - Regional Transit Operators share; FTA 5307 and 5309 funds (50% or \$9,250) – covers PM component
 - MTC share; CMAQ funds (44% or approx. \$8,200) – covers NOx component
 - Air Quality Management District and Local share; CMAQ matching funds (6% or approx. \$1,050) – covers NOx component

Regional Program Effectiveness

- **NOx Emission Benefits**
 - **25%** NOx reduction
 - **1.20** tons per day or **2,391** lbs per day
- **ROG Emission Benefits**
 - **65%** ROG reduction
 - **0.24** tons per day or **478** lbs per day
- **PM Emission Benefits**
 - **85%** PM reduction
 - **0.14** tons per day or **275** lbs per day
- **Over 85% CO Reduction Benefits**

Cost Benefit Calculation

Total Installed Cost (CMAQ portion \$8,190)	\$18,500
Discount Rate, i	3%
System Life (years)	11
Annualized Cost (\$)	\$2,000
Annual Mileage	39,000
Baseline Average NOx Emissions (g/mi)	23.98
NOx Reduction (%)	25%
Total NOx reduced over useful life (tons)	2.84
CMAQ Cost Effectiveness (\$CMAQ/ton)	\$3,526
Total Funding Cost Effectiveness	\$7,730

Current Status

- **Nearly 1,400 devices installed regionally**
- **Scheduled to install balance of 300 devices by end of 2006 calendar year**
- **Small mechanical effects**
 - **Soot cone accumulation causing some minor plugging**
 - **Slight software issues (false positive backpressure indication)**
- **Regional Transit Agencies give device overall high rating**

Additional Information

- **Speaker Contact:**
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- **CARB Public Transit Agencies regulatory website:** www.arb.ca.gov/msprog/bus/bus.htm
- **Cleaire Longview™ website:**
www.cleaire.com/site/products/index.html#