



Reducing On-Road Truck Emissions Through the Port of Los Angeles Air Quality Mitigation Program

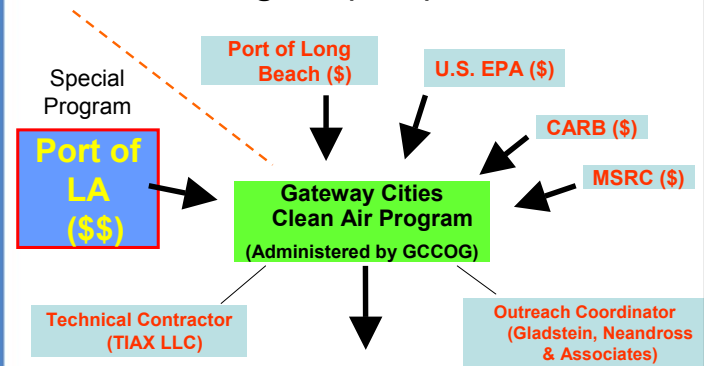
Environmental Management Division
Port of Los Angeles

Ethan Aumann, TIAX LLC
Jon Leonard, TIAX LLC
Ashley Moore, TIAX LLC
Jack Joseph, GCCOG

Faster Freight - Cleaner Air
January 30 – February 1, 2006



Current Structure for the Gateway Cities Clean Air Program (CAP)



- Three Primary Program Elements for POLA:
- Diesel Truck Fleet Modernization (Existing)
 - Truck Retrofits for Additional PM Control (Existing)
 - Possible Alternative Fuel Element to be Added (More later)



The POLA-Funded Gateway Program Reduces Emissions From Heavy-Duty Vehicles Servicing POLA

3



Typical pre-1987 truck



Typical 1999 or newer truck

- ▶ Old trucks (pre-1987) having little or no emissions controls are scrapped and **REPLACED** with cleaner, newer trucks
- ▶ These “replacement trucks” are **RETROFITTED** with devices that provide additional emissions reduction benefits
- ▶ **REFUELING** strategies (e.g., alternative fuels) are being considered to obtain even greater emissions reductions



Overview of POLA Fleet Modernization Under Gateway CAP

4

- Port haulers tend to drive the oldest trucks, and can't afford to upgrade
- Fleet mod helps replace pre-1987 trucks with 1999 or newer trucks
 - Incentive-based, voluntary program
 - Defines special POLA trucker “vocation”
 - Largest incentives to truckers that can prove they have been creating the most air pollution
 - Owner pays about one third of total replacement truck cost
 - Old truck engine and chassis are permanently destroyed
- **NOx and PM benefits are compelling and cost effective**
- **Trucker realizes about 30 – 40% reduction in fuel costs**



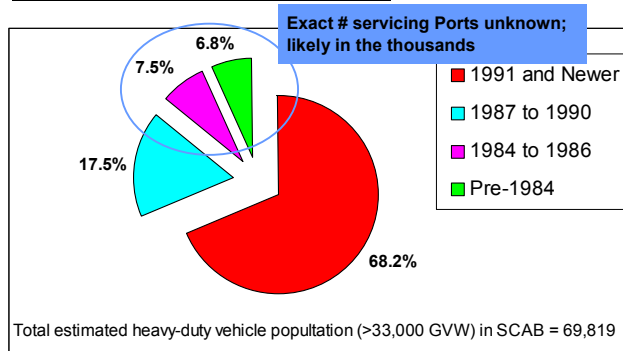
Gateway program truck undergoing scrapping process



Existing Population of HHDVs in South Coast Air Basin

5

It is estimated that about 15% of the heavy-duty Class 8 trucks in the South Coast Air Basin are MY 1986 and older. This equates to about 10,000 vehicles.



Source: EMFAC runs provided by the South Coast AQMD



The Gateway CAP Includes Multi-faceted and Effective Outreach

6

- Training for dealers
- Targeted, well-advertised outreach workshops for truckers
- Distribution of flyers and brochures in English and Spanish
- Toll-free call line maintained by TIAX (bi-lingual)
- Dealers' efforts to locate customers who are eligible for grant funding
- Bilingual Clean Air Program website linked to GCCOG's





Gateway CAP Outreach Event for Owner- Operators (August 2004 Wilmington)

7



- About 100 attended
- 9 dealers participated
- Details about the program and how to participate were provided
- Simultaneous translation provided



Dealers Are a Very Important Part of the Gateway CAP, Including Outreach

8

- 9 authorized truck dealerships

Los Angeles Freightliner Whittier

**¡DESHÁGASE DE SU CAMIÓN VIEJO!!
Y ADQUIERA UNO NUEVO**

**DUMP YOUR OLD TRUCK!!
& GET A NEW ONE**

ATTENTION

**MEMBERS OF
LOS ANGELES
FLORIDA**

**DOWN
PAYMENT**

**Three Great
Awards
Every
Month!!**

**GO WITH THE
DEALERSHIP
FOR THIS PROGRAM**

2004 LOS

**GATEWAY CLEAN
AIR PROGRAM**

Trade In

**TODOS LOS CAMIONES 1 AÑO / 100K MILLAS DE GARANTÍA EN EL MOTOR
ALL TRUCKS WITH 1 YEAR / 100K MILES ENGINE WARRANTY**

2429 S. Peck Road - Whittier, CA 90601



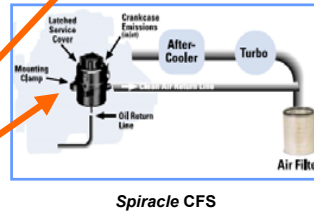
All POLA-funded Replacement Trucks Receive a Diesel Emission Control System (DECS)

- **Right now: Donaldson 6000 Diesel Oxidation Catalyst (DOC) System**

- CARB-verified "Level 1" system, achieves $\geq 25\%$ PM reduction
- Compatible with today's California (CARB no.2) diesel
- Verified for use on 1991 and newer on-road diesel trucks (Classes 5-8)

- **The system consists of two parts:**

- DOC muffler oxidizes soot to reduce PM emissions
- *Spiracle* Crankcase Filtration System (CFS) installed under hood to reduce blow-by gases
- DOC system maintenance



POLA's On-Road DECS Strategy (cont.)

Installing the DOC



Installing the *Spiracle* CFS





POLA's On-Road DECS Strategy (cont.)

11

- **Current Status**
 - DOC system installations began late September 2005
 - 23 installations as of January 2006
- **Future Options for Retrofit: Diesel Particulate Filters (DPFs)**
 - CARB-verified "Level 3", achieves $\geq 85\%$ PM reduction
 - Replaces most original equipment mufflers
 - Requires ultra-low sulfur diesel (ULSD) fuel
 - Requires regular filter cleaning / inspection
- **Another Future Option for Retrofit: Cleaire Longview**
 - Achieves 85% PM and 25% NO_x reduction



Internal view of a DPF



The Longview System



All POLA-funded Replacement Trucks Receive an Automatic Vehicle Locator (AVL)

12

- **Purpose**
 - Automatically monitor vehicle usage in the South Coast Air Basin (SCAB) and Port of Los Angeles sub-region
 - Eliminate biannual self-reporting forms for participants
- **Logistics**
 - GPS device installed by authorized technician prior to vehicle leaving dealership lot
 - Truck usage data automatically transmitted to vendor
 - Summarized data provided to GCCOG on monthly basis
- **Important Note**
 - Only parameters affecting the program's air quality benefits are monitored. No "real-time" monitoring will be conducted by the GCCOG (unless safety is involved).



GLOBALGUARD



Installation of AVLs

- **AVL Overview**
 - Weatherproof, tamperproof, and robust
 - GCCOG automatically notified if unit malfunctions
 - Product covered by 5-yr warranty
- **AVL Current Status**
 - Installations began late July 2005
 - 35 units installed to date
 - 45 existing participants are being called back to have AVLs installed in Jan / Feb 2006

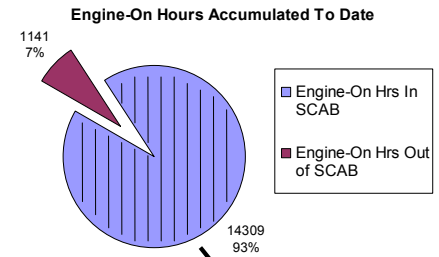


Authorized technician installing GlobalGuard AVL

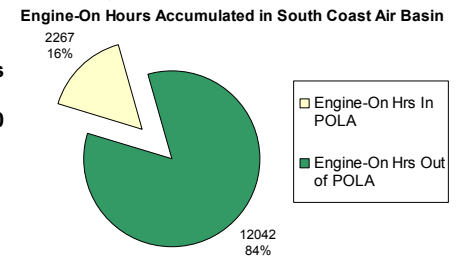
13



AVL Data Accumulated to Date



- The 35 participants with AVLs have combined for 9,000 inbound trips to POLA since late July 2005

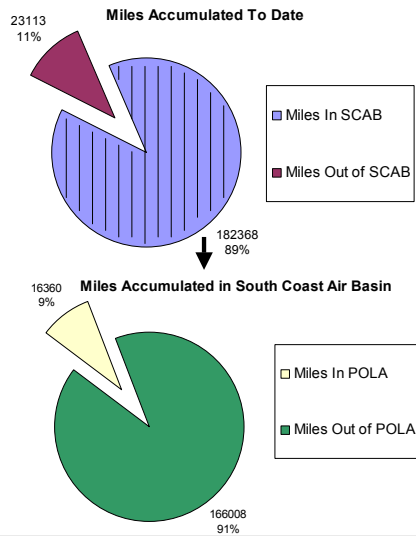


14



AVL Data Accumulated to Date (cont.)

15

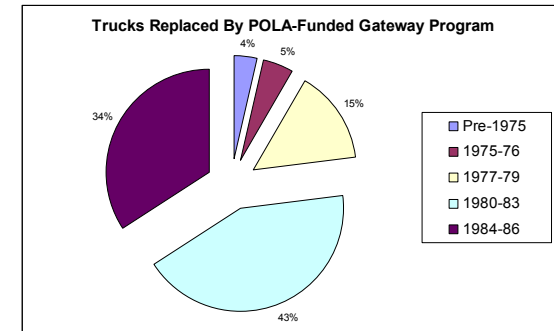


POLA-Funded Gateway Program Status and Air Quality Benefits

16

Current Status

- 253 POLA-funded replacement trucks
- \$6.26 in POLA incentive funds awarded
- Average Award: \$24,735





POLA-Funded Gateway Program Status and Air Quality Benefits (cont.)

17

- Estimated Emission Reductions**

- Emission benefits are dependent on mileage traveled and in-use emission factors
- Current estimated average emission benefit: 0.50 tons of NOx and 0.11 tons of PM per truck, per year (without DECS)

| | NOx | PM |
|--|------|------|
| Emission Benefit Per Truck (tons/yr) | 0.50 | 0.11 |
| 5-yr Emission Benefit Per Truck (tons) | 2.5 | 0.55 |
| 5-yr Emission Benefit 253 Trucks (tons) | 632 | 139 |

- Estimated Cost Effectiveness (5-yr life)**

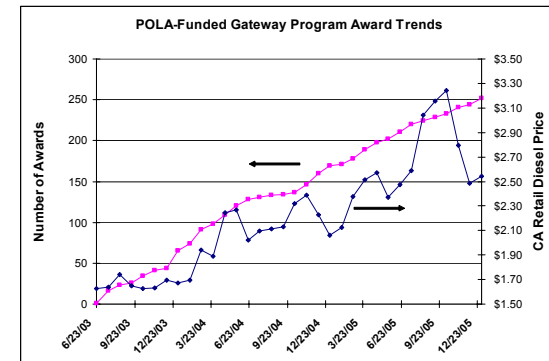
- Approximately \$11,100 per ton NOx based on current program calculations



Current Award Trends and Issues

18

- Volatility of Diesel Price for Owner-Operators**



- DECS / AVL Installation and Monitoring Logistics**
- 1099s for Owner-Operators**



Upcoming POLA Program Changes

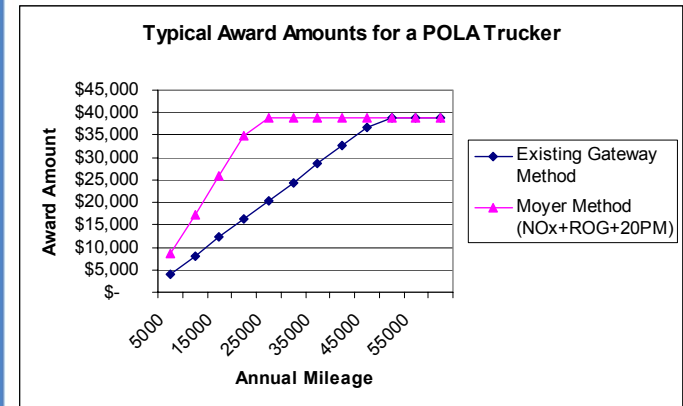
19

- **Normalize award methodology with new Statewide Carl Moyer fleet modernization source category**
 - Awards currently based on NOx cost effectiveness formula using EMFAC 2002
 - Moyer methodology will use combined cost effectiveness (NOx + ROG + 20*PM) of \$14,300 per ton and EMFAC 2005
 - Result: incorporating PM benefit is expected to INCREASE average award and IMPROVE cost effectiveness
- **Proposed LNG Replacement Truck Program**
 - ~\$2.2 M will continue to be directed toward diesel-to-diesel fleet modernization
 - “Discretionary” funds may be shifted away from diesel replacement to trucks fueled with natural gas
 - Program is under development by POLA staff



Upcoming Program Changes (cont.)

20



Example of potential award maximums (as a function of annual mileage) for MY 1983 truck replaced with MY 2000



Summary: POLA-Funded Gateway Fleet Modernization Program

- The POLA-Funded Gateway CAP continues to successfully reduce NOx and PM emissions from trucks heavily serving the POLA and surrounding communities
- For the existing 253 truck replacements, the estimated NOx and PM reductions over 5 years of program involvement will be 632 and 139 tons, respectively
- These emission reductions are cost effective and will become even more so with expected program updates
- Strong environmental justice benefits are also being realized
- The universe of potential participants with older trucks appears to be large (thousands)
- The Gateway team greatly appreciates the support of POLA's staff and the Harbor Commissioners



Thank you

For complete details about the Gateway Cities Clean Air Program, including the Fleet Modernization element, contact:

- **Administration:** Jack Joseph, Deputy Director, Gateway Cities COG, 562-663-6850
- **Technical Program:** Jon Leonard, Principal, TIAX LLC, 949-833-7131
- **Outreach Program:** Cliff Gladstein, President, Gladstein Neandross & Associates, 310-314-1934

