

Washington State Diesel Retrofit Programs

Mike Boyer
Diesel Programs Coordinator
Air Quality Program
Department of Ecology

Washington State Diesel Retrofit Programs

- Partnership between Ecology, local clean air agencies, & public fleet owners;
- Voluntary participation;
- Focus on reducing diesel particulates;
- Prioritized based upon public health benefits;
- Match retrofit technology to application;
- State contracts provide verified technologies.



Program Provisions

- 100% for parts and installations;
- 1-2 years of replacement filters;
- 1-3 years of filter regeneration;
- Technical assistance.



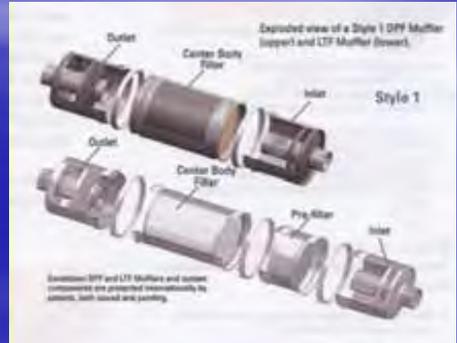
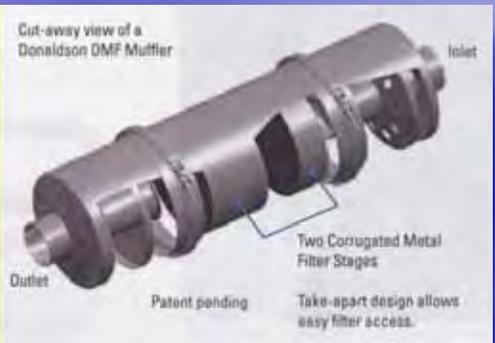
Funding

- School districts: \$23.5M over 5 years;
- Cities, counties, ports, & transit: \$2M
- Governor's budget: \$7.2M for 2007/2008 fiscal period for public fleets
- Proposed legislation could extend to private fleets.



Technologies and Fuels

Type	PM Reduction	Exhaust Temp	Maintenance
Diesel Oxidation Catalysts (DOC)	20-40%	>150°C	None
Diesel Multi-stage Filter (DMF)	50-70%	40% at 210°C	None
Diesel Particulate Filter (DPF)	90-95%	40% at 210°C	50,000 Miles
Closed Crankcase Ventilation (CCV) Filter	6-8%	None	Replacement Filter @ 500 hrs or oil change
Ultra-low Sulfur Diesel (ULSD)	7-8%	None	NA
Biodiesel (B-20)	10-18%	None	NA



School Buses

Priority: *Highest*

DOC: MY2000 and older

DMF: MY2001 and newer

DPF: MY2002 trip buses

CCV Filter: MY 1988 and newer



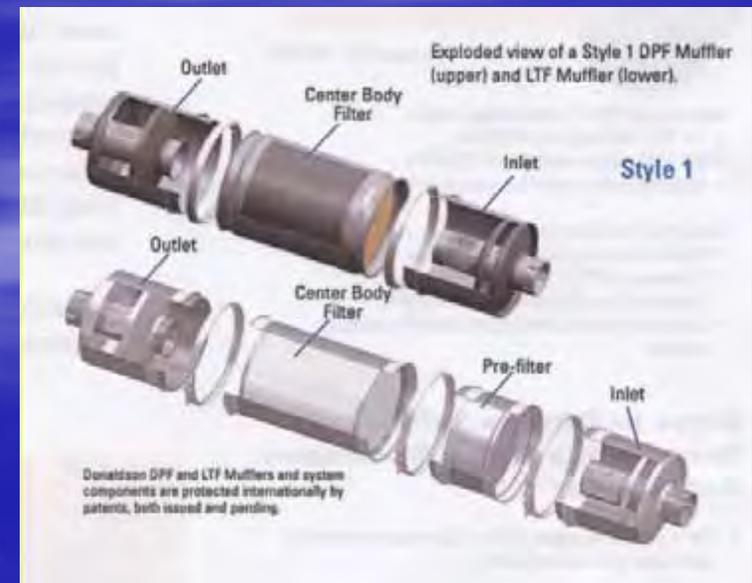
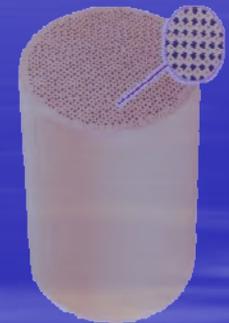
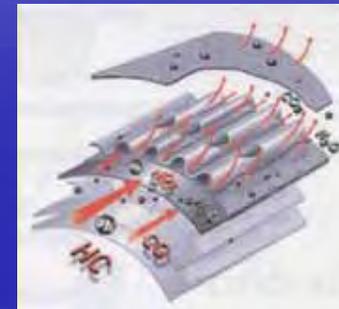
Transit Buses

Priority: *Very High*

DOC: MY1995 and older

DPF: MY2002 and newer

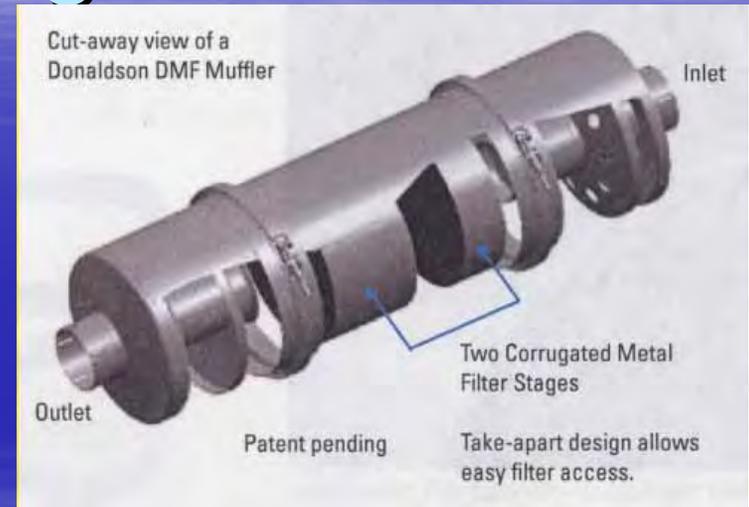
CCV Filter: MY1988 and newer



Refuse Vehicles

Priority: *High*

DOC: MY2000 and older
DMF: MY2001 and newer?



Road Maintenance Vehicles

Priority: *Medium*

DOC: All MY

DMF: Targeted application



Other Public Vehicles

Priority: *Medium to Low*

DOC: All MY

DMF: Targeted application



Diesel Retrofits Summary: Public and Private Fleets

	Local Government	State Fleets	School Buses	Private Fleets
Number of Engines	10,000	1,500	10,000	157,351
Targeted for Retrofit	7,000	1,300	8,500	98,970
Engines Retrofitted	1,900	35	4,500	0
Engines Remaining	3,100	1,265	4,000	98,970

Public Sector Fleet: Projected Retrofit Costs

Type	Number of Engines	Targeted for retrofit	Cost
School Bus	10,000	8,500	\$30M
Local Government	10,000	7,000	\$7M
State	1,500	1,300	\$2M

Private Sector Fleet: Projected Retrofit Costs

	Number of Engines	Targeted for retrofit	Cost
On-road > 14,000 GVW	85,000	52,400	\$190 M
Non-road > 175 HP	43,000	24,400	\$36 M
Switchyard Locomotives	170	170	\$4 M
Port Trucks & Equip	2,516	2,516	\$3.8 M
Truck Parking Spaces	2,665		\$8.1 M
Fuel Reduction (Aux power, plug-in, streamline)	24,000	22,000	\$11M - \$55M
Total	155,000	101,500	\$253M - \$297M