



*Cleaner Diesel
Technologies and CMAQ
Funding for Freight
Movement*

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Overview



- Air Quality Concern
- Clean Diesel Technologies
- Congestion Mitigation Air Quality Funding (CMAAQ)
- Conclusion

Diesel Engines Provide the Power

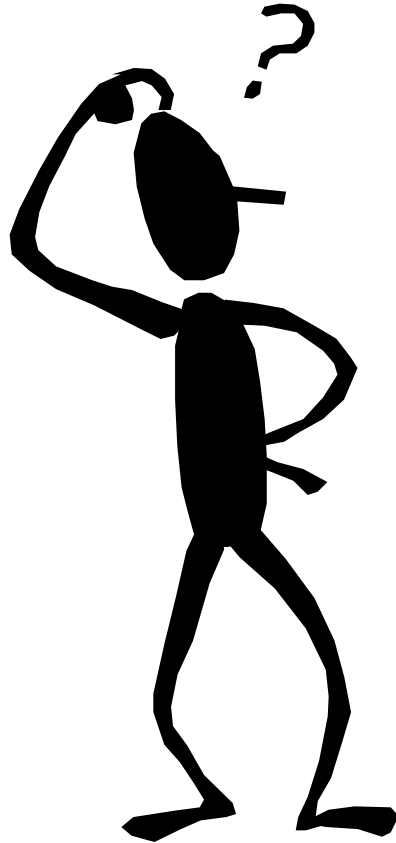
- Freight movement
 - Ships, Trains, Trucks and some cranes are powered by diesel engines
- Physical port, rail, and road expansions
 - Performed by diesel trucks and construction equipment



While Powerful and Efficient

- Health concerns about emissions from primarily older diesel engines
 - Especially in areas where ozone and/or particulate matter (PM) level exceed Federal standards
 - Primary pollutants of concern are NO_x and PM

What To Do About Emissions?



Technology Part of the Solution

- New trucks and equipment have cleaner diesel technologies
 - Attrition and accelerated replacements
- Engine upgrades and aftermarket retrofit devices
- Cleaner fuels and fuel technologies
 - Biodiesel, ULSD and TX or CA Low Emission Diesel

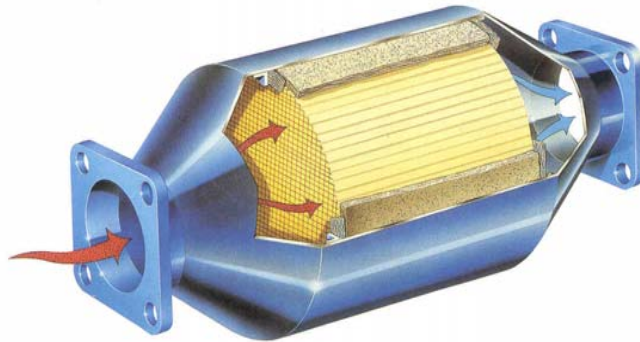
The Five R's

- **Retrofit** – new emissions control devices on existing engines (filters, catalysts, SCR)
- **Refuel** – cleaner diesel fuel, biodiesel, and additives
- **Rebuild/Repair** – repair/upgrade key components or engine reprogramming
- **Replace** – vehicle/equipment – multiple benefits
- **Repower** – put new or newer engine in existing equip. or chassis

PM Control Technologies

- Diesel Oxidation Catalyst (DOC)

CO
HC
PM
- Carbon
- SOF
NO_x

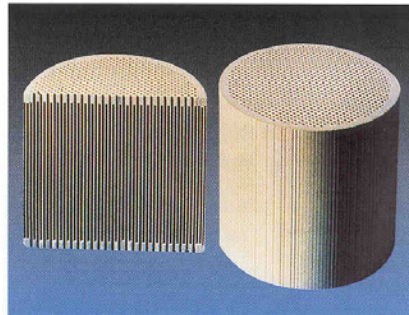
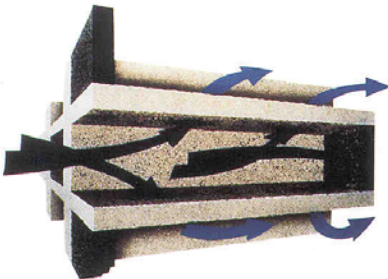


→ PM
- Carbon
NO_x
H₂O
CO₂

Provide 20+% PM emission reduction



- Diesel Particulate Filter (DPF)



Provide 90+% PM emission reduction

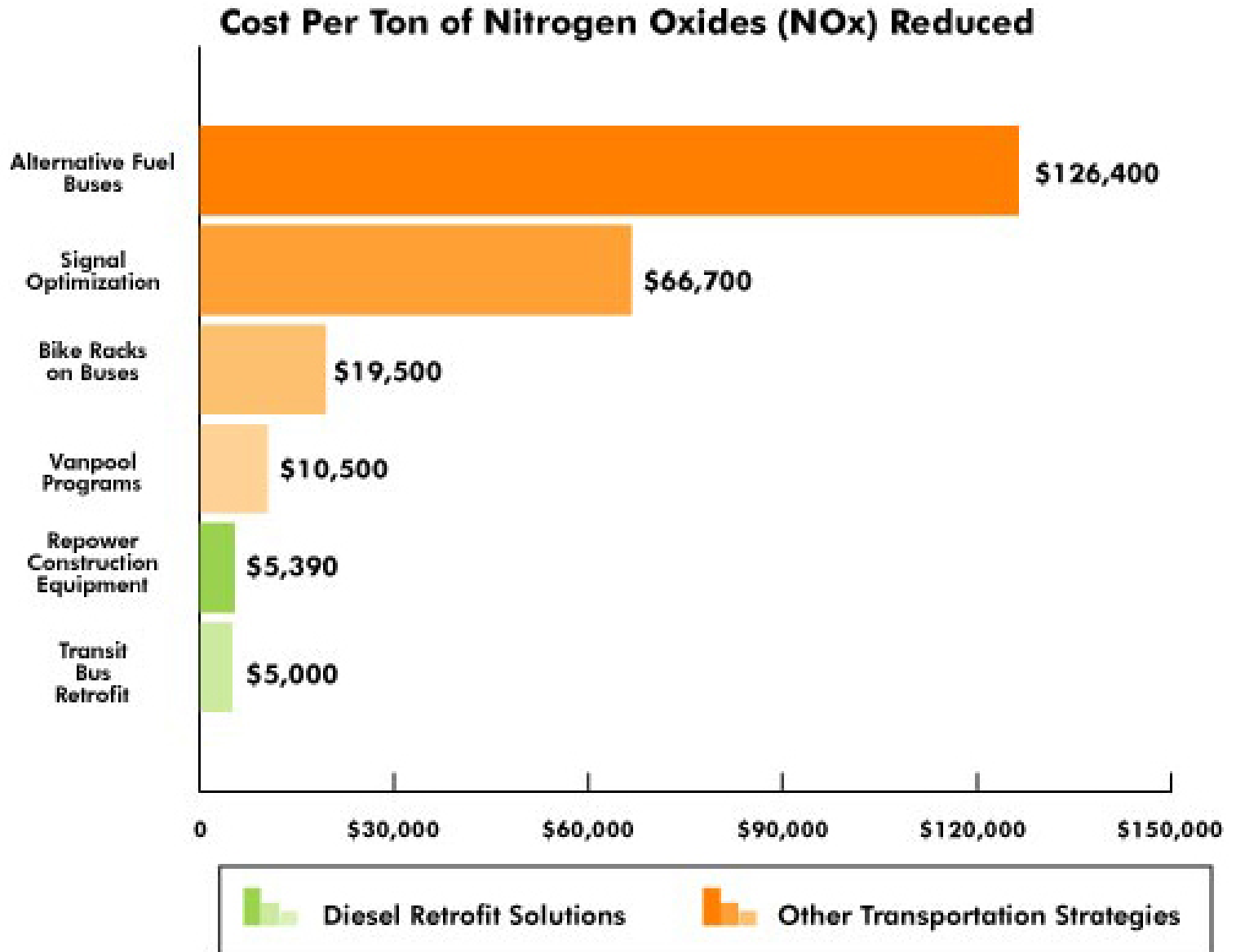
Plug in Active Diesel Particulate Filter



Be Aware of the Challenges

- Many old engines may not be compatible with cleaner technologies
- Technology selection and operation depend on:
 - Truck/equipment duty cycle
 - Engine horsepower
 - Engine emissions level
 - Other factors
- Cost-Effectiveness focus can result in most reductions with limited funding

Diesel Retrofits are Cost-Effective



What Else Can Be Done?

- Limit idling—also saves fuel
- Implement emissions reduction programs
 - Target gross emitters
 - Use CMAQ funds to pay for retrofits
 - Focus on *The Five R's*
- Contract incentives

Show Me The Money!



Congestion Mitigation Air Quality Funding (CMAAQ) Improvement Program

- Part of SAFETEA-LU
- ~\$1.7 Billion authorized per year
 - Portioned to areas with poor air quality
 - Funds Ozone, PM and CO reductions
- Administered by FHWA
 - Locally by DOTs and MPOs

CMAAQ funds must reduce/prevent emissions (directly or indirectly)

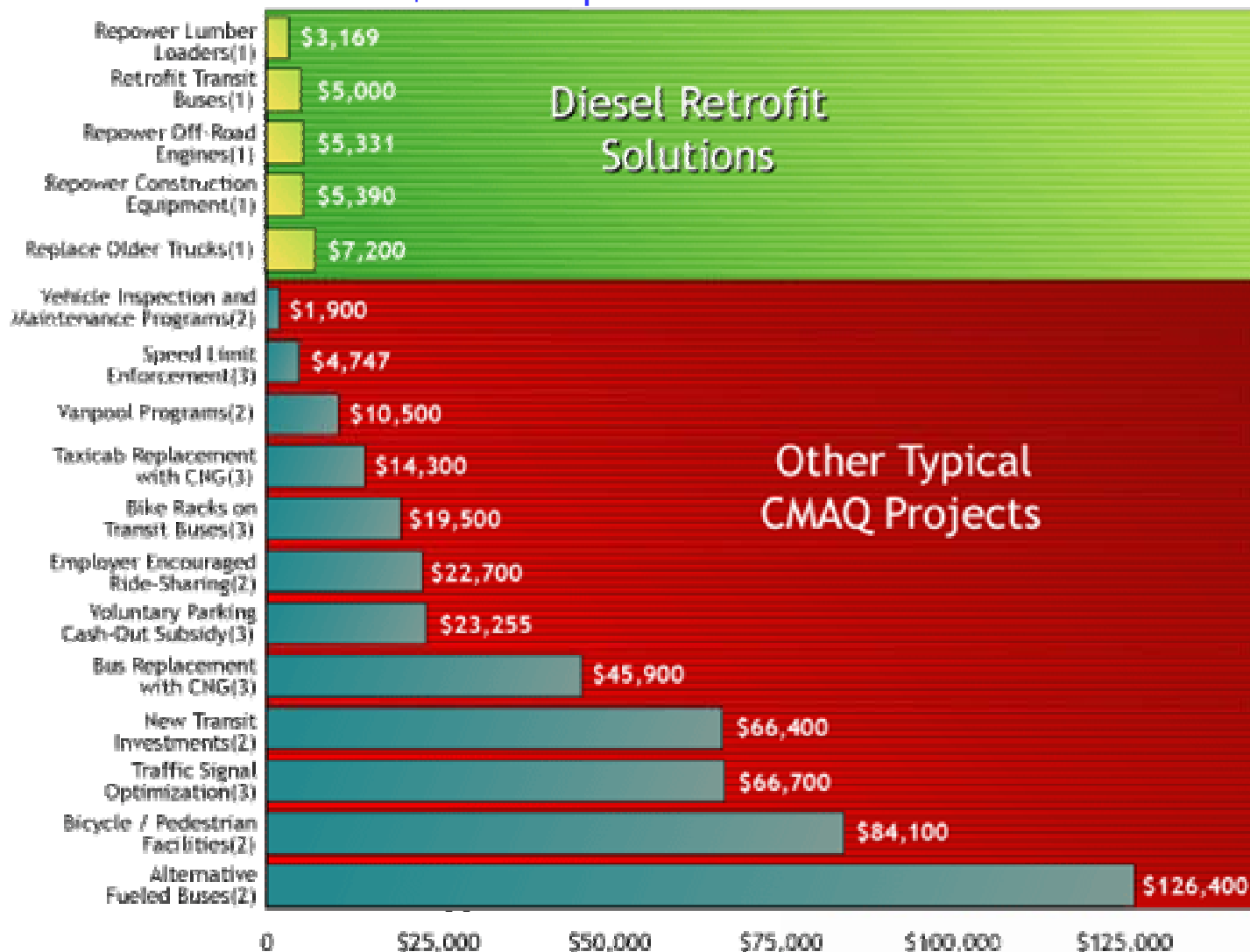
- Eligible projects include
 - Freight/intermodal funding
 - Diesel engine retrofits and advanced truck technologies
 - Idle reduction (APUs and infrastructure)
 - Training
 - Experimental projects
- Public private partnerships

Freight / Intermodal Funding

- Targeting freight capital costs—rolling stock or ground infrastructure
- New diesel technologies or diesel retrofits for trucks, trains, cranes, and yard equipment
- Infrastructure improvement that result in reduced truck miles (VMT)

Clean Diesel Retrofits are Cost-Effective Uses of CMAQ Funds

\$ Dollars per ton of NOx reduced



New: CMAAQ Funds Construction Equipment Retrofits on Title 23 Projects



Active Diesel Particulate Filter System (on board electric regeneration)

EMISSTAR

Conclusion

- Clean diesel technologies cost-effectively mitigate diesel emissions
- Intermodal improvements can reduce emissions
- CMAQ funds can cover a significant portion of the costs

Resources

- **Tod Wickersham, Emisstar LLC**

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- **CMAQ Guidance Documents**

www.fhwa.dot.gov/environment/cmaqpgs/

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- **Diesel Technology Forum**

www.DieselForum.org

