

# Congestion Mitigation and Air Quality Improvement (CMAQ) Program



U.S. Department of Transportation  
Federal Highway Administration



## Diesel Retrofits and Replacements

Diesel engines play a vital role in key industry sectors including freight, public transportation, railroads, construction, marine and agriculture. However, diesel exhaust contains high levels of fine particulate matter (PM<sub>2.5</sub>) emissions, which can pose significant risks to public health, including lung damage and premature death.

Typical diesel engines in heavy-duty trucks, locomotives and marine vessels can last up to 30 years, and the U.S. Environmental Protection Agency (EPA) estimates that more than 11 million older diesel engines are in use today. Unlike newer models, older engines are highly polluting. The Bipartisan Infrastructure Law (BIL) continued the eligible uses of CMAQ funds to include installation of diesel emission control technology on non-road diesel equipment or on-road diesel equipment that is used in highway construction and transit projects or port-related freight operations. Many diesel retrofit projects involve private sector participation through public-private partnerships.

Diesel oxidation catalysts and diesel particulate filters are the most frequently used diesel retrofit technologies. Diesel oxidation catalysts help lower engine emission through chemical reactions that convert carbon monoxide, hydrocarbons and aldehydes into carbon dioxide and water and diesel particulate filter retrofits help to remove diesel particulate matter or soot from the exhaust gas of a diesel engine.

Diesel retrofits offer a cost-effective means to reduce vehicle emissions of particulate matter. The harmful effects of diesel emissions on public health are well-established, and over 45 products are available on EPA's Verified Technologies List for Clean Diesel operations.

### Eligible Project Types

- Acquisition of retrofitted vehicles
- Installation of tailpipe emissions control devices
- Provision of diesel related outreach activities

### Eligible Diesel Retrofit Vehicles Types Include

- School buses
- Refuse trucks
- Transit buses
- Port-related drayage trucks
- Marine vessels
- Locomotives
- Construction equipment



## Examples of Successful Diesel Retrofit Projects

**New York, NY:** The New York City Department of Sanitation used CMAQ funds to retrofit approximately 828 refuse trucks. Diesel particulate filters were installed on 616 trucks, while diesel oxidation catalysts were used on the remaining vehicles – at a cost of \$10 million over several years.

- *Estimated emission reductions: 5,067.4 kg/year nitrogen oxides (NO<sub>x</sub>), 281.5 kg/year PM<sub>2.5</sub>, and 356.0 kg/year PM<sub>10</sub>*

**Chicago, IL:** At a cost of \$9.2 million (with local match provided by CSX), the Chicago Metropolitan Agency for Planning funded the retrofit of seven switcher locomotives at the CSX Barr Rail Yard in Riverdale, IL.

- *Estimated emission reductions: 12.4 kg/day volatile organic compounds, 308.2 kg/day NO<sub>x</sub>, and 8.6 kg/day PM<sub>2.5</sub>*

**San Francisco Bay Area, CA:** The Metropolitan Transportation Commission allocated funding to 12 transit agencies in the Bay Area to retrofit nearly 1,700 transit buses with diesel particulate filters. The project cost \$15.6 million (\$13.8 million CMAQ; \$1.8 million local match).

- *Estimated emission reductions: 2,250 kg/day NO<sub>x</sub>, 150 kg/day PM*

Photo: FHWA



### For more information, please contact:

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