



STATE DOTs AND REDUCING MOBILE SOURCE EMISSIONS

Strategies, Projects, Issues
and Challenges

AASHTO Air Quality Peer Exchange
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Mobile Sources, Air Quality and Little Regulatory Authority

- Relative contribution of mobile sources to nation's air quality challenges quickly increasing
- Mobile sources share of NO_x emissions
 - In Middle Tennessee, 60 percent
 - In Knox County, two-thirds
- Clean Air Act provides little authority to mandate reductions from existing vehicles
- 20 million diesel vehicles in Legacy Fleet
- State DOTs and MPOs need to play a major role in mobile source reductions

Air Quality Goals and Priority Pollutants

- Achieve EPA's NAAQS
 - CMAQ's purpose - help attain EPA health standards
- Reduce exposure to airborne toxic substances
- Priority Pollutants
 - Oxides of Nitrogen (NO_x) for ozone NAAQS
 - PM 2.5 for PM 2.5 NAAQS and airborne toxic substances
 - Volatile organic compounds (VOCs) for ozone and airborne toxic substances
 - Carbon dioxide (**but not with CMAQ funds**)

Reducing Diesel Exhaust Emissions

- Reducing diesel exhaust emissions a major priority
- New EPA engine standards do not cover 20 million* existing on-road and non-road diesel engines
 - Engine life up to 30 years
 - Many diesel engines manufactured before 2007 will still be on the road in 2036
- Diesel emissions affect public health and welfare
 - Reduce lung function
 - Aggravate asthma and respiratory diseases
 - May cause premature death
 - Increase risk of cancer

*U.S. Environmental Protection Agency


Reducing Diesel Emissions



- Diesel retrofit and idling reduction technologies are cost-effective control measures
- Retrofit options: replacement, repowering, rebuilding, aftertreatment or other technologies as determined by EPA or CARB
- Idling reduction technologies
 - Auxiliary power units (APUs)
 - Truck stop electrification
 - Automatic stop/start devices



Available Approaches and Funding Sources

- With a few exceptions, available emission reduction strategies limited to
 - Federal/State funds to finance emission reduction programs and projects
 - Public education and outreach
 - Voluntary efforts
 - Vehicle inspection programs
 - CMAQ primary and essential source of funding
 - EPA's Diesel Emission Reduction Act (DERA) program and regional Diesel Collaboratives also important
 - Transportation energy efficiency and reducing petroleum dependence are complementary goals
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CMAQ

Critical Resources for Cleaner Transportation

- Unique and crucial funding source
- Primary program that allows state DOTs and MPOs to fund projects that reduce emissions
- Depends on Congressional budget decisions
- Statutory formula distributes funds to states based on populations in nonattainment areas
- All CMAQ projects must
 - Be transportation projects
 - Must reduce emissions from transportation sources
 - Must benefit air quality in nonattainment areas



What can CMAQ accomplish?

- Pilot innovative projects
 - Establish infrastructure systems (ITS, bike-ped facilities, etc.)
 - Get project ideas up and running
 - Incentives for purchase of advanced technologies
 - Can improve traffic flow
 - Cannot fund increases in highway capacity
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CMAQ Issues

- CMAQ performance plans for large MPOs
- MAP-21 performance measures for CMAQ
- Buy America compliance
- Consistent emission reduction methods and assumptions
- Cost-effectiveness calculations
- Local match often hard to get
- Proposal submittal requirements a significant barrier to program participants

Cleaner Transportation Strategies

(at 10,000 Feet)

- Reduce vehicle miles
 - Transportation Alternatives
 - Transit, ridesharing, bicycle-pedestrian infrastructure and programs
- Cleaner technologies
- Cleaner fuels and power sources
- Idling reduction
- Cleaner freight movement
- Public education and outreach
- More efficient use of infrastructure
 - Transportation Systems Management & Operations
 - ITS, road incident phone apps, HELP truck programs, signal timing, transit signal priority, ramp metering
- Intersection improvements


Cleaner Transportation Goals and Tools

- Comprehensive effort with wide range of projects to reduce onroad and nonroad mobile source emissions
 - Reduce VMT growth rate
 - Encourage transportation alternatives
 - Retrofits and idling reduction
 - Improve traffic flow
 - Cleaner fuels
 - Cleaner vehicles
- Partnerships
 - MPOs, local governments, air quality agencies, private sector companies, nonprofits







Project Diversity and Synergy

- State DOT and MPOs fund mix of CMAQ projects in each nonattainment area
 - Continue to fund traditional projects, such as transit and signal synchronization
 - Begin funding new cost-effective projects, such as diesel retrofits or cleaner technologies
 - Suite of projects should provide synergistic benefits in each region
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Parallel Emission Reduction Strategies

- Short-term with immediate impact
 - Cleaner fuels (biofuels)
 - Cleaner engines (retrofits)
 - Long-term improvements in transportation system performance
 - Driver information (ITS)
 - Signal synchronization
 - Over time, increase use of transportation alternatives
 - Public education
 - Travel demand management
 - Transit and ridesharing programs
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Emission Reductions and Cost-Effectiveness

- Emission reductions a major criterion for selecting CMAQ projects for funding
 - MAP-21 continues priority on diesel retrofits and other cost-effective projects
 - FHWA interim CMAQ guidance November 2012 sets two major priorities
 - Diesel retrofits and other cost-effective emission control measures
 - Cost-effective congestion mitigation activities that provide air quality benefits
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Emission Reduction Priorities


- PM 2.5 set-aside funds
 - Incentives and rebates for cleaner technologies
 - Transit and ridesharing
 - Employer-focused programs
 - Freight movement
 - Road construction equipment
 - Roadway assistance programs
 - Idling reduction
 - Public information
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Tennessee CMAQ Projects

- Diesel retrofits and idling reduction technologies
- Retrofit technologies on TDOT trucks
- New regional transit service
- Purchase of hybrid transit buses
- Norfolk Southern Crescent Corridor intermodal facility near Memphis
- Green Islands - Biofuels refueling infrastructure along interstate corridors
- *Clear the Air Tennessee* public education campaign
- Travel demand management – Employer outreach
- Commuter vans for new vanpools
- Free transit rides on air quality action days
- Bicycle racks/lockers at state-owned buildings
- Intelligent Transportation Systems (ITS) in four major urban areas
- Hybrid vehicles for TDOT fleet



TDOT Clean Transportation Projects

- Lower speed limits for heavy-duty trucks
 - Nine (9) counties requested 65/55 speed limit
 - No mowing on air quality action days
 - Storage and dispensing biofuels at TDOT facilities
 - Biodiesel (B20) in TDOT diesel vehicles
 - Ethanol (E85) in TDOT flexible fuel vehicles
 - Switchgrass test plots along interstate right-of-way
 - Diversity of CMAQ projects
 - Immediate air quality benefits (retrofits)
 - Long-term investments to increase use of transportation alternatives
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TDOT State-Level Projects

- Cleaner Technologies Incentives and Rebates
- Employers Commuter Choice Program
- Green Island Biofuels Refueling Infrastructure
- Truck Stop Electrification



PM 2.5 Set-Aside Funds Cleaner Technologies Incentives and Rebates



Provide (1) Incentives for purchase of advanced technology vehicles and equipment and
(2) Rebates to diesel fleet owners to purchase and install cleaner technologies to significantly decrease particulate emissions


- Diesel Retrofits
- Engine Replacements and Upgrades
- Innovative technologies to reduce engine idling



↑ Freight participation
↓ Diesel exhaust emissions
↓ PM emissions by up to 90%



Employers Commuter Choice Program

- Travel demand management project
 - TDOT partnership with local governments
 - Aimed at employers
 - Encourage them to make it easier and more attractive/convenient for employees to use transportation alternatives
 - Transit passes, park and ride lots, rock star parking for carpools, flexible benefits for transit and vanpools
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Idling Reduction

- Idling reduction programs are low-hanging fruit
- Reduces fuel consumption
 - Idling diesels burn 0.5 to 1.0 gallon per hour
- Saves money
- Reduces engine wear
- Reduces emissions



IdleAire technology at truck stops helps reduce prolonged engine idling

Truck Stop Electrification

- Competitive grant from EPA in June 2009
- American Recovery and Reinvestment Act
- \$1.2 million for truck stop electrification (TSE) technology
- Green Corridor approach
- Three projects at truck stops along I-40
 - One more on I-81
- 117 truck parking spaces with TSE technology
- Cost-effectiveness, marketing plans, no-idle zones included in evaluation criteria

Tennessee's Biofuel Green Island Corridor Network

- Establish statewide network of publicly accessible B20 and E85 refueling stations ("Green Islands") along Tennessee interstates and major highways
- Help locate biofuel stations no more than 100 miles apart along major corridors
 - At least one E85/one B20 pump in priority counties
 - At least three E85 and three B20 pumps in urban areas



Tennessee Biofuel Signs on I-75

Mainline and ramp signs

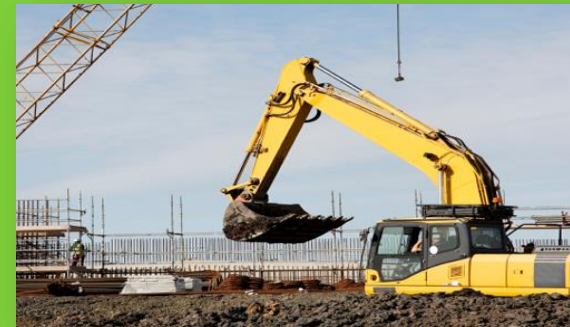


Cleaner Road Construction Pilot Project



Pilot project to upgrade road construction equipment to a cleaner emissions standard

- For a selected pilot project, TDOT will include a bid specification that will require that the project use clean construction equipment defined by emission performance
- Contractor bids must clearly define the company's plan to upgrade equipment to a clean construction level of performance and estimate the costs.
- TDOT plans to work with the selected construction company to upgrade their equipment with cleaner technologies to be used in that pilot project.
- Approved equipment upgrade costs will be covered by PM 2.5 set-aside rebate funds.



- ↑ Improved air quality
- ↑ TDOT good will
- ↓ Hazardous construction pollutants

Program & Application Information:
www.tdot.state.tn.us/cmaq

Freight CMAQ Projects




and

- CMAQ funds may be used
 - Improve efficiency of truck, rail marine operations
 - Intermodal freight facilities
 - Rolling stock and ground infrastructure
- Capital improvements that increase efficiency of freight movement between truck and rail, for example
- Up to three years of operating assistance for these types of projects
- Onroad and nonroad projects eligible




Freight CMAQ Projects

- Primary and secondary projects eligible for CMAQ
 - Primary projects reduce emissions directly
 - Secondary projects reduce emissions indirectly
 - Identify strategic projects to reduce freight-related congestion
 - Freight bottlenecks or concentrations of freight activity
 - Relieving congestion in areas where heavy-duty diesels concentrate will reduce idling and lead to smoother traffic flow
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Clear the Air Tennessee

- Statewide education/outreach program to
 - Educate the public about Tennessee's air quality challenges
 - Inspire citizens to improve air quality by changing transportation habits
 - Public education designed to change behavior
 - Our Mission
 - Improve air quality by educating citizens about
 - impact of transportation on air quality and
 - Commuter choices and behaviors that could help reduce emissions
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How can you improve the air quality
in Tennessee?

IDLE less...

PLAN your trips

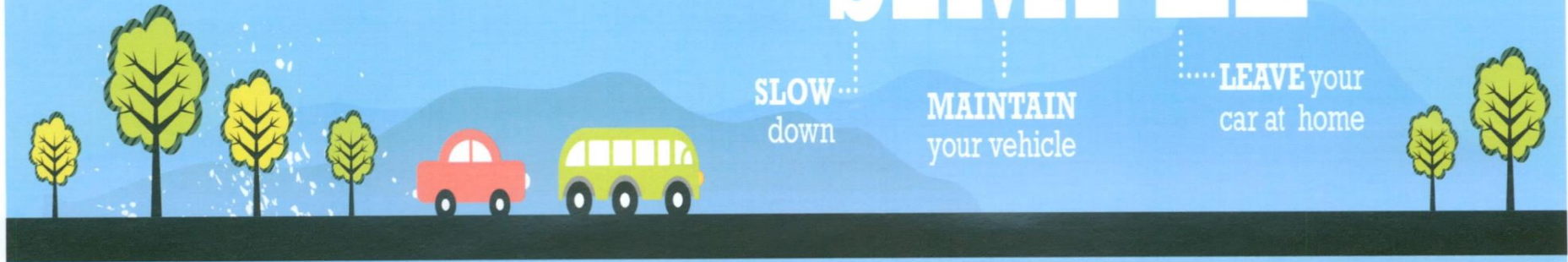
EDUCATE
others

SIMPLE

SLOW...
down

MAINTAIN
your vehicle

LEAVE your
car at home





For More Information

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