

NORTHEAST OHIO AREAWIDE COORDINATING AGENCY

MEMORANDUM

To: Transportation Advisory Committee

From: Pamela L. Davis, Interim Manager, Environmental Division
Amy M. Wainright, Environmental Planner

Date: September 10, 2007

Re: PM_{2.5} SIP Recommendations – Mobile Sources

Fine Particle Nonattainment

Six counties and one township in Northeast Ohio (Cuyahoga, Lake, Lorain, Medina, Portage, and Summit Counties, plus Ashtabula Township) are in nonattainment of the National Ambient Air Quality Standards (NAAQS) for fine particles. Fine particles are defined as particulate matter of less than 2.5 micrometers in diameter (PM_{2.5}).

Deadlines and the NOACA Stakeholder Process

Northeast Ohio must demonstrate clean air by 2010. The Ohio Environmental Protection Agency (Ohio EPA) must submit a State Implementation Plan (SIP) to USEPA by April 2008. NOACA, through a Memorandum of Understanding with Ohio EPA, engaged in an air quality stakeholder process to study potential emission reduction control strategies that could be included in the SIP for Northeast Ohio.

NOACA's Ongoing Role

As directed by the Governing Board, NOACA will have a role in implementation also as strategies are chosen for the SIP. Implementation will help to advance the Board's ten Transportation Goals. Economic competitiveness will be fostered (Goal #1) since it is important that the region come into attainment to become more attractive to new enterprises. Goal #2, conserving transportation energy, will be enhanced through several of the SIP recommendations, including anti-idling strategies. Finally, Goal #8, the strengthening of intergovernmental and private sector relationships, will receive focus through such strategies as joint funding opportunities, "clean" diesel scenarios, and truck stop electrification projects.

NOACA will also have to consider amending its Regional Transportation Investment Policy, as it did for the Ozone SIP Recommendations, to ensure the prioritization of PM_{2.5} SIP Recommendations. NOACA will have an implementation role in providing education, outreach, prioritizing CMAQ applications, and responding to related service requests from NOACA's members.

Recommendations

Following 10 months of study by the Air Quality Public Advisory Task Force, the Air Quality Subcommittee reviewed a series of emission reduction strategies and the potential impact on air pollution precursors emitted by mobile sources. (Mobile sources include cars, trucks, buses, trains, airplanes, off-road diesel equipment, etc.). The Subcommittee recommended the following strategies for endorsement and recommendation to Ohio EPA:

Mobile Source Emission Reduction Strategies

1. Diesel On-Road Strategies

- a. Mandatory Best Available Retrofit Technology (BART) on Government-Owned Vehicles, with Funding (*Requiring “clean diesel” replacements and retrofits, but only when a dedicated funding source has been identified*)
- b. Voluntary Diesel Emissions Reduction Programs for Private Vehicles (*Grant or loan programs, with educational component*)

2. Diesel Non-Road Strategies – Retrofit Financing

- a. Combining Private Financing with Government Grants (*Innovative funding for public and private non-road diesel retrofits*)
- b. Low Interest Financing (*Funding for state and local governments*)
- c. Technical Assistance to Construction Equipment Owners (*Education Outreach*)
- d. Information on Grant Programs (*State clearinghouse of information*)

3. Diesel Non-Road Strategies – Public Works Projects

- a. Emissions Performance Specifications in Contracts for Public Works Projects (*Ohio EPA and ODOT to create diesel emissions limits and/or equipment requirements and/or contract bonus points for construction equipment on all large public works projects*)
- b. Accelerated Use of Ultra-Low Sulfur Diesel Fuel or Biodiesel (*Required use of low-emitting fuels on all public works projects*)

4. Reduce Idling from Public Fleets

- a. Mandatory Statewide School Bus Idling Regulation (*Idling time limits*)
- b. Idling Reduction Regulations for Transit and Other Public Fleets (*Voluntary idling time limits, eventually followed by mandatory*)
- c. Loan Program to Reduce Idling (*Funding for cab heaters, auxiliary power units, etc.*)

5. Reduce Idling from Private Fleets

- a. Voluntary Anti-Idling Program with Educational Outreach (*Voluntary idling time limits, eventually followed by mandatory requirements*)
- b. Contract Requirements for Public Projects Using Private Fleets (*Limit idling time for construction equipment*)

- c. Revolving Loan or Lease-to-Own Program for Anti-Idling Equipment (*Funding for cab heaters, auxiliary power units, etc.*)
- d. Reduce Idling from Switchyard and Line-Haul Locomotives (*State or federal law to limit railroad idling time*)

6. Truck Stop Electrification (TSE)

- a. Identify Key Sites for TSE (*Providing electric hook-up power at truck stops, rest areas, Turnpike locations, etc.*)
- b. Financing Program for TSE (*Public and private funding*)
- c. Require New Truck Stops to Include TSE Infrastructure (*ODOT to ensure hook-ups at all new rest areas, etc.*)

7. Alternative Fuels and Electric Vehicles

- a. Increased Use of Ethanol (E85) (*Public and private fleets*)
- b. Increased Use of Biodiesel (*Public and private fleets*)
- c. Increased Use of Natural Gas (*Public and private fleets*)
- d. Increased Use of Propane (*Public and private fleets*)
- e. Increased Use of Electric Vehicles (*Public and private fleets*)

8. Roadside Diesel Opacity Testing

- a. Statewide Roadside Diesel Opacity Testing – Public and Private Fleets (*Exhaust “smoke” testing for trucks, buses, etc., with (1) warning and (2) fine, to improve emissions from local fleets and those passing through*)

9. Transportation Projects

- a. Conformity Analysis of Innerbelt Project for Nonroad Emissions (*Comprehensive study of diesel construction equipment emissions*)

10. Fuel Testing - Emission Reduction Strategies

- a. Statewide Testing of Gasoline and Diesel Fuel Specifications (*Check for excess sulfur, water, etc., at distribution points*)

11. Statewide Car Standards

- a. Adopt a Safety/Anti-Tampering Inspection Program (*Prevent “dumping” of poorly functioning cars and trucks in Ohio*)

12. Ports

- a. Truck Traffic Anti-Idling Policy at the Port of Cleveland/Cuyahoga County (*Limit idling time while waiting for (un)loading*)

13. Airports

- a. Ground Support Equipment (GSE) Replacement with Electric, CNG, or Other Clean Technology (*Low-emission baggage carts, fuel trucks, etc., with potential funding available through the federal Voluntary Airport Low Emissions (VALE) Program*)

More extensive material on each strategy is available in the Task Force reports, found at: www.noaca.org/pmsipplan.html. The Task Force membership appears below:

NOACA Air Quality Public Advisory Task Force – Fine Particle SIP 2006-2007

FirstName	LastName	Title	Organization
David	Beach		EcoCity Cleveland
Betty	Blair	Commissioner	Lorain County
Michael	Bower	Assistant Fleet Maintenance Manager	Cleveland Municipal School District
Joseph	Calabrese	CEO & General Manager	GCRTA
Pat	Carey		Greater Ohio
Sharon	Dietrich		League of Women Voters
Albert	Dispenza	Director of Planning	Ashtabula County Planning Commission
Robert	Dominak	Residuals & Air Emission Manager	NEORS
Theodore	Esborn	Attorney	McDonald Hopkins Co. LPA
Raymond	Evans	Manager, Env. Monitoring & Reporting	First Energy
Kathleen	Fagan	MD	Community Health Partners, Lorain /EHW
Jane	Goodman	Councilperson,	City of South Euclid
Marvin	Hayes	Exec. Assistant to Comm. Hagan	Cuyahoga County Commissioners
Colin	Johnson		Cuyahoga County Board of Health
Sumita	Khatri	MD	MetroHealth Medical
Linda	Kimble	Project Coordinator	Cleveland Clean Air Century Campaign
Ray	Kirchner	Mayor	City of Mentor
Robert	Klaiber	Task Force Chair	Cuyahoga County Engineer
David	Lane	Corporate Development Director	Ohio Technical College
Phil	Lane		New America Energy
David	Lang	Head, Allergy/Immunology Section	Cleveland Clinic Foundation
Emily	Lee		American Lung Association of Ohio
Robert	Leidich	Manager	BP Products
Susan	Luria		Team NEO

William	Margalis	Councilman	City of Wickliffe
Tim	McCormack		Cuyahoga County Planning Commission
Richard	Nemeth	Commissioner	City of Cleveland Division of Air Quality
Brian	Newbacher	Director of Public Affairs	AAA East Central
Todd	Rambasek	MD	MetroHealth Medical
Mary	Samide	Commissioner	Geauga County
Scott	Sanders		Earth Day Coalition
Jason	Segedy	Transporation Planning Administrator	Akron Metropolitan Area Transportation Study
Deborah	Sutherland	Mayor, City of Bay Village	Cuyahoga County Mayors & Mgrs Assn.
Tom	Szilagyi	Energy Specialist	Sunrise Cooperative
Dan	Tasman		Lake County Planning Commission
Bob	Thompson	Medina County Commissioners' rep	Town & Country
JoAnn	Uhlik	Dir., Innovation & Competitiveness	Greater Cleveland Partnership
Richard	Zavoda	Environmental Manager	Mittal Steel

Stationary Sources of Fine Particle Pollution

In addition to the Mobile Source Emission Reduction Strategies, the Task Force and the Air Quality Subcommittee also analyzed emission reduction strategies for stationary sources of pollution and will also be asking for NOACA Governing Board endorsement of the recommendations to Ohio EPA.

Summary Matrix – Tonnage of Pollution Reduced and Costs

A “Summary Matrix” of all of the strategies has been included below. The matrix outlines a brief description of strategy and the estimated amount of pollutant reductions and associated costs.

Summary Matrix

Note: Many of the figures below were obtained from Environ, a subcontractor to the Lake Michigan Air Directors' Consortium (LADCO), in *"Final Report: Evaluation of Candidate Mobile Source Control Measures for LADCO States in 2009 and 2012"* (March 21, 2007).

Strategy No.	Emission Reduction Strategy	Pollutants Reduced	Cost
Mobile Sources			
1.a.	Diesel On-Road: Mandatory Best Available Retrofit Technology (BART) for Government-Owned Vehicles, with Funding	0.09 tons per day (tpd) PM	\$8,561,949 for 4,281 public vehicles in NE Ohio
1.b.	Diesel On-Road: Voluntary Emissions Reduction Programs for Private Vehicles	5.7 tpd NOx 0.28 tpd PM	\$177,065,574 for private vehicles in NE Ohio, plus possible \$500,000 to administer the program
2.a., b., c., d.	Diesel Non-Road: Retrofit Financing	1.94 tpd NOx 0.08 tpd PM	\$39,071,902 for NE Ohio
3.a., b.	Diesel Non-Road: Public Works Projects	0.19 tpd NOx 0.01 tpd PM	\$3,907,190 for NE Ohio
4.a., b., c.	Reduce Idling from Public Fleets	0.21 tpd NOx 0.005 tpd PM	\$29,270,062 for NE Ohio, if anti-idling technology purchased
5.a., b., c.	Reduce Idling from Private Fleets	0.21 tpd NOx 0.005 tpd PM	\$29,270,062 for NE Ohio, if anti-idling technology purchased
5.d.	Reduce Idling from Switchyard and Line-Haul Locomotives	0.006 tpd NOx per locomotive 0.0003 tpd PM per locomotive	\$30,000 per auxiliary power unit purchased
6.a., b., c.	Truck Stop Electrification	0.38 tpd NOx 0.01 tpd PM	\$2,000,000 for remaining two truck stops in NE Ohio
7.a.	Increased Use of Ethanol (E85)	10% NOx reduced 20% PM reduced	Equivalent to gasoline; 5-15% fuel penalty
7.b.	Increased Use of Biodiesel (B20 and B100)	NOx impact unknown 15% PM reduced	Slightly more expensive per gallon than diesel
7.c.	Increased Use of Natural Gas (NG)	35% NOx reduced for cars 80% NOx reduced for diesel trucks 100% PM reduced for both	15-40% less in cost per gallon than gasoline or diesel
7.d.	Increased Use of Propane	SO2 and PM reduced	\$1.50 per gallon
7.e.	Increased Use of Electric Vehicles	0.1 tpd NOx for 100 electric hybrid vehicles similar for electric forklifts	\$3,000 extra per electric vehicle, or \$300,000 extra for fleet of 100

8.a.	Statewide Roadside Diesel Opacity Testing	PM reduced	\$700,000 to administer program; gain of \$4,000,000 through fines; costs to violating trucks of up to \$1,000 in repairs
9.a.	Conformity Analysis of Innerbelt Project for Non-Road Emissions	Unknown	Cost to NOACA to perform the analysis, plus costs to reduce emissions, if needed
10.a.	Statewide Testing of Gasoline and Diesel Specifications	SO2 reduced	\$750,000 for statewide implementation
11.a.	Statewide Safety/Anti-Tampering Standards for All Vehicles	CO, VOCs, NOx and PM reduced	Costs borne by owners through a fee for inspection
12.a.	Port of Cleveland-Cuyahoga County - Truck Traffic Anti-Idling Policy	0.027 tpd NOx 0.002 tpd PM	Cost-saving through fuel savings.
13.a.	Cleveland-Hopkins International Airport - Replace Ground Support Equipment with Clean Technology	NOx reduced PM reduced	Cost depends on replacement vehicles chosen
Stationary Sources			
1.a.	Steel Mills - NOx RACT for Industrial Boilers	NOx reduced	Cost depends on fuel costs
2.a.	NOx Credit Trading Bank with Partial Credit Retirement	NOx reduced	\$100,000 for one year of Ohio EPA administration
3.a., b.	Retrofit or Replace Large and Medium Diesel Generators	15.84 tpd NOx statewide	\$30,000,000 statewide
3.c.	Public Education Regarding Purchases of Small Diesel Generators	NOx reduced	Minimal cost for public outreach through government websites
4.a.	Adoption of NESCAUM Model Rule for Outdoor Hydronic Heaters (wood-fired boilers)	NOx reduced PM reduced elemental carbon reduced organic carbon reduced	Cost for each new unit is approx. \$8,000. No cost to existing units if they are "grandfathered."
4.b.	Mandatory "No Burn" Days When Ozone or PM Levels Are Elevated	NOx reduced PM reduced elemental carbon reduced organic carbon reduced	Minimal cost through NOACA's Ozone Action and Fine Particle Pollution Programs; enforcement costs
4.c.	Voluntary Wood Stove Change-Out Program	NOx reduced PM reduced elemental carbon reduced organic carbon reduced	\$75,000 for grant funds and to administer program

5.a.	RACT for Hot Mix Asphalt Plants	SO2 and NOx reduced	Cost depends upon option chosen by permittee; some are fuel-saving and cost-saving
6.a.	Restaurants - Catalytic Oxidizer for Chain-Driven Charbroilers	0.03 tpd PM	\$4,700 for each unit, for 100 restaurants, would total \$470,000
7.a.	Use of Liquefied Brine to Reduce Total Applied Road Salt	20-30% PM reduced	Cost savings are purported to recoup the cost of each \$30,000 brine mixer
7.b.	Strict Adherence to Local Salt Minimization Policies	PM reduced	Minimal cost in outreach; cost savings for salt saved
8.a.	Enforcement Practices: Adjusting to an Appropriate Level of Environmental Staffing	SO2, NOx, and PM reduced, if violations found and corrected	\$800,000 per year for 8 additional enforcement staff; some costs may be recouped through fines
9.a.	Long-Term Solutions: Wind Power and Renewable Portfolio Standards	26.25 tpd NOx for 10 wind turbines	\$10,000,000 for installation of 10 wind turbines, plus operation and maintenance
9.b.	Long-Term Solutions: Energy Audits for Businesses and Municipalities	SO2, NOx, and PM reduced through reduced electricity draw	\$500,000 for 100 organizations to have a \$5,000 audit performed
9.c.	Long-Term Solutions: Encouraging Local Manufacture of Energy Efficient Components	Reductions spread nationally and globally	High start-up costs

BART – Best Available Retrofit Technology.
 CMAQ – Congestion Mitigation and Air Quality funds.
 DOC – Diesel oxidation catalyst.
 DPF – Diesel particulate filter.
 Environ – Subcontractor to LADCO.
 LADCO – Lake Michigan Air Directors’ Consortium.
 NOx – Oxides of nitrogen.
 ODOD – Ohio Department of Development.
 ODOT – Ohio Department of Transportation.
 PM – Particulate matter.
 PM_{2.5} – Particulate matter of less than 2.5 micrometers in diameter.
 RACT – Reasonably Available Control Technology.
 SO₂ – Sulfur dioxide.
 THC – Total hydrocarbons (volatile organic compounds).
 TSE – Truck stop electrification.
 ULSD – Ultra-low-sulfur diesel fuel (15 parts per million sulfur)
 VOC – Volatile organic carbon.