

NOACA

**Final Report of the
NOACA Air Quality Public Advisory Task Force
on the 8-Hour Ozone SIP Options**

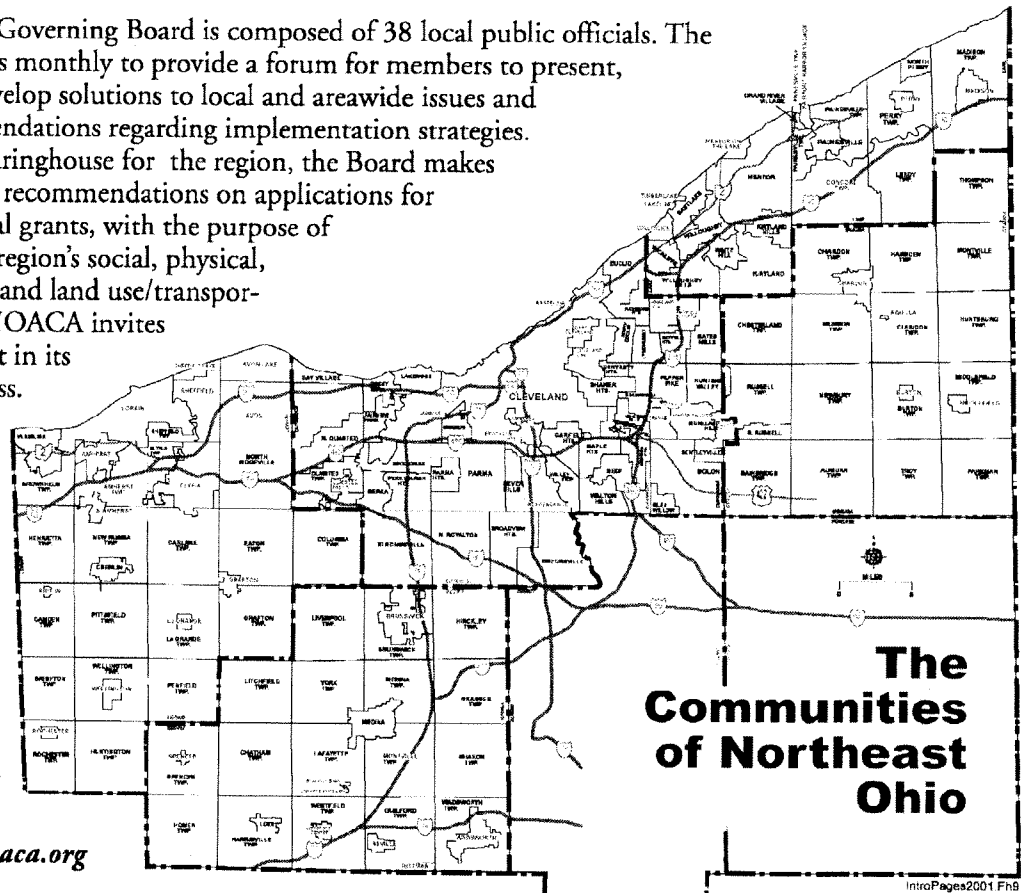


The Northeast Ohio Areawide Coordinating Agency (NOACA) is a public Organization serving the counties of and municipalities & townships within Cuyahoga, Geauga, Lake, Lorain and Medina (covering an area with 2.1 million people). NOACA is the agency designated or recognized to perform the following functions:

- **Serve as the Metropolitan Planning Organization (MPO), with responsibility for comprehensive cooperative and continuous planning for highways, public transit, and bikeways, as defined in the Transportation Equity Act for the 21st Century.**
- **Perform continuous water quality, transportation-related air quality and other environmental planning functions.**
- **Administer the area clearinghouse function, which includes providing local government with the opportunity to review a wide variety of local or state applications for federal funds.**
- **Conduct transportation and environmental planning and related demographic, economic and land use research.**
- **Serve as an information center for transportation and environmental and related planning.**
- **At NOACA Governing Board direction, provide transportation and environmental planning assistance to the 172 units of local, general purpose government.**

The NOACA Governing Board is composed of 38 local public officials. The Board convenes monthly to provide a forum for members to present, discuss and develop solutions to local and areawide issues and make recommendations regarding implementation strategies. As the area clearinghouse for the region, the Board makes comments and recommendations on applications for state and federal grants, with the purpose of enhancing the region's social, physical, environmental and land use/transportation fabric. NOACA invites you to take part in its planning process.

Feel free to participate, to ask questions and to learn more about areawide planning. For more information, call: (216) 241-2414 or log on at: <http://www.noaca.org>



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May 17, 2006

Prepared by

NORTHEAST OHIO AREAWIDE COORDINATING AGENCY

Principal Authors: Amy M. Wainright, Esq., Air Quality Planner
Pamela Davis, AICP, Senior Environmental Planner

STEPHEN D. HAMBLEY
BOARD PRESIDENT

HOWARD R. MAIER, FAICP
EXECUTIVE DIRECTOR

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A. EXECUTIVE SUMMARY

The NOACA Air Quality Public Advisory Task Force, during the course of 2005-2006, reviewed the 80 options described in Appendix A, evaluating them for possible inclusion in a State Implementation Plan (SIP), to be created and submitted by the Ohio Environmental Protection Agency (Ohio EPA) to the United States Environmental Protection Agency (USEPA), designed to bring Northeast Ohio into attainment of the 8-Hour Ozone National Ambient Air Quality Standard (NAAQS) by June 2010.

The Task Force, after ranking the 80 options in priority order through voting, found that the following options rose to the top:

1. **Low-Reid Vapor Pressure (RVP) gasoline of 7.8 psi for the summer of 2009, followed by low-RVP gasoline of 7.0 psi for the summer of 2010** and every summer thereafter until the standard is attained.
2. **Anti-idling policies** for cars, trucks, buses, and off-road equipment across Northeast Ohio. Although these could be implemented voluntarily by policy at individual agencies and employer, or through municipal ordinance, or by state law, the Task Force recommends that they be set "at the state policy level" (whether by state law or by state air pollution regulation) to affect both public and private vehicles, using a reasonable approach such as that contained in the USEPA Model Anti-Idling Ordinance.
3. **Voluntary trip reduction programs** across Northeast Ohio, including increased transit use, carpooling and Rideshare, compressed work weeks, telecommuting, conference calls and other "virtual meetings," trip combining and increased efficiency in routing and deliveries, and commuting alternatives such as bicycling and walking. The Task Force did not support mandatory trip reduction programs, either for government agencies or for employers of a certain size.
4. **Truck stop electrification** of the 3 large truck stops in Northeast Ohio (2 in Medina County and 1 in Cuyahoga County). Such electrification services, provided by a private contractor such as IdleAire, would allow diesel tractor-trailer rigs to turn off their engines while parked and, at the same time, "plug in" for an hourly fee to receive lights, heat, power, computer hook-ups, air conditioning, and other necessary services in the truck's cab.
5. **Continued support for ODOT's Intelligent Transportation System (ITS)** in the Cleveland area and the Akron area, which will relieve traffic congestion through vehicle counting, electronic signage, and radio broadcasts.
6. For E-Check Enhancements, **adoption of the Acceleration Simulation Mode (ASM) 2525 Final Standards for pre-1996 cars** not having onboard diagnostic (OBD) testing capability. These models are currently tested using dynamometers.

7. **Transit incentives (free rides)** to encourage use of mass transit on high air pollution days.
8. Greater use of **transit centers** to make transit more attractive to riders. This recommendation also includes Park & Ride Lot Enhancements and Transit Waiting Environment Improvements.
9. Continued support for **traffic signal synchronizations** such as those already contained in the Transportation Improvement Programs (TIPs) for NOACA and for the Akron Metropolitan Area Transportation Study (AMATS).
10. **NOx retrofits for diesel vehicles**, specifically by using selective catalytic reduction (SCR) devices on on-road trucks. The Task Force will continue to study all diesel retrofit options for possible inclusion in the PM_{2.5} SIP. Recommendations will be made in early 2007.
11. **Additional enforcement of existing speed limits** specifically those where cars and trucks are exceeding 55 mph in a 55 zone or 60 mph in a 60 zone.
12. **Replacement of ground-support vehicles** at Cleveland-Hopkins International Airport with electric, CNG, or hydrogen vehicles.
13. **Cold cleaners/degreasing operations controls** through the adoption of the Chicago-Metro East Regulations on a **statewide** basis.
14. More stringent limits for formulation of **industrial surface coatings for area sources** by creating more stringent RACT (Reasonably Available Control Technology) rules, lowering the applicability thresholds, and extending geographic coverage to **statewide**.
15. More stringent limits for formulation of **consumer and commercial products** by adopting the Ozone Transport Commission Model Rules **statewide** with additional product coverage and more stringent VOC limits, a 14.2% reduction beyond current federal regulation. The Task Force did not support the more expensive and more stringent standard set in California by the California Air Resources Board.
16. Improved design of portable fuel containers (**gas cans**) by **adopting the Ozone Transport Commission Model Rule statewide**, for an 18% reduction in 2009 and a 54% reduction in 2015, assuming a 10% turnover per year, starting in 2007. No "old style" gas cans would be available for purchase in Ohio after promulgation of the rule; however, they would still be allowed to be filled and used.
17. Further controls on **mid-size industrial boilers** requiring a 60% NOx reduction, making the NOx SIP Call levels apply to boilers of 100-250 mmBtu/hr **statewide**. The Task Force did not support the more expensive 80% reduction option.

18. Further controls greater than the federal CAIR program (Clean Air Interstate Rule) on **electric utilities (coal-fired power plants)**, of which there are six in Northeast Ohio. PT-1 would require additional emission caps based on "Retrofit NOx BACT" (Best Available Control Technology) levels of 0.10 lbs/mmBtu NOx on all six plants for a 33% reduction from the CAIR program. PT-2 would require additional emission caps based on "NOx BACT For New Plants" levels of 0.07 lbs/mmBtu NOx on all six plants for a 53% reduction from the CAIR program. Each would require the installation of additional selective catalytic reduction (SCR) controls on increased units at the various plants. The Task Force recommends that the Ohio EPA be guided by the air-shed modeling for Northeast Ohio and impose further controls on electric utilities (electric generating units - EGUs), using either PT-1 and/or PT-2 as may be deemed necessary. However, the Task Force recommends that such controls be mandated on a **multi-state basis** through Ohio EPA's work with the states of LADCO (Lake Michigan Air Directors Consortium), those states being Ohio, Indiana, Illinois, Michigan, and Wisconsin, because only multi-state NOx controls show an appreciable benefit to Northeast Ohio.
19. Enhancement of underground **gasoline storage tank pressure-valve vents** at gas stations **statewide** by adopting the CARB (California Air Resources Board) EVR (Enhanced Vapor Recovery) Stage I requirements.
20. Enhancement of **Stage II vapor recovery nozzles** at gasoline distribution facilities by adopting the CARB EVR Stage II requirements.
21. High Volume Low Pressure (HVLV) spray guns for **auto body paint sprayers** by adopting more stringent RACT requirements **statewide** based on South Coast Air Quality Management District, California, regulations.
22. Seeking of grant funding for **energy efficiency projects** in Northeast Ohio by applying for the possible categories listed in the federal Energy Policy Act of 2005.
23. More stringent limits for formulation of **industrial surface coatings for point sources** by adopting more stringent RACT regulations, lowering the applicability thresholds, and extending the geographic coverage to **statewide**.
24. More stringent limits for formulation of **paints and varnishes (architectural and industrial maintenance coatings)** by adopting the Ozone Transport Commission model rule **statewide** for a 21% reduction beyond current federal requirements.
25. **NOx Credit Trading Bank**. Such a state-operated program would make the tracking of NOx allowances, offsets, and retirements transparent so that businesses needing NOx offsets could find them. Such a program would also create a monetary value for NOx allowances, encouraging NOx reductions by industry. The program would have to be created by state law and housed in the Ohio EPA offices.

The NOACA Air Quality Public Advisory Task Force tabled, rather than dismissed or recommended, options regarding alternative "clean fuels" including ethanol, biodiesel,

compressed natural gas, electricity, and hydrogen. These fuels will be discussed during the work of the Task Force on the PM_{2.5} SIP.

An option for "Cash For Clunkers" was not supported by the Task Force because of lack of cost-effectiveness and lack of a funding source. It was dropped from final consideration.

In addition to these options, the Task Force will continue the work of the Public Health Forum Work Group toward having one or more public conferences on the public health impacts of air pollution.

Finally, the Task Force will also continue the work of the Long-Range Issues Work Group, which will attempt to map out planning components for continued clean air throughout Northeast Ohio. Many of the options that the Task Force reviewed were clearly unsuitable for implementation before the attainment deadline of June 2010.

The work of the Task Force is available in electronic format at www.noaca.org/sipplan.html

B. BACKGROUND and PROCESS

Nonattainment Status of Northeast Ohio

Ozone:

On April 15, 2004, the eight counties of Northeast Ohio were declared by the United States Environmental Protection Agency (USEPA) to be a moderate nonattainment area under the new federal 8-hour ozone National Ambient Air Quality Standard (NAAQS), set under the federal Clean Air Act. This designation includes the following counties:

Ashtabula
Cuyahoga
Geauga
Lake
Lorain
Medina
Portage
Summit

Ground-level ozone reduces lung function, exacerbating respiratory conditions and making it difficult for the young, the elderly, and those with heart-lung diseases to breathe. Ozone is formed in sunlight from volatile organic compounds (VOCs) and oxides of nitrogen (NOx) in a complex summertime atmospheric reaction.

The Ohio EPA, on behalf of Northeast Ohio, must submit to USEPA an 8-Hour Ozone State Implementation Plan (SIP) by June 2007 with sufficient control measures, plus air-shed modeling, to show attainment of the federal standard by June 2010. Control measures, however, must be in place by June 2009.

SIP Submission:

Ohio EPA is responsible for submitting all SIPs for Ohio. NOACA, through a public stakeholder and committee process, will contribute recommendations for the two SIPs for Northeast Ohio. In Akron, the AMATS Governing Board will also send comments as they relate to Summit and Portage Counties.

Failure to Submit and Failure to Attain:

Failure of the Ohio EPA to submit a valid, timely SIP that demonstrates that attainment will be achieved by 2010 may subject Northeast Ohio to loss of federal highway funds for capacity-adding projects, as well as 2-for-1 offsets for businesses locating or expanding in Northeast Ohio, pursuant to § 179 of the Clean Air Act.

Failure to attain the 8-hour ozone NAAQS by 2010 subjects Northeast Ohio, by operation of law under § 181 of the Clean Air Act, to redesignation as a "serious" nonattainment area, with additional restrictions on businesses and on mobile sources.

NOACA Air Quality Public Advisory Task Force - Process

Ohio EPA, on November 1, 2005, signed a Memorandum of Understanding with NOACA and northeast Ohio's Local Air Agencies, acknowledging NOACA's lead role as a Section 174 agency under the Clean Air Act in coordinating the public involvement process for all 8 counties related to the nonattainment status of Northeast Ohio for both ozone and fine particles (PM_{2.5}).

NOACA established a public stakeholder process with the following charge:

- a. Develop an understanding of Northeast Ohio's air quality issues.
- b. Serve as a forum for public discussion of Northeast Ohio's air quality challenge.
- c. Review and evaluate alternative controls addressing Northeast Ohio's sources of ozone precursors and particulate matter pollution.
- d. Make recommendations for attaining federal clean air standards for ozone and particulate matter to the NOACA Governing Board.

The NOACA Air Quality Public Advisory Task Force is made up of the following individuals, with Dr. Nora Nock of Case Western Reserve University as Chair:

Betty	Blair	Lorain County Commissioner (Alt: Kate Hoffman)
Michael	Bower	Cleveland Municipal School District
Joseph	Calabrese	Greater Cleveland Regional Transit Authority (Alt: Richard Enty)
Pat	Carey	Greater Ohio
Lydia	Champlin	Mayor, City of Chagrin Falls
Robert	Dominak	Northeast Ohio Regional Sewer District
Theodore	Esborn	McDonald Hopkins. LPA
Raymond	Evans	First Energy
Kathleen	Fagan	Community Health Partners, Lorain /Environmental Health Watch
Robert	Farley	Team NEO
Colin	Johnson	Cuyahoga County Board of Health
Linda	Kimble	Cleveland Clean Air Century Campaign
Phil	Lane	The Center for Regional Economic Issues
David	Lang	Cleveland Clinic Foundation
Robert	Leidich	BP Products
William	Margalis	Council, City of Wickliffe

Sharon	Martin	League of Women Voters
Tim	McCormack	Cuyahoga County Planning Commission
Ryan	McKenzie	EcoCity Cleveland
Richard	Nemeth	City of Cleveland; Division of Air Quality; Dept of Public Health
Brian	Newbacher	American Automobile Association
Nora	Nock	CWRU Department of Epidemiology & Biostatistics
Caris	Post	American Lung Association of Ohio
Mary	Samide	Geauga County (Alt: Mary Bramstedt)
Jason	Segedy	Akron Metropolitan Area Transportation Study
Robert	Shiner	Mayor, City of Mentor
Michael	Supeck	Medina County
Chris	Trepal	Earth Day Coalition (Alt: David Beach)
JoAnn	Uhlik	Greater Cleveland Partnership
Richard	Zavoda	Mittal Steel

The Task Force also had more than 50 additional Interested Observers, many of whom actively participated in the process and all of whom tracked the work of the Task Force electronically via email and the NOACA website.

The Task Force met on the following dates, each time at the NOACA offices:

- May 25, 2005
- July 25, 2005
- September 28, 2005
- October 27, 2005
- December 6, 2005
- March 1, 2006
- March 29, 2006
- April 26, 2006
- May 5, 2006

The Task Force established the:

- Mobile Source Work Group
- Area Source Work Group
- Point Source Work Group
- Long-Range Strategies Work Group
- Public Health Forum Work Group

The Work Groups met approximately every 3 weeks from August 2005 to April 2006. They will continue to meet through the fall of 2006 to address PM_{2.5}.

The Task Force employed the following evaluation criteria to assess potential options for Northeast Ohio:

- Quantifiable
- Enforceable
- VOC Reductions in Tons Per Day
- NOx Reductions in Tons Per Day
- Technically Possible
- Successful Implementation Elsewhere
- Require State Legislation/ State Rules/ Local Ordinances
- Costs Per Ton of Pollutant Removed
- Costs in Other Units
- Economic Investment Required
- Economic Benefit or Detriment
- Health Benefit
- Other Benefits or Detriments
- Behavioral Change Required
- 2009 Timing Requirement
- Long-Term Effect
- Additional Comments or Concerns

The 80 options studied by the Task Force, using these criteria, appear in Appendix A in order of their priority following Task Force evaluation.

The Task Force, through its Work Groups, performed a literature review and examined the work performed by the Lake Michigan Air Directors' Consortium (LADCO), as well as studying the work being done in other nonattainment areas across the nation. The Task Force then reviewed options for recommendations to the Ohio EPA for inclusion in the SIP for the 8-Hour Ozone NAAQS.

The Task Force studied not only creditable SIP measures for Ohio EPA to include, but also "weight of evidence" measures, as described by USEPA's Phase II Ozone Implementation Rule, to show the good faith of the citizens of Northeast Ohio in moving forward toward clean air and better quality of life and to demonstrate that the region will likely make attainment by the June 2010 deadline.

The Task Force, through NOACA staff, performed an informal survey of local government entities to see what "good faith" efforts might already exist, in order to build upon those and to see what measures might qualify for submittal along with the SIP. See "Weight of Evidence" below. See, also, the results of the survey in the Appendices to the Mobile Source Work Group Final Report (Appendix B).

Target Goal for Northeast Ohio

Volatile organic compounds (VOCs) combine with oxides of nitrogen (NOx) in hot sunlight during the summer months, through a complex photochemical reaction, to form ground-level ozone. Ohio EPA is estimating that Northeast Ohio's moderate nonattainment area for 8-hour ozone would have to reduce its VOCs by 25% of the 2009 projections in order to come into attainment, coupled with a statewide reduction in NOx of 15%.

This goal, as stated by Ohio EPA, is approximately:

65 tons/day VOCs (local reduction in Northeast Ohio) and
240 tons/day NOx (statewide reduction)

Ohio EPA states that VOCs reductions taken locally produce a corresponding ozone reduction. However, NOx controls must be statewide or even multi-state-wide to be effective.

Air-Shed Modeling

The current standard for ozone is an 8-hour average, for which the 3-year average of the 4th highest monitor reading cannot exceed 85 parts per billion (ppb). To predict whether Northeast Ohio will attain the standard by June 2010, several parallel air-shed photochemical grid modeling efforts are ongoing. These include work done by the Lake Michigan Air Directors' Consortium (LADCO), working on behalf of the states of Ohio, Indiana, Illinois, Wisconsin, and Michigan.

Another modeling effort is being undertaken directly for NOACA by Ohio University. As with the LADCO results, no collection of controls yet shows Northeast Ohio in attainment by June 2010. However, Ohio University is pursuing changes to the emissions inventory and alternative future year projections that show the region closer to the 85 ppb standard than the LADCO results. Ohio University is studying the impact of local economic and demographics factors to "grow" emissions to 2010 in a more realistic way than that previously used by LADCO. Ohio University and NOACA staff are currently working with LADCO to potentially include the assumptions from the Ohio University/NOACA effort into the official LADCO Round 5 model run.

Weight of Evidence

USEPA's Phase II Ozone Implementation Rule for the development of SIPs allows "weight of evidence" arguments to be made with the submission of a SIP where the accompanying modeling falls within the range of 83 - 87 ppb. It appears that the results from Northeast Ohio's modeling will fall within this range.

When the "weight of evidence" submission is made, many voluntary programs and "good faith efforts" in the nonattainment area can be considered by USEPA in determining whether the SIP is likely to bring the area into nonattainment by the required 2010 deadline.

Consequently, many measures, even voluntary ones, may have value to the overall SIP effort, even if they do not equal the currently estimated total of tons of air pollution needed to be reduced.

Health Effects

The NOACA Air Quality Public Advisory Task Force did not undertake its own local study of the health effects of ozone since it is USEPA's responsibility to determine health safety levels under the federal Clean Air Act. When USEPA set the new 8-hour standard, it did so based on credible, peer-reviewed scientific evidence that showed the standard was necessary to protect public health. The use of peer-reviewed data is part of the process that USEPA is mandated to follow under the Clean Air Act in setting health standards.

The 8-hour standard was challenged in the federal courts over the course of seven years, after which USEPA was directed to designate areas that did not attain the new standard. Northeast Ohio was identified as not meeting the new standard.

The Task Force recognized that there is a lack of information among Northeast Ohio's residents regarding the region's current air quality status. The Task Force felt strongly that a more visible public education and outreach effort should be undertaken regarding the effect of ozone on public health. It established the Public Health Forum Work Group to focus on illustrating the severity of Northeast Ohio's air quality problem. The Work Group's efforts will continue through 2006 as the Task Force studies particulate matter. The Work Group is gathering national studies related to both ozone and fine particles.

C. OZONE SIP OPTIONS

Source of Data

LADCO: The NOACA Air Quality Public Advisory Task Force relied on research performed by the Lake Michigan Air Directors' Consortium (LADCO), which serves the states of Ohio, Indiana, Illinois, Michigan, and Wisconsin.

LADCO was established in 1990 by the states of Illinois, Indiana, Michigan, and Wisconsin. In 1991, the 4 states and USEPA entered into a Memorandum of Agreement that established LADCO as the organization to oversee the technical analysis of ozone formation in the Lake Michigan area and to develop a shared strategy for the reduction of ozone and ozone precursors.

In March 2004, the states signed a new Memorandum of Agreement, which added the state of Ohio as a member. The main purpose of LADCO is to provide technical assessments for and assistance to its member states on problems of air quality; and to provide a forum for its member states to discuss air quality issues. LADCO's primary geographic focus is the area encompassed by its member states and any areas that affect air quality in its member states.

LADCO performed analyses in-house, using its staff and the staff of the 5 states that it serves. The analyses covered mobile, point, and area sources. In addition, LADCO contracted research work to MACTEC (a consultant) on point and area sources, and to ENVIRON (a consultant) on mobile sources.

MACTEC produced a series of "white papers" on point and area sources after surveying air pollution measures adopted in various states across the country. ENVIRON produced a report on mobile source options, including on-road, off-road, marine, aircraft, and rail options, based upon information from its nationwide literature survey.

All research reports and "white papers" were critiqued through a public review process involving the 5 states, the USEPA, and participating stakeholders, which included affected private sector businesses. Each paper was revised following the comment periods and then re-published.

LADCO, with the help of the 5 states and the stakeholders, has produced 11 revisions to the emissions inventory for the 5-state region (Base A - Base K) and is working on the 12th iteration (Base L), striving for ever-greater accuracy. LADCO has produced 4 rounds of photochemical grid modeling to accompany the emissions inventory revisions, in order to provide the states with an assessment of how close each will be to attainment in 2010. "Sensitivity runs" including batches of potential air pollution control options have also been performed by LADCO for the states. Such runs provide information on the amount of reduction that might be gained by the various combinations of options as applied.

In assessing the financial costs and air pollution emissions reductions associated with the various mobile source options, the Task Force relied on data from LADCO's subcontractor, ENVIRON.

The Task Force relied on research performed by LADCO and by MACTEC in assessing the point and area source options, including both air pollution reduction estimates and estimates of financial cost associated with each option.

NOACA, AMATS, and ODOT: The NOACA Air Quality Public Advisory Task Force also relied on Mobile 6 modeling runs performed by NOACA, the Akron Metropolitan Area Transportation Study (AMATS), and the Ohio Department of Transportation (ODOT) in assessing air pollution impacts related to the mobile source options, wherever possible. The Mobile 6 modeling work provided more region-specific data than was possible through LADCO.

The Task Force also relied on air emission calculations made by NOACA staff using emission factors generated by Mobile 6 for Northeast Ohio, which were then used to make assumptions about impacts from various scenarios, for example, the amount of NO_x reduced by implementing truck anti-idling restrictions at the Port of Cleveland.

STAKEHOLDERS: Finally, the Task Force relied on data provided by the participating stakeholders in Northeast Ohio during the public process.

Reports

All the reports and background information of the NOACA Air Quality Public Advisory Task Force can be found at www.noaca.org/sipplan.html.

For further detail on each of the options described in this Report, refer to the appropriate Option Number in each of the Work Group Reports contained in Appendices B, C, and D, as well as the overall ranking in Appendix A.

Acronyms

In the following analyses, options were numbered with an initial "MO" for Mobile Source, an initial "AR" for Area Source, and an initial "PT" for Point Source.

In addition, the following acronyms are used. They can also be found in Appendix E.

AIM - Architectural and industrial maintenance
ALAPCO – Association of Local Air Pollution Control Officials
AMATS - Akron Metropolitan Area Transportation Study
APU – Auxiliary power unit
AR - Area source option
ASM - Accelerated Simulation Mode
BAAQMD - Bay Area Air Quality Management District (California)
BACT - Best available control technology
CAIR - Clean Air Interstate Rule
CARB - California Air Resources Board
CFR – Code of Federal Regulations
CHP – Combined heat and power
CMAQ - Congestion Mitigation & Air Quality funds
CNG - Compressed natural gas
CO - Carbon monoxide
DERA – Diesel Emission Reduction Act
DPF - Diesel particulate filter
EAC - Environmental Advisory Committee (NOACA)
EGU - Electric generating unit
EGR - Exhaust gas recirculation
EVR - Enhanced vapor recovery
GDF - Gasoline distribution facility
GSE - Ground support equipment (airport)
HDDV - Heavy duty diesel vehicle
HDGV - Heavy duty gasoline vehicle
HPLV - High pressure low volume
ICI – Industrial, commercial, and institutional
LADCO - Lake Michigan Air Directors' Consortium
LDGV - Light duty gasoline vehicle
LEED - Leadership in Energy and Environmental Design
MO - Mobile source option
MY - Model year
NAAQS - National Ambient Air Quality Standards
NO_x - Oxides of nitrogen
ODOT - Ohio Department of Transportation
OEM - Original equipment manufacturer
O.R.C. - Ohio Revised Code
OTC - Ozone Transport Commission

PFC - Portable fuel container (gas can)
PM - Particulate matter
PSI - Pounds per square inch
PT - Point source option
RACT - Reasonably available control technology
RFG – Reformulated gasoline
RVP - Reid vapor pressure, a measure of gasoline volatility
SAFETEA-LU - Safe, Accountable, Flexible, Efficient Transportation Equity Act - A
Legacy for Users (2005)
SCAQMD - South Coast Air Quality Management District (California)
SCR - Selective catalytic reduction
SFY – State fiscal year
SIP - State implementation Plan
SOV – Single occupancy vehicle
STAPPA – State and Territorial Air Pollution Program Administrators
TIP - Transportation Improvement Program
TPD - Tons per day
TPY – Tons per year
UST - Underground storage tank
VALE - Voluntary Airport Low Emission program
VMT – Vehicle miles traveled
VOC - Volatile organic compound

Final Options

The following lists represent the 8-Hour Ozone options chosen by the NOACA Air Quality Public Advisory Task Force through voting, each of which received a weighted score of 35 or more. (Points were awarded during voting for an option being chosen. Additional points were awarded for an option being chosen as a "Top Five" selection.)

Identifying numbers refer to the numbering in the Final Reports, which are available at: www.noaca.org/sipplan.html and which are appended to this Report. (See Appendix B, C, and D.)

The air pollution reductions for volatile organic compounds (VOCs) and oxides of nitrogen (NOx) are shown for the Northeast Ohio nonattainment area only (Ashtabula, Geauga, Cuyahoga, Lake, Lorain, Medina, Portage, and Summit Counties.)

The options are listed in priority order, as set by the Task Force voting, after being divided between "Mobile Source Options" and "Point & Area Source Options."

Mobile Source Options

MO-1 and MO-2 - Low-Reid Vapor Pressure (RVP) gasoline of 7.8 psi for the summer of 2009, followed by a low-RVP gasoline of 7.0 psi for the summer of 2010 and every summer thereafter until the standard is attained.

7.8 psi VOCs reduced:	5.25 tons per day (tpd)
7.8 psi NOx reduced:	0.32 tpd
Cost:	\$0.01 per gallon at refinery
Cost per ton of pollutant removed	\$7,367 VOCs
7.0 psi VOCs reduced:	8.2 tpd
7.0 psi NOx reduced:	0.48 tpd
Cost:	\$0.6 - 3 cents per gallon at refinery
Cost per ton of pollutant removed	\$14,150 VOCs

Note: The Task Force realizes that more air quality benefit can be obtained by 7.0 psi gasoline than by 7.8 psi gasoline, but also realizes that preparation time is needed by refineries to be able to provide 7.0 psi. Consequently, a phased-in approach was approved. Costs "at the pump" could not be obtained.

MO-25 - **Anti-idling policies** for cars, trucks, buses, and off-road equipment across Northeast Ohio. Although these could be implemented voluntarily by policy at individual agencies and employer, or through municipal ordinance, or by state law, the Task Force recommends that they be set "at the state policy level" (whether by state law or by state air pollution regulation) to affect both public and private vehicles, using a reasonable approach such as that contained in the USEPA Model Anti-Idling Ordinance.

As an example, for 500,000 vehicles of all types, eliminating 10 minutes of idling from each vehicle per day:

VOCs reduced:	1.466 tpd
NOx reduced:	0.402 tpd
Cost:	Cost savings (if no auxiliary power units are purchased)
Cost per ton	Cost savings through less fuel usage

As a second example, for 5,000 heavy-duty diesel trucks, eliminating 30 minutes of idling from each truck per day:

VOCs reduced:	1.01 tpd
NOx reduced:	0.10 tpd
Cost:	Cost savings (if no auxiliary power units are purchased)
Cost per ton	Cost savings through less fuel usage

Note: This recommendation also includes:

- AR-1, Anti-Idling Policy at the Port of Cleveland for trucks;
- AR-3, Anti-Idling Policy at Cleveland-Hopkins Airport for all buses, taxis, and cars;
- AR-6, Anti-Idling at Railroad Switchyards through the use of auxiliary power units on locomotives or changes in practices.

MO-14 - **Voluntary trip reduction programs** across Northeast Ohio, including increased transit use, carpooling and Rideshare, compressed work weeks, telecommuting, conference calls and other "virtual meetings," trip combining and increased efficiency in routing and deliveries, and commuting alternatives such as bicycling and walking.

As an example, for 10% of drivers in the NOACA 5 counties taking mass transit and 10% of drivers in the NOACA 5 counties working at home instead of driving to work:

VOCs reduced:	2.12 tpd
NOx reduced:	4.63 tpd
Cost:	Cost savings
Cost per ton	Cost savings through less fuel usage

Note: The Task Force did not support mandatory trip reduction programs, either for government agencies or for employers of a certain size.

MO-20 - **Truck stop electrification** of the 3 large truck stops in Northeast Ohio (2 in Medina County and 1 in Cuyahoga County). Such electrification services, provided by a private contractor such as IdleAire, would allow diesel tractor-trailer rigs to turn off their engines while parked and, at the same time, "plug in" for an hourly fee to receive lights, heat, power, computer hook-ups, air conditioning, and other necessary services in the truck's cab.

VOCs reduced:	0.02 tpd
NOx reduced:	0.38 tpd
Cost:	\$3,273,200
Cost per ton	\$44,838 VOCs (over 10 years)
	\$ 2,359 NOx (over 10 years)

Note: It is believed that the TCA truck stop in Seville, Ohio, will be electrified in the summer of 2006 through the private funds of TCA and the services of IdleAire.

MO-16 and MO-17 **Continued support for ODOT's Intelligent Transportation System (ITS)** in the Cleveland area and the Akron area, which will relieve traffic congestion through vehicle counting, electronic signage, and radio broadcasts.

For the Cleveland area:

VOCs reduced:	0.549 tpd
NOx reduced:	(-0.071) tpd
Cost:	\$28 million
Cost per ton	\$23,330 VOCs (over 6 years)

For the Akron area:

VOCs reduced:	0.211 tpd
NOx reduced:	(-0.093) tpd
Cost:	\$14.4 million
Cost per ton	\$31,162 VOCs (over 6 years)

Note: NOx shows an increase because diesel trucks, when a traffic jam is alleviated, are able to return to speeds higher than 45 mph, after which NOx emissions increase with speed.

MO-28- and MO-27 - **Increased use of alternative fuels such as biodiesel and ethanol.**

Note: Because neither biodiesel nor ethanol shows an ozone-formation benefit, the Task Force will study biodiesel and ethanol again for recommendation in the PM_{2.5} SIP, where significant benefits are anticipated in particulate matter emissions. The Task Force noted that there may be as many as 36,000 "flex-fuel vehicles" (FFVs) in Northeast Ohio capable of using 85% ethanol (E85); however E85 has a fuel penalty in terms of miles per gallon. Recommendations will be made to the NOACA Governing Board in early 2007.

MO-5 - E-Check Enhancements, **Adoption of the Acceleration Simulation Mode (ASM) 2525 Final Standards for Pre-1996 Cars** not having onboard diagnostic (OBD) testing. These models are currently tested using dynamometers.

VOCs reduced:	0.31 tpd
NOx reduced:	0.43 tpd
Cost:	\$2.8 million to the car owners in increased repair costs
Cost per ton	\$24,745 VOCs \$17,840 NOx

Note: A companion option for "Cash For Clunkers" was not supported by the Task Force because of lack of cost-effectiveness and lack of a funding source.

MO-15 - Continued support for **bus replacement programs** such as those already contained in the NOACA and AMATS Transportation Improvement Programs (TIPs).

VOCs reduced:	0.001 tpd
NOx reduced:	0.52 tpd
Cost:	\$240,000 per bus - less for engine replacements
Cost per ton	\$5,507 NOx

MO-33 - **Transit incentives (free rides)** to encourage use of mass transit on high air pollution days.

VOCs reduced:	0.003 tpd (for each day declared)
NOx reduced:	0.002 tpd (for each day declared)
Cost:	Unknown (loss of full day's revenue to each transit agency) Example: \$40,000 per day for Greater Cleveland RTA
Cost per ton	Depends on number of high air pollution days declared.

MO-22 - Greater use of **transit centers** to make transit more attractive to riders.

One example is already in the NOACA TIP (W. 3rd St., Cleveland):

VOCs reduced:	0.45 tpd
NOx reduced:	0.33 tpd
Cost:	\$5 million per center
Cost per ton	\$3,056 VOCs (over 10 years)
	\$4,167 NOx (over 10 years)

Note: This recommendation also includes:

MO-23 - Park & Ride Lot Enhancements

MO-24 - Transit Waiting Environment Improvements

MO-21 - Continued support for **traffic signal synchronizations** such as those already contained in the NOACA and AMATS TIPs.

Current NOACA and AMATS TIPs show:

VOCs reduced:	0.125 tpd
NOx reduced:	0.038 tpd
Cost:	\$30.2 million
Cost per ton	\$66,150 VOCs (over 10 years)
	\$217,599 NOx (over 10 years)

MO-12 - **NOx retrofits for diesel vehicles** specifically by using selective catalytic reduction (SCR) devices on on-road trucks.

For a fleet of 100 trucks, as an example:

VOCs reduced:	0 tpd
NOx reduced:	0.4 tpd
Cost:	\$2.75 million for 100 trucks
Cost per ton	\$3,139 NOx (over 8 years)

Note: The Task Force will continue to study all diesel retrofit options for possible inclusion in the PM_{2.5} SIP. Recommendations will be made in early 2007.

MO-19 - **Additional enforcement of existing speed limits** specifically those where cars and trucks are exceeding 55 mph in a 55 zone or 60 mph in a 60 zone.

VOCs reduced:	(-1) tpd
NOx reduced:	2 tpd
Cost:	Cost savings through less fuel usage and increased ticket revenue
Cost per ton	Cost savings

As an example, the hiring of 10 additional freeway patrol officers would cost approximately \$750,000 total. If each issued just 8 tickets per shift, at \$100 per ticket, and worked 236 shifts per year, a total of \$188,800 would be recouped by each officer each year, for a total revenue stream of \$1,888,000 per year.

Note: The emissions reductions/increases are the result of NOACA Mobile 6.2 modeling that shows that some drivers may begin to avoid the freeways and begin using side streets, thus increasing their VOC output. However, Environ/LADCO modeling results show VOC and NOx reductions for both cars and trucks when speed is reduced from 65 to 55 mph.

AR-2 - **Replacement of ground-support vehicles** at Cleveland-Hopkins International Airport with electric, CNG, or hydrogen vehicles. Approximately 100 of the 300 ground-support vehicles at Cleveland-Hopkins are municipally owned.

VOCs reduced:	Unknown
NOx reduced:	Unknown
Cost:	Depends on type of vehicles chosen for replacement
Cost per ton	Depends on type of vehicles chosen for replacement

Note: Cleveland-Hopkins has already replaced emergency vehicles with new vehicles capable of "quick start" without constant idling, and is in the process of replacing older diesel snowplows so that they have the same capability, thus reducing NOx output.

Point Source and Area Source Options

PT-9 - **Cold cleaners/degreasing operations.**- Adopt Chicago-Metro East Regulations on a **statewide** basis.

Northeast Ohio air pollution reductions:

VOCs reduced:	8 tpd
NOx reduced:	0 tpd
Cost:	\$4.3 million
Cost per ton	\$1,400

PT-7 - More stringent limits for formulation of **industrial surface coatings for area sources** by creating more stringent RACT (Reasonably Available Control Technology) rules, lowering the applicability thresholds, and extending geographic coverage to **statewide**.

Northeast Ohio air pollution reductions:

VOCs reduced:	13 tpd
NOx reduced:	0 tpd
Cost:	\$0.5 - 24 million
Cost per ton	\$100 - 5,000

PT-12 - More stringent limits for formulation of **consumer and commercial products** by adopting the Ozone Transport Commission Model Rules **statewide** with additional product coverage and more stringent VOC limits, a 14.2% reduction beyond current federal regulation.

Northeast Ohio air pollution reductions:

VOCs reduced:	4 tpd
NOx reduced:	0 tpd
Cost:	\$1.2 million
Cost per ton	\$800

Note: The Task Force did not support the more expensive and more stringent standard set in California by the California Air Resources Board.

AR-13 - Improve design of portable fuel containers (**gas cans**) by **adopting the Ozone Transport Commission Model Rule statewide**, for an 18% reduction in 2009 and a 54% reduction in 2015, assuming a 10% turnover per year, starting in 2007. No "old style" gas cans would be available for purchase in Ohio after promulgation of the rule; however, they would still be allowed to be filled and used.

Northeast Ohio air pollution reductions:

VOCs reduced:	4 tpd
NOx reduced:	0 tpd
Cost:	\$2 - 3 million
Cost per ton	\$250 - 480

PT-3 - Further controls on **mid-size industrial boilers** requiring a 60% NOx reduction, making the NOx SIP Call levels apply to boilers of 100-250 mmBtu/hr **statewide**.

Northeast Ohio air pollution reductions:

VOCs reduced:	0 tpd
NOx reduced:	2 tpd
Cost:	\$0.2 - 0.7 million
Cost per ton	\$280 - 1,300

Note: The Task Force did not support the more expensive 80% reduction option.

PT-1 and PT-2 - Further controls greater than the federal CAIR program (Clean Air Interstate Rule) on **electric utilities (coal-fired power plants)**, of which there are six in Northeast Ohio.

PT-1 would require additional emission caps based on "Retrofit NOx BACT" (Best Available Control Technology) levels of 0.10 lbs/mmBtu NOx on all six plants for a 33% reduction from the CAIR program. Pt-2 would require additional emission caps based on "NOx BACT For New Plants" levels of 0.07 lbs/mmBtu NOx on all six plants for a 53% reduction from the CAIR program. Each would require the installation of additional selective catalytic reduction (SCR) controls on increased units at the various plants.

The Task Force recommends that the Ohio EPA be guided by the air-shed modeling for Northeast Ohio and impose further controls on electric utilities (electric generating units -

EGUs), using either PT-1 and/or PT-2 as may be deemed necessary. However, the Task Force recommends that such controls be mandated on a **multi-state basis** through Ohio EPA's work with the states of LADCO (Lake Michigan Air Directors Consortium), those states being Ohio, Indiana, Illinois, Michigan, and Wisconsin, because only multi-state NOx controls show an appreciable benefit to Northeast Ohio.

Northeast Ohio air pollution reductions for PT-1:

VOCs reduced:	0 tpd
NOx reduced:	14 tpd
Cost:	\$4 - 14 million, according to Environ/LADCO
Cost per ton	\$700 - 1,600

Five-state (Ohio, Indiana, Illinois, Michigan, and Wisconsin) reductions for PT-1:

VOCs reduced:	0 tpd
NOx reduced:	337 tpd
Cost:	\$86 - 331 million, according to Environ/LADCO
Cost per ton	\$700 - 1,600

Note: Only capital construction costs are included, not operating and maintenance, which the Task Force notes may be high, according to the EGU industry. The Task Force also notes that the EGU industry states that additional SCRs cannot be manufactured, purchased, or installed before 2011, which would be too late to affect the 8-Hour Ozone attainment deadline of June 2010.

PT-16 - Enhancement of underground **gasoline storage tank pressure-valve vents** at gas stations **statewide** by adopting the CARB (California Air Resources Board) EVR (Enhanced Vapor Recovery) Stage I requirements.

Northeast Ohio air pollution reductions:

VOCs reduced:	2 tpd
NOx reduced:	0 tpd
Cost:	\$0 - 2 million
Cost per ton	\$0 - 2,100

Note: Northeast Ohio, but not the state, already has Stage I. However, even Northeast Ohio does not have the CARB enhanced tank vents.

PT-17 - Enhancement of **Stage II vapor recovery nozzles** at gasoline distribution facilities by adopting the CARB EVR Stage II requirements.

Northeast Ohio air pollution reductions:

VOCs reduced:	2 tpd
NOx reduced:	0 tpd
Cost:	\$0.5 - 10 million
Cost per ton	\$840 - 13,400

Note: Northeast Ohio, but not the state, already has Stage II. However, even Northeast Ohio does not have the California-design nozzles.

PT-15 - High Volume Low Pressure (HVLV) spray guns for **auto body paint sprayers** by adopting more stringent RACT requirements **statewide** based on South Coast Air Quality Management District, California, regulations.

Northeast Ohio air pollution reductions:

VOCs reduced:	4 tpd
NOx reduced:	0 tpd
Cost:	\$11 million
Cost per ton	\$7,200

PT-21 - Seeking of grant funding for **energy efficiency projects** in Northeast Ohio by applying for the possible categories listed in the federal Energy Policy Act of 2005.

Northeast Ohio air pollution reductions:

VOCs reduced:	Unknown
NOx reduced:	Unknown
Cost:	Receipt of grant funds
Cost per ton	Receipt of grant funds

PT-8 - More stringent limits for formulation of **industrial surface coatings for point sources** by adopting more stringent RACT regulations, lowering the applicability thresholds, and extending the geographic coverage to **statewide**.

Northeast Ohio air pollution reductions:

VOCs reduced:	2 tpd
NOx reduced:	0 tpd
Cost:	\$0.07 - 3.5 million
Cost per ton	\$100 - 5,000

PT-10 - More stringent limits for formulation of **paints and varnishes (architectural and industrial maintenance coatings)** by adopting the Ozone Transport Commission model rule **statewide** for a 21% reduction beyond current federal requirements.

Northeast Ohio air pollution reductions:

VOCs reduced:	4 tpd
NOx reduced:	0 tpd
Cost:	\$37 million
Cost per ton	\$6,500

PT-30 - **NOx Credit Trading Bank**. Such a state-operated program would make the tracking of NOx allowances, offsets, and retirements transparent so that businesses needing NOx offsets could find them. Such a program would also create a monetary value for NOx allowances, encouraging NOx reductions by industry. The program would have to be created by state law and housed in the Ohio EPA offices.

NOx reduced:	Unknown
Cost:	Cost of additional Ohio EPA staff, computer hardware and software

The Task Force **expressed no comment** on other new **VOC and NOx rules requiring Reasonably Available Control Technology (RACT)** at industries in Northeast Ohio, to be determined by the Ohio EPA after study, because the Task Force saw no drafts of such rules, could not study their air impacts or their costs, and did not study the categories independently. At the time of the printing of this Report, the categories might include the following:

Additional NOx RACT - Ohio EPA possibilities

- 1.) Process heaters, e.g., for chemical or steel processes
- 2.) Large stationary internal combustion engines, either gasoline or diesel
- 3.) Combustion turbines, often at electric generating units, requiring either a change in operating practices or a change in fuels
- 4.) Asphalt batch plants
- 5.) Other sources, after top-down RACT study -- glass furnaces, etc.

Additional VOC RACT - Ohio EPA possibilities

- 1.) Synthetic organic compound manufacturing - Northeast Ohio only
- 2.) Organic compound batch processes - Northeast Ohio only
- 3.) Wood manufacturing - Northeast Ohio only
- 4.) Industrial wastewater (to capture petroleum, etc.) - Northeast Ohio only
- 5.) Aerospace industry, including repair facilities - Northeast Ohio only
- 6.) Shipbuilding and boat building and repair - Northeast Ohio only
- 7.) Bakeries (large), with extended compliance deadline - Northeast Ohio only
- 8.) Plastic parts coating (often auto subcontractors) - Northeast Ohio only
- 9.) Volatile organic liquid storage tanks (large) - Northeast Ohio only
- 10.) Industrial solvent cleaning - Northeast Ohio only
- 11.) Offset lithography - Northeast Ohio only
- 12.) Other sources, after top-down RACT study - case by case

D. CONCLUSION

The NOACA Air Quality Public Advisory Task Force concludes that the options described in Section C above are the most feasible, cost-effective, and realistic set of measures that could be adopted to help to bring Northeast Ohio into attainment of the 8-Hour Ozone NAAQS by June 2010.

The Task Force realizes that photochemical grid air-shed modeling of similar measures, and even more stringent measures, does not yet show Northeast Ohio as reaching timely attainment. However, the Task Force believes that full implementation of the options studied and described, along with refinements to the air-shed modeling, will produce both a valid, timely SIP and actual attainment in 2010.

The Task Force will continue to study and re-visit the options contained in this Report as it begins its work on the PM_{2.5} SIP, taking into account the benefits of various options on the two pollutants combined, ozone and PM_{2.5}.

For further detail on each of the options described in this Report, refer to the appropriate Option Number in each of the Work Group Reports contained in Appendices B, C, and D, as well as the overall ranking in Appendix A.