

## NOACA Air Quality Public Advisory Task Force

### Working Document - Revised to Reflect Final Ozone Recommendations Made at the 5/5/06 Meeting

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.

Identifying numbers refer to the numbering in the Final Reports, which are available at: [www.noaca.org/siplan.html](http://www.noaca.org/siplan.html).

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, and 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 VOCs reduced:	8.2 tpd
7.0 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.

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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.

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.

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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.

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.

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**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.

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**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<sub>2.5</sub> 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.

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MO-5 - E-Check Enhancements, **Adoption of the 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.

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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

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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.

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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

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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)

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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<sub>2.5</sub> SIP. Recommendations will be made in early 2007.

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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.

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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 snow plows 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

**Ohio EPA rule?** Under consideration for statewide. Substitute solvents may be allowed in order to meet the limits.

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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  
**Ohio EPA rule?** Under consideration - statewide.

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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  
**Ohio EPA rule?** Under consideration - statewide.

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

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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

**Ohio EPA rule?** Yes - statewide - using California design standards (California Air Resources Board). Already proposed.

Note: The Task Force did not support increased funding in order to provide the new gas cans (for free or at a reduced cost) on an accelerated basis to consumers for faster turnover.

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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

**Ohio EPA rule?** Under consideration, but stringency level unknown.

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

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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
<b>Ohio EPA rule?</b>	Under consideration, but stringency level unknown.

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.

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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

**Ohio EPA rule?** Under consideration - statewide.

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

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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

**Ohio EPA rule?** No.

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

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PT-15 - High Volume Low Pressure (HVL) 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

**Ohio EPA rule?** Under consideration - statewide.

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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

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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
<b>Ohio EPA rule?</b>	Under consideration - statewide.

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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
<b>Ohio EPA rule?</b>	Under consideration - statewide.

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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.

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The Task Force **expresses 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 has seen no drafts of such rules, could not study their air impacts or their costs, and did not study the categories independently. 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, possibly statewide
- 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