

Environmental Livability Index

Is the air clean? Is the water safe to drink? Is pollution getting better or worse?

To help local environmental leaders answer these and other questions about their community's environment, Environmental Defense developed this Environmental Livability Index. For the past two years, Environmental Defense has worked with local environmental groups throughout the Great Lakes Region to identify important environmental issues to track. Working with three pilot communities—Cleveland, Dayton, and Milwaukee—Environmental Defense staff collected, analyzed, and organized data to evaluate current environmental conditions, understand the source of the problem, and determine whether existing local programs were sufficient.

This report covers air quality in the Cleveland/Cuyahoga County area. Subsequent reports will be issued on other aspects of the local environment, including water quality, industrial pollution, cleanup needs, childhood lead poisoning, and transportation impacts. This series of reports is intended to provide insight into conditions and activities in the Cleveland area, as well as provide a template for other communities to do their own measurement. The data used in this evaluation is readily available from online sources, such as Environmental Defense's Scorecard (<http://www.scorecard.org>), or from federal, state and local agencies.

For each issue we include the following information –

- Local environmental conditions. We raise key questions such as – Is the air clean? Is it getting better or worse? To the extent we can answer these questions with existing data, we do. If not, we point out what additional information is needed to understand the state of the environment.
- Sources of the problem. To help understand the problem and what to do about it, we include information on the source of the problem, such as what facility, or facilities are discharging the most pollution into the air.
- Local programs to address the problems. We explain what local authorities are doing to prevent pollution and how that compares to other similarly-sized communities and model programs elsewhere. We also include lists of organizations and people to contact for further information on potential solutions.

Why Measure?

Measuring environmental progress focuses attention on issues that may otherwise be ignored, the "what gets measured, gets done" notion. For example, political leaders devote a lot of attention and resources to ensure that the Gross National Product will go up, because, for better or worse, it is perceived to measure something the public cares about (i.e., economic health). Likewise, government agencies concentrate on reducing end-of-pipe pollution, which is routinely measured and reported, but overlook opportunities to prevent the pollution in the first place.

Even a negative report card can lead to positive results. In Chattanooga, Tennessee a bad grade on air quality back in 1969 was, according to a city councilman, the "heart attack" that turned the various stakeholders' attention to pollution problems. The city is now held up as a model of environmental sustainability, with reduced air and water pollution and less congestion.

We hope that other groups can use this report as a model for doing similar evaluations of their own communities. Such an evaluation can help create greater public awareness of key environmental issues and increase accountability among local officials for better environmental gains. The Index is designed to be easily updated or applied to other communities. We make it clear where we got the data and why it is important. Groups may want to add or modify the measures to reflect unique environmental characteristics or ones that directly capture social and economic sustainability goals.

A Word about the Data.

During the course of this project we made a number of decisions on which measures and data we could use. Our goal early on was to identify a common set of measures that are relevant and applicable to most urban areas, that can be quantified, and that are understandable to the public. We found several measures that we wanted to include, but were unable to because of data problems. Even data that passed our scrutiny is far from perfect. Key limitations are noted in the text. We would welcome suggestions on better data sources or alternative measures. Indeed some of the groups involved have shown an interest in working toward better and more targeted data collection to be able to answer fundamental questions about our environment.

Despite the inevitable limitations of data-rich projects such as this, the measures and communication tools provided in this Index can be valuable to guide local work toward a more livable environment. As in the case of Chattanooga, these kinds of measures can also be part of a vision for what a community hopes to achieve, helping to create a common understanding of the problems and motivating local change.

Air Quality

Grade: D

The air quality in the Cleveland/Cuyahoga County area meets existing federal standards for criteria air pollutants, although just barely for ozone (the area currently meets the 1-hour ozone standard, but not the lower 8-hour standard). Emissions from automobiles and trucks are the biggest culprits; a few major industrial facilities also account for a large portion of the point-sources of ozone precursors. Furthermore, the agencies responsible for monitoring, permitting and enforcement have a number of problems and have been largely ineffective in controlling industrial sources in recent years. Finally, the county ranks among the worst 2-3% of U.S. counties for cancer and non-cancer risks due to hazardous air pollutants from automobiles and industrial sources.

The air that Cleveland residents breathe contains pollutants from local sources (cars, utilities, manufacturing, dry cleaners, etc.), but also from sources far away. Regardless of the source of pollution, a critical question that arises is—

➤ Is the air in my community clean?

Data limitations prevent us from being able to answer this directly. U.S. and state organizations monitor the air continually for six “criteria pollutants,” including carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter to determine if the air meets federal health standards (referred to as National Ambient Air Quality Standards, or NAAQS). According to the EPA, if the levels are consistently below the NAAQS, the air should be safe to breathe.¹ However, these pollutants are just six of the hundreds of potentially harmful air pollutants. In addition, because people are affected differently by the pollutants, some people may have problems, such as respiratory trouble, even when the criteria pollutant levels are below NAAQS.

Moreover, the concentration of pollutants can vary widely from one part of a city or county to the next, depending on emissions from individual facilities, highways and roads, and wind patterns. There are usually not enough monitors to account for all these variations—the city of Cleveland, for example, has one monitor for ozone; Cuyahoga County only has three.

Furthermore, there is little or no information on the interactive effects of pollutants. Available data describes the health effects of individual chemicals, such as ozone or benzene. The air contains a mixture of many of these chemicals, however, which, in combination, can cause more health problems than any of the chemicals alone.

Indoor Air

EPA studies have shown that indoor air levels of many pollutants can be 2 to 5 times – and sometimes more than 100 times – higher than outdoor levels. While data on the amount and sources of the problem is lacking, high indoor levels of air pollutants are thought to be related to—

- construction of more tightly sealed buildings,
- reduced ventilation to save money,
- use of synthetic building materials and furnishings, and
- use of chemically formulated personal care products, pesticides, and household cleaners.

(EPA Indoor Air Quality Home Page, <http://www.epa.gov/iaq/>)

¹ New NAAQS standards for ozone and particulate matter were issued in July 1997 and are being phased in. Many areas that meet current standards may not meet the new, stricter ones.

Using available monitoring data, we can answer the following questions:

1. What are the levels of criteria air pollutants? How have they changed over time?
2. Who is responsible for the air pollution?
3. How can air pollutants affect your health?
4. What is the local government doing about it?
5. Is it enough?

1. What are the levels of criteria air pollutants in Cleveland/Cuyahoga County? How have they changed over time?

Like the rest of the country, levels of most of the criteria pollutants in Cuyahoga County have declined in the last ten years. However, two pollutants are a special concern: ground-level ozone and particulate matter. Cuyahoga County ranks among the top of all Ohio counties for both of these pollutants.

Although ozone in the upper atmosphere is beneficial because it shields the earth from the sun's harmful ultraviolet radiation, high concentrations of O₃ at ground level (also known as smog) are a major health and environmental concern, contributing to asthma and other respiratory problems. Ozone is usually not directly emitted; rather, it is formed through complex chemical reactions of precursor compounds, such as volatile organic chemicals (VOCs) and nitrogen oxides (NO_x), in the presence of sunlight. These reactions are stimulated by ultraviolet radiation and temperature, so ozone levels typically peak during the warmer times of the day and year.

Of the three ozone monitors in Cuyahoga County, only one is located in the city of Cleveland (891 E. 152nd Street). The other two monitors are located outside of the city limits (6116 Wilson Mills Road in Mayfield and 390 Fair Street in Berea). All monitors are considered to be located in suburban areas.

Because pollutant levels can vary between different parts of the county and different types of development (i.e. urban vs. suburban vs. rural), the placement or number of monitors may not be enough to get an accurate reading of ozone levels in the Cleveland area. For example, Milwaukee County also has three ozone monitors, but they are located in rural, urban, and suburban areas. (Go to Scorecard, <http://www.scorecard.org>, for more information on the number of monitors and their recorded levels)

Particulate Matter

In addition to ozone, particulate matter (PM) is an increasing air quality concern. PM accumulates in the lungs and is associated with numerous respiratory illnesses, including asthma. Until recently, monitors only measured *coarse particles* (PM-10), essentially soot. Cuyahoga County has nine PM-10 monitors. Only one monitor recorded a violation of federal standards in 1998; the monitor is located at 2785 Broadway, an industrial area. However, in July 1997, U.S. EPA revised its standards and added new ones for *fine particles* (known as PM-2.5). EPA expected to designate non-attainment areas for PM-2.5 in 2003, however, legal wrangling has delayed data collection. The lack of data on the fine particles has prevented us from being able to include PM-2.5 in our analysis of Cleveland's air quality, although this is a public health concern for Cleveland area residents.

When are ozone levels measured and what are the NAAQS standards for ozone?

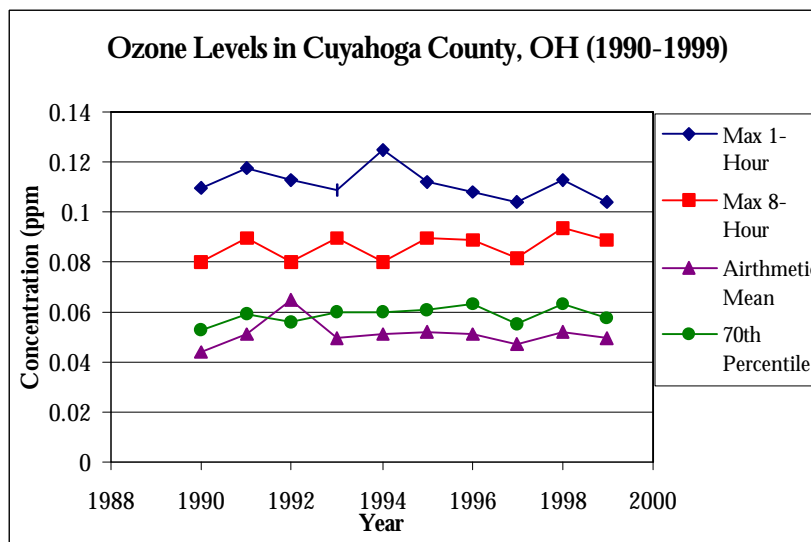
Ozone levels are taken continuously and then averaged over a one- or eight-hour interval. Historically, ozone levels were averaged over one-hour intervals to look at short-term (1 to 3 hours) exposures. According to this system, ozone levels are not to exceed the NAAQS of 0.12 parts per million more than once a year. If a county is in compliance with this standard for at least three consecutive years, the EPA begins taking only eight-hour measurements to evaluate long-term (6 to 8 hours) exposures; the NAAQS for long-term exposure is 0.08 ppm. By 2000, the 1-hour standard will be replaced with the stricter 8-hour standard.

Data from the monitors show that Cleveland and Cuyahoga County only exceeded the short-term ambient ozone levels (0.12 ppm) in 1994. At the same time, the county is always at or above the 8-hour maximum level (see the text box entitled “When are ozone levels measured and what are the NAAQS standards for ozone?” for an explanation of these measurements). The following chart compares the:

- maximum 1-hour ozone levels recorded in the county.
- maximum 8-hour ozone levels recorded in the county.
- arithmetic mean of the raw data from the 1-hour readings.
- seventieth percentile (i.e., 70 percent of the raw data were below this value).

A comparison of the seventieth percentile and the arithmetic means of the annual ozone values shows

Cuyahoga County’s “near misses” in exceeding the EPA’s 1-hour standard. A city with a large number of near-misses, and is therefore consistently hovering below noncompliance, poses more health risks to its inhabitants than does a city that is usually quite below the standard but occasionally records abnormally high ozone values. The figure shows that the mean exceeded the 70th percentile in 1992, indicating poor air quality that year. For the years after that, the mean has hovered below the seventieth percentile.



Note: To account for anomalies in readings and in specific days, we have followed EPA convention and used the second-highest (referred to as 2nd Max. 1-Hr) and the fourth-highest (4th Max. 8-Hr) readings for the analysis of 1-Hour and 8-Hour ozone values, respectively.

It is important to note this chart may not give an accurate reflection of ozone levels in Cuyahoga County, as three monitors may not be enough to show smaller local variations, or “hotspots” where pollutant levels are especially high. More locally based monitors could give people a better idea of the pollutant levels near their homes and help determine whether some parts of the city or county have better air quality than other parts. This information could help people determine

their actual exposure to ozone, as opposed to the county average, which can help them take action to work toward cleaner air.

Looking at the data from the monitors surrounding Cuyahoga County can help provide more information about ground level ozone in Cleveland. Because the reactions between the chemicals that form ozone can take approximately five to seven hours, ozone levels recorded from downwind monitors, such as those in Lake and Lorain Counties, can also reflect pollution levels in Cuyahoga County. These downwind monitors are ideally located 10 to 30 miles from the edge of an urban area; the monitors in Lake and Lorain Counties are located between approximately 20 and 30 miles from Cleveland. Lorain County has not recorded any exceedances since 1994, though, in 1999, its second highest 1-hour ozone level was only slightly below the NAAQS at .118 ppm. The monitors in Lake County exceeded the 1-hour NAAQS for ozone in 1997 and 1998, and have been hovering slightly below the NAAQS standard of 0.12 ppm since 1995. **These downwind readings indicate that pollutant levels are higher in Cleveland and Cuyahoga County than the monitors within Cuyahoga County may suggest.**

Nationwide, there has been a 19 percent decrease in one-hour ozone concentrations and a 16 percent decline in eight-hour concentrations between 1988 and 1997. Cuyahoga County's one-hour ozone levels declined 33 percent and its eight-hour levels decreased 8 percent during the same period. (Source: EPA National Air Quality and Emissions Trends Report, 1997, 33)

2. Who is responsible for the air pollution?

Air pollution sources are classified as either:

- *Mobile sources:* on-road vehicles, including cars and trucks, and off-road vehicles, such as airplanes and ships
- *Area sources:* small pollution sources that emit less than 10 tons per year of a criteria or hazardous air pollutant or less than 25 tons per year of a combination of pollutants.
- *Point sources:* typically large industrial facilities and utilities that emit at least 10 tons per year of any criteria or hazardous pollutant or 25 tons per year of a mixture of hazardous air pollutants

Sources of Ozone Precursors in Cuyahoga County, OH (1996)

Source of Emissions	NOx Emissions			VOC Emissions		
	Tons	% of Total	Pounds/Capita*	Tons	% of Total	Pounds/Capita*
Mobile	47,221	86%	67	40,937	52%	58
Area	2,362	4%	3	33,257	43%	47
Point	5,505	10%	8	3,818	5%	5
Total	55,088	100%	78	78,012	100%	110

^a Population of 1,399,272 is based on 1996 census estimates.

(Source: EDF Scorecard, <http://www.scorecard.org>)

Mobile sources are the biggest sources of ozone precursors in Cuyahoga County, many other urban communities in the Midwest, and elsewhere. Nationwide, mobile sources were responsible for almost 80% percent of carbon monoxide pollution and 50% of nitrogen oxide (NOx) emissions in 1996. In a typical urban area, at least half of the hydrocarbon and nitrogen oxide pollutants come from mobile sources, and in some urban areas, motor vehicles' contribution to carbon monoxide pollution can exceed 90 percent! In Cuyahoga County, for example, mobile sources accounted for 95% of CO, 86% of NOx, and 52% of VOC emissions in 1996.

Although normal passenger cars have generally become more fuel efficient in the past decade, this is not reflected by a decline in ozone levels in the figure "Ozone Levels in Cuyahoga County" on page 3. As in the rest of the country, the lack of decline in ozone levels can likely be attributed to the recent popularity of less efficient vehicles, such as Sport Utility Vehicles.

Area sources are stationary pollution sources, including dry cleaners, gas stations, and auto-body paint shops. Commercial buildings (heating and cooling units, surface coatings), residential buildings (fireplaces, surface coatings) and even the family lawnmower or barbecue grill fall into this category. Open burning, landfills, and wastewater treatment are considered area sources as well. Collectively, area sources are thought to be responsible for as much as 50 percent of particulate matter. Area sources tend to be concentrated in urban areas that are already stressed by air pollution from automobiles.

Point sources are major industrial facilities, including chemical plants, steel mills, oil refineries, power plants, iron and steel mills, and hazardous waste incinerators. Typically, electrical utilities and industrial boilers are the largest point sources of nitrogen oxide (NOx) emissions. In Cuyahoga County, just a few industrial facilities are responsible for a large portion of point-source releases of ozone precursors.

Primary VOC-emitting facilities in Cuyahoga County (1996)

Name	Industry Type (SIC)	Emissions (Lbs.)
Midwest Mica and Insulation Company	3999 – Manufacturing Industries	944,000
American National Can Company	2671 - Paper Coated & Laminated, Packaging	934,000
Ford Motor Co., Cleveland Casting Plant	3321 – Gray & Ductile Iron Foundries	532,000
Ashland Petroleum Company	5171 – Petroleum Bulk Stations & Terminals	474,000
Ritrama Duramark	2671 – Paper Coated & Laminated, Packaging	408,000

Primary NO_x-emitting facilities in Cuyahoga County (1996)

Name	Industry Type (SIC)	Emissions (Lbs.)
LTV Steel Company, Inc.	3312 – Blast Furnaces & Steel Mills	7,048,000
LTV Steel Company, Inc.	3312 – Blast Furnaces & Steel Mills	1,114,000
Cleveland Thermal Energy Corp.	4961 – Steam & Air-Conditioning Supply	838,000
Ford Motor Co., Cleveland Engine Plant 2	3711 – Motor Vehicle & Car Bodies	500,000
Medical Center Company	8082 – Home Healthcare Services	360,000
GMC-Chevrolet-Pontiac-Canada Group	3714 – Motor Vehicle Parts & Accessories	300,000

(Source: Scorecard, <http://www.scorecard.org>)

Facilities allegedly violating the Clean Air Act Regulations (1999)

According to the regional and U.S. EPAs, there are twelve facilities in Cuyahoga County that are allegedly violating Clean Air Act Regulations for emissions of air pollutants. They are:

Plant Name	Address	City	Zip
Cleaners Hangar Company	4704 Manufacturing Road	Cleveland	44135
Clestra Hauserman, Inc.	29525 Fountain Parkway	Solon	44139
Cleveland Clinic Foundation	8935 Carnegie Avenue	Cleveland	44106
Craft Masters, Div. of Evert Plating	16700 Westfield Avenue	Cleveland	44110
Hinkley Lighting	12600 Berea Road	Cleveland	44111
L. Gray Barrel and Drum Co.	2800 E. 90 th Street	Cleveland	44104
Lincoln Electric Company	22801 St. Clair Avenue	Cleveland	44117
Mantua Manufacturing Co.	7900 Northfield Road	Walton Hills	44146
PDI Ground Support Systems	5905 Grant Avenue	Cuyahoga Heights	44105
Reilly Industries, Inc.	3201 Independence Road	Cleveland	44105
Research Oil	2655 Transport Road	Cleveland	44109
Sherwin Williams	530 North Second Street	Bedford Heights	44146

(Source: EPA Region 5, <http://www.epa.gov/ARD-R5/enforce/enforce1.htm>)

Enforcement actions are determined on a case-by-case basis and can range from warnings, legal orders and lawsuits to fines, imprisonment, and sanctions.

3. How can air pollutants affect your health?

As noted above, much of the research on air pollution has focused on the six criteria pollutants, which are known to have many adverse health effects. These health effects include decreased lung function, and heart and lung diseases. Even short-term exposure to ozone has been found to reduce lung function and induce respiratory inflammation in normal, healthy people during exercise. Long-term exposure to high ozone levels can damage lung tissue, reduce lung function, and sensitize the lungs to other irritants. High levels of criteria pollutants also cause acid rain and can significantly harm ecosystems and the environment. Monitoring by the U.S. EPA and state agencies shows that over 100 million people lived in counties where one or more criteria pollutants were above the NAAQS in 1997.

In addition to the health effects posed by criteria air pollutants, the U.S. EPA has determined that for every 1 million people in Cuyahoga County, there are about 370 cases of cancer that can be attributed to air pollutants known as Hazardous Air Pollutants (HAPs). This rate is 370 times the Clean Air Act's goal of one in 1 million people, placing the county among the worst 2% of U.S. counties. Nationwide, the U.S. EPA estimates that mobile sources account for as much as half of all cancers caused by HAPs.

For non-cancer health risks, including asthma and reproductive problems, the EPA calculates a chemical hazard index based on the ratio of an area's HAP concentrations to the safe exposure levels for the pollutant. In Cuyahoga County, the average individual's non-cancer cumulative health index, the sum of all non-cancer health indexes, is 19 – nineteen times the Clean Air Act's goal and the 70th highest figure out of 3,111 U.S. counties for which data is available.

(Source: Scorecard, <http://www.scorecard.org>)

What are Hazardous Air Pollutants?

In 1990, the U.S. Congress designated 189 hazardous air pollutants (HAPs) because they are known or suspected to cause serious health problems. They include chemicals associated with cancer; neurological, respiratory, reproductive, and developmental problems; and other adverse effects on human health. The National Toxics Inventory estimates that 8.1 million tons of HAPs are released into the air each year with about 61 percent coming from point sources (mostly power plants and refineries), 18 percent from area sources and 21 percent from mobile sources,.

Six HAPs in particular are a problem, accounting for more than 90 percent of the cancer risk due to outdoor HAPs.

1. 1,3 butadiene: mostly from mobile sources.
2. Polycyclic organic matter: 51 percent come from mobile sources, 24 percent from area sources, and 25 percent from point sources.
3. Benzene: primarily from automobiles in their exhaust or fuel combustion.
4. Carbon tetrachloride: primarily from chemical and allied manufacturers and oil refineries. It has a long atmospheric lifetime.
5. Chromium: mostly from point sources such as steel and cement producers.
6. Formaldehyde: primarily from mobile sources.

4. What is the local government doing about it?

The Ohio Environmental Protection Agency and the U.S. EPA are responsible for inspecting facilities to ensure that they meet federal standards for criteria and hazardous air pollutants. Two other agencies, namely the City of Cleveland Department of Health's Division of Air Pollution Control and the Northeast Ohio Areawide Coordinating Agency work on air pollution issues in the Cleveland/Cuyahoga County area.

The Department of Health's Division of Air Pollution Control is assigned with ensuring that air emissions from industrial sources are in compliance with federal, state, and local regulations.² The Division of Air Pollution Control has been plagued by a number of problems in the past decade. First, the Ohio EPA found in 1996 that the Division of Air Pollution Control drafted erroneous permits, had a low volume of enforcement actions against major violators, and did not

² City of Cleveland Department of Health Division of Air Pollution Control (<http://community.cleveland.com/cc/clevelandhealth>)

take actions to document or ensure compliance with permits. In addition, the federal Justice Department has filed a lawsuit against the City of Cleveland and the Division of Air Pollution Control alleging mispending of \$423,942 of the \$2.4 million allocated for local air pollution control between 1994 and 1998. Furthermore, the U.S. EPA is concerned that there is no emissions data for Cleveland for the years 1991 to 1997. Another worry is that the Division of Air Pollution Control failed to provide basic information and respond to people's complaints and concerns, resulting in distrust and dissatisfaction of area residents. One problem cited is that inspectors don't always follow up on complaints, and when they do, their inspection process sometimes consists of only a "drive by with the windows down."³

The Cuyahoga Clean Air Council, a committee comprised of area residents, community groups, and environmental and health organizations, was created to address these, and other, problems. Some changes that the Division of Air Pollution Control have made based on the Council's recommendations include:

- 24-hour inspector availability,
- a new complaint tracking system to ensure that all complaints are followed-up and investigated within a week,
- regular meetings with the City Law Department to improve the staff's ability to collect evidence and give effective testimony,
- prescreening Title V facility files so citizens can use their time more effectively during the 30 day public comment period,
- participating in citizen workshops with the Clean Air Conservancy to inform citizens on ways to participate in the air pollution process.

Several of the most crucial reforms have not been implemented yet, and it is unsure when they will be implemented. Some of these reforms are:

- forming an advisory board to improve citizen and community involvement,
- hiring an ombudsperson to handle information requests, citizens' questions, public outreach, and education,
- creating a Division of Air Pollution Control webpage that will provide updated information on Cuyahoga County's air quality,
- implementing more educational and information dispersal activities,
- utilizing GIS mapping to identify and target pollution "hot spots."

The Northeast Ohio Areawide Coordinating Agency (NOACA) is charged with transportation and environmental (air and water quality) planning in Northeastern Ohio, namely Cuyahoga, Geauga, Lake, Lorain and Medina Counties. The 1990 Clean Air Act Amendments designated the Northeastern Ohio region a "moderate non-attainment" area for ozone, and Cuyahoga County a non-attainment area for carbon monoxide and PM. As a result, NOACA developed a State Implementation Plan with the Ohio EPA to reduce regional ozone by 15% by 1996. Some of the plans implemented include enhanced tailpipe emissions tests, region-wide use of reformulated gasoline (which reduce ozone creation), a voluntary citizen action program aimed at reducing ozone emissions, and encouraging measures aimed at reducing vehicles on roadways

³ Cuyahoga Clean Air Council, "Air Quality Protection: A Citizen Right and Responsibility," October 1999.

through carpooling, flextime, and bicycle commuting. There is also an Ozone Action Day Program and an Air Quality Online web site (<http://www.neoair.noaca.ohiou.edu>), which notifies the general public of the current air quality. In addition, NOACA conducts air quality conformity analyses biennially to ascertain whether additions to the road network would decrease air quality.

The region was declared to be in attainment for ozone in 1996, and it is currently in an ozone maintenance plan. Many of the improvements in air pollutant levels were due to the closure of coke ovens and certain industries, such as LTV Steel. The region is just below non-compliance for the 1-hour levels, however, and is not in compliance with the stricter 8-hour levels. The U.S. EPA predicts that the area will be in attainment for the 8-hour levels after the implementation of NOx emissions controls (NOx SIP call) in utilities and other large point sources. The NOx SIP call requires 22 states (including Ohio) and Washington, DC to implement a NOx reduction plan to reduce ozone transport across state boundaries. These do not solve the increasing levels of air pollution from our driving behavior, however. Unless measures are taken to decrease driving and increase fuel efficiency, the declines in air pollution from controls on point sources are likely to only be temporary.

Furthermore, the 15-county (which includes Cuyahoga County) northeast Ohio region received a U.S. EPA EMPACT grant in 1998 for its Northeast Ohio Community Accessible Air Quality Monitoring Assessment System. The plan is to have air quality information available in near real-time, to develop an urban growth monitoring tool, and to implement a community outreach program through interviews, meetings, and focus groups. The goal is to use the models to help community members make informed decisions on how they can reduce the negative health impacts, bad air quality, and environmental degradation that often accompanies urban growth.

5. Is it enough?

Improve data collection

Counties, such as Cuyahoga County, that have few ozone monitors may not be getting an accurate impression of ozone levels in the area as levels can vary widely from one place to the next within the county. Some communities have increased monitoring in their community themselves by doing their own monitoring, influencing the number of monitors, and their placement. For example, the Bucket Brigade, a collaboration of Communities for a Better Environment and the Regional Accident Prevention Coalition in California, put air monitoring in citizens' hands. They developed a bucket air sampling device for community members and collected and analyzed data on the concentrations of VOCs and gaseous sulfur compounds in the ambient air.

Reform the Cleveland Department of Health's Division of Air Pollution Control as recommended by the Cuyahoga Clean Air Council

As previously noted, Division of Air Pollution Control's efforts to regulate industrial sources of air pollution have been inadequate and many of the reforms recommended by the Cuyahoga

Clean Air Council have yet to be implemented. Key reforms that would help to build public confidence in the Division and that could be implemented immediately are:

- hiring an ombudsperson that deals with information requests, questions, outreach and education,
- increasing the education and information dispersal activities,
- improving citizen and community involvement through the formation of an advisory board,
- identifying and targeting pollution “hot spots” through technologies such as GIS mapping,
- creating a webpage that with updated information on that day’s air quality.

Reduce vehicle emissions

The biggest sources of urban air quality problems are cars and trucks. Despite the modest population growth of many urban areas, individuals are using their cars more and the overall fleet has become less efficient due to the recent popularity of SUVs. Until emissions from cars and trucks are lowered, efforts to improve urban air quality will have only limited success.

Besides reducing emissions, using alternative fuels, such as compressed natural gas, or electric-powered vehicles, can reduce the impact of transportation on air quality. Some areas require that a minimum percentage of city-owned vehicles use alternative fuels. For example, a number of cities are using natural-gas buses. Incentive programs, such as Pennsylvania’s Alternative Fuels Incentive Grant, can encourage the development and use of alternative-fuel vehicles. The program helps fund individuals and organizations to purchase, convert, and develop alternative fuel vehicles and to purchase and install refueling and recharging facilities for these vehicles.

Pollution Prevention Initiatives (point and area sources)

In addition to the pollution from vehicle tailpipes, Cuyahoga County air quality is also impacted by vehicle manufacturing. The charts on page 5 and 6 show that three of the top 11 facilities that emit ozone-producing chemicals (VOCs and NO_x) are motor-vehicles factories. Several others, including LTV Steel supply materials for the auto industry. This is fairly consistent with other parts of the country. The following table shows that just a few industry sectors are responsible for a large portion of the VOCs releases in the United States.

Industry Sector	Nationwide VOC Releases (tons/year)
Petroleum Refining	369,058
Organic Chemicals	201,888
Rubber and Misc. Plastics	140,741
Fabricated Metals	102,186
Printing	101,537
Motor Vehicles, Bodies, Parts, Accessories	101,275
Pulp and Paper	96,875
Iron and Steel	82,292
Dry Cleaning	7,310

(Source: U.S. Environmental Protection Agency, *Profile of the Petroleum Refining Industry* (Washington, DC: US EPA, 1995), 19)

The only effective long-term solution to air pollution is to prevent VOC- and hazardous air pollution from being created in the first place. Many technologies and approaches exist to reduce pollution in various industries, which Environmental Defense has compiled and made available on the Internet (<http://www.environmentaldefense.org/programs/PPA>). The Industry Sector Guides provides information specific to the petroleum refining, iron and steel, and auto assembly industries as well as other useful information on how businesses can prevent pollution.

State and federal agencies and environmental and business groups have explored various nonregulatory or “green business” strategies to reduce area source generated pollution with varying amounts of success. A few of the large-scale efforts include:

- **Climate Wise:** Under this voluntary program, companies draw up a comprehensive plan of cost-effective emissions reduction and prevention measures. In return, the U.S. EPA and the U.S. Department of Energy provide technical and financial assistance. (Climate Wise website: <http://www.epa.gov/oppeinet/oppe/climwise/cwweb/index.html>)
- **Green Star:** This program demonstrates that pollution prevention and energy efficiency can save money and attract customers. Enrolled businesses receive information, recommendations, and other assistance in implementing Green Star standards. (For more information, refer to <http://www.epa.gov/opptintr/p2home/ppis/ppispam.htm>)
- **Great Printers:** This is a collaborative effort among environmental groups, state environmental agencies, and lithographic printers in the Great Lakes region. To learn more about it, visit the website for the Printers National Environmental Assistance Center at <http://www.pneac.org/prog.html> or Environmental Defense's home page at <http://www.environmentaldefense.org>.
- **Dry Cleaners:** Several programs encourage alternatives to traditional dry cleaning which uses the toxic chemical perchloroethylene. Greenpeace and the Center for Neighborhood Technology have compiled a list of all wetcleaning businesses (<http://www.greenpeaceusa.org/media/factsheets/wetcleanlist.htm>). The Ohio EPA also has a program aimed at preventing pollution at dry-cleaning facilities (<http://www.epa.ohio.gov/dhwm/drymain.htm>)

Chattanooga, Tennessee

In 1969, Chattanooga, TN was named the most polluted city on the nation by the U.S. Department of Health, Education, and Welfare. Incredibly, only three years later, the city was considered to have some of the lowest air pollution levels in the country, largely to close cooperation between citizens, government, and industry leaders. The city's industrial economy and topography – where warm air traps cold air and pollution in the valleys of the city – led to high concentrations of particulate matter, largely from flyash, smoke and dust. The 1969 report, in addition to increasing claims of pollution-related sickness and deteriorating scenic views, led the city to take action to curb this problem.

In late 1969, the city passed the Air Pollution Control Ordinance, which set limits on visible emissions from industry, on open burning, and on emissions of odors and dust. In addition, visible automotive emissions were banned and the sulfur content of fuel was capped at four percent. At the same time, the city formed the Air Pollution Control Board and Bureau, which is comprised of unpaid citizens, health experts, and government leaders. By October 1972, all the major pollution sources had met the Ordinance's goal.

Since then, the Bureau has focused on further reducing particulate matter and other chemical emissions, especially from smaller area sources. In addition, the city has the largest fleet of electric buses in the U.S. Finally, the Bureau also has an extensive outreach program to educate the public as well as explain new regulations to businesses before inadvertent violations occur. As a result, Chattanooga is consistently below EPA's one-hour ozone standard.

(Sources: Chattanooga-Hamilton County Air Pollution Control Bureau, [A History of Air Pollution Control in Chattanooga and Hamilton County](#), 1999. Chattanooga-Hamilton County Air Pollution Control Bureau, [Progress Report 1998](#))

Links for more information

- **Environmental Defense's Pollution Prevention Alliance (PPA)**

<http://www.environmentaldefense.org/programs/ppa/>

This site contains the reports released by PPA, including the *Industry Sector Community Guides*, and *A Guide to Cleaner Vehicle Design, Use and Disposal*, the Environmental Sustainability Kit, and the Sustainable Cleveland Health Action Guide.

- **Clean Air Conservancy**

<http://www.cleanairconservancy.org>

Founded in 1992, this Ohio-based organization aims to prevent air pollution through systematic changes in the economy, especially polluting organizations, and increased public education. The Clean Air Conservancy acquired marketable pollution allowances and retires them, preventing chemicals such as sulfur dioxide from entering the environment.

- **Scorecard**

<http://www.scorecard.org>

This interactive guide allows you to enter your zip code and receive information on what pollutants are being released into your community and who is responsible for them. It also gives an overview of the different air pollutants and their relative toxicity and currently contains information on five different issues: hazardous air pollutants, criteria air pollutants, chemical releases from manufacturing facilities, animal waste from factory farms, and setting environmental priorities.

- **Earth Day Coalition**

<http://www.earthdaycoalition.org>

The Earth Day Coalition was created in 1990, for the twentieth anniversary of the first Earth Day. Together with PPA, EDC works on community pollution prevention through the Sustainable Cleveland Partnership. In addition, the group works on promoting community environmental involvement of high school students, the Clean Cities program, an EPA EMPACT project, and EARTHfest, an annual month-long celebration of Earth Day.

- **Northeast Ohio Areawide Coordinating Agency**

<http://www.noaca.org>

NOACA is a regional organization of local officials responsible for carrying out transportation and environmental planning under local direction and in accordance with federal and state mandates. The NOACA area includes Cuyahoga, Geauga, Lake, Lorain, and Medina Counties. On air quality, NOACA coordinates the Ozone Action Day program, maintains the Northeast Ohio Air Quality Online Web Site, and assesses the impacts of transportation development decisions.

- **Natural Resources Defense Council (NRDC) *Breath-Taking* Report**

<http://www.nrdc.org/nrdcpro/bt/state/WI.html>

This is a web-version of NRDC's Breath-Taking report, which estimates for 239 American cities the rates of premature death rates caused by particulate air pollution.

- **U.S. EPA Office of Air Quality Planning and Standards**

<http://www.epa.gov/airsweb/>

Containing billions of pollution values and related data, the interactive AIRS database is the world's most extensive collection of air pollution data, providing information on point sources of pollution, readings from specific monitors, and maps for anywhere in the U.S.

- **U.S. EPA Office of Air and Radiation, Unified Air Toxics**

<http://www.epa.gov/ttn/uatw/>

This comprehensive site gives information on HAPs and the existing rules on their release. In addition, it offers contacts and links, as well as state, local, and tribal reports and publications.

- **U.S. EPA Office of Air and Radiation, Publications:**

- *Risk Assessments for Toxic Air Pollutants: A Citizen's Guide*

http://www.epa.gov/ttn/uatw/3_90_024.html

An introduction to toxic air pollutants and risk assessments that discusses how the hazards can be identified and exposure assessed, and how the dose-response can be determined. It also examines risk, both cancer and noncancer risks, and the uncertainties of the risk assessment.

- *Evaluating Exposures to Toxic Air Pollutants: A Citizen's Guide*

http://www.epa.gov/ttn/uatw/3_90_023.html

An easy, step-by-step guide to help people determine the amount of exposure they face from toxic air pollutants.

- **U.S. EPA Office of Air Quality Planning and Standards, *Taking Toxics Out of the Air***

http://www.epa.gov/airprog/oar/oaqps/takingtoxics/index_small.html

This comprehensive report discusses the progress in achieving the maximum achievable control technology (MACT) standards under the Clean Air Act. In addition, it offers information on HAPs and their environmental and health effects.

- **U.S. EPA Office of Mobile Sources**

<http://earth1.epa.gov:80/OMSWWW/omshome.htm>

This EPA site focuses on mobile sources of air pollution. It also offers information on global warming, air toxics, and fuel consumption.

- **U.S. EPA Center for Environmental Innovation and Statistics (CEIS)**

<http://www.epa.gov/ceis/>

CEIS offers national, state, and local information on selected environmental topics, as well as census data.

- **U.S. EPA Office of Enforcement and Compliance, Assurance Sector Notebooks**

<http://es.epa.gov/oeca/sector/index.html>

These notebooks describe twenty-eight industrial sectors, from petroleum refining to the organic chemicals industry to shipbuilding. Each report includes information pollution prevention and applicable regulations.

- **Ohio EPA Division of Air Pollution Control**

<http://www.epa.ohio.gov/dapc/dapcmain.html>

This site offers local information and data on air pollution issues in Ohio.

- **U.S. EPA Air and Radiation Division, Region 5**

<http://www.epa.gov/ARD-R5/>

This site offers basic information on NO_x emissions as well as reports on toxics and other issues.

- **Ohio EPA Environmental Guide for Ohio Dry Cleaners**

<http://www.epa.ohio.gov/dhwm/drymain.htm>

This factsheet gives basic information about the dry cleaning process and the accompanying environmental hazards. It also explains the applicable regulations and suggests solutions and contacts.