

Air Quality

Principles

Georgians have the opportunity to enjoy an excellent quality of life in which both the economy and the environment, including air quality, thrive. Time and again, it has been shown that the ability to adopt environmental protections depends on the ability of people to adopt the kind of institutions that create wealth and technological advancements. Transparent government, science-based decisions instead of legislation by litigation, flexibility in solving challenges and respect for property rights help foster a wealthy society that can then devote resources to enhancing the environment. Market-oriented solutions instead of top-down mandates allow industry and business to make cost-effective solutions that translate into less cost to consumers, allowing them to afford better health and living choices. Requirements for air quality improvements should focus more on outcomes and less on process. Most important, there is a point of diminishing returns where the cost of air quality standards exceeds the benefits. This is the stage at which it harms the economy and the individual, but that is irrelevant to the promulgator of air quality rules: The U.S. Environmental Protection Agency is only required to consider the public health benefit, not the cost, of its rules.

Agenda

- **Implement an effective emissions trading system similar to the Ozone Transport Commission (OTC) in the Northeast and Mid-Atlantic, which implements a regional cap-and-trade strategy to reduce ground-level ozone.**
- **Prioritize air pollution risks.**
- **Reduce traffic congestion.**
- **Use remote sensing technology to target the small number of high-polluting vehicles.**
- **Use market incentives to encourage fleet turnover.**
- **Lower the fixed costs of owning an automobile.**
- **Embrace innovative incentives to encourage use of transportation alternatives.**
- **Encourage market-oriented policies to increase urban tree cover and reduce impervious surface and stormwater runoff.**
- **Encourage more telecommuting.**

Facts

The overall quality of Georgia's air is good – and getting better. However, federal air quality standards are getting tougher, which will keep Georgia in non-attainment for concentrations of some pollutants, namely, ozone and particulate matter.

Ozone season in metro Atlanta is March 1 – October 31. Ozone forecasting season is May 1 – September 30.

The U.S. Environmental Protection Agency has strengthened the air quality standards for ground-level ozone, a primary component of smog. In 1997, EPA toughened the ozone standard for areas outside the 13-county metro Atlanta non-attainment area from a 1-hour ozone standard to an 8-hour average ozone standard. In March 2008, EPA revised the 8-hour average ozone standard to lower the thresholds for ozone levels reported as 'Unhealthy.' The air quality standard for ozone, which had been 0.08 parts per million (ppm), averaged over eight hours, was reduced to 0.075 ppm, averaged over eight hours.

Between 1970 and 2007, U.S. gross domestic product increased 207 percent, vehicle miles traveled increased 179 percent, energy consumption increased 49 percent, and the U.S. population increased 47 percent. At the same time, total emissions of the six principal air pollutants decreased 57 percent.¹

¹ U.S. Environmental Protection Agency Air Trends, <http://www.epa.gov/airtrends/sixpoll.html>

Research on vehicles in metro Atlanta indicates 3 percent of the vehicles on the road produce approximately one quarter of all mobile source pollution. Likewise, 10 percent of all vehicles produce approximately half of all mobile source pollution.

Emissions measures – daily vehicle emissions of volatile organic compounds, nitrogen oxides and primary fine particulate matter – show that metro Atlanta vehicle emissions in 2007 were 67, 67 and 71 percent of their respective 2000 levels, a drop of about a third over six years.²

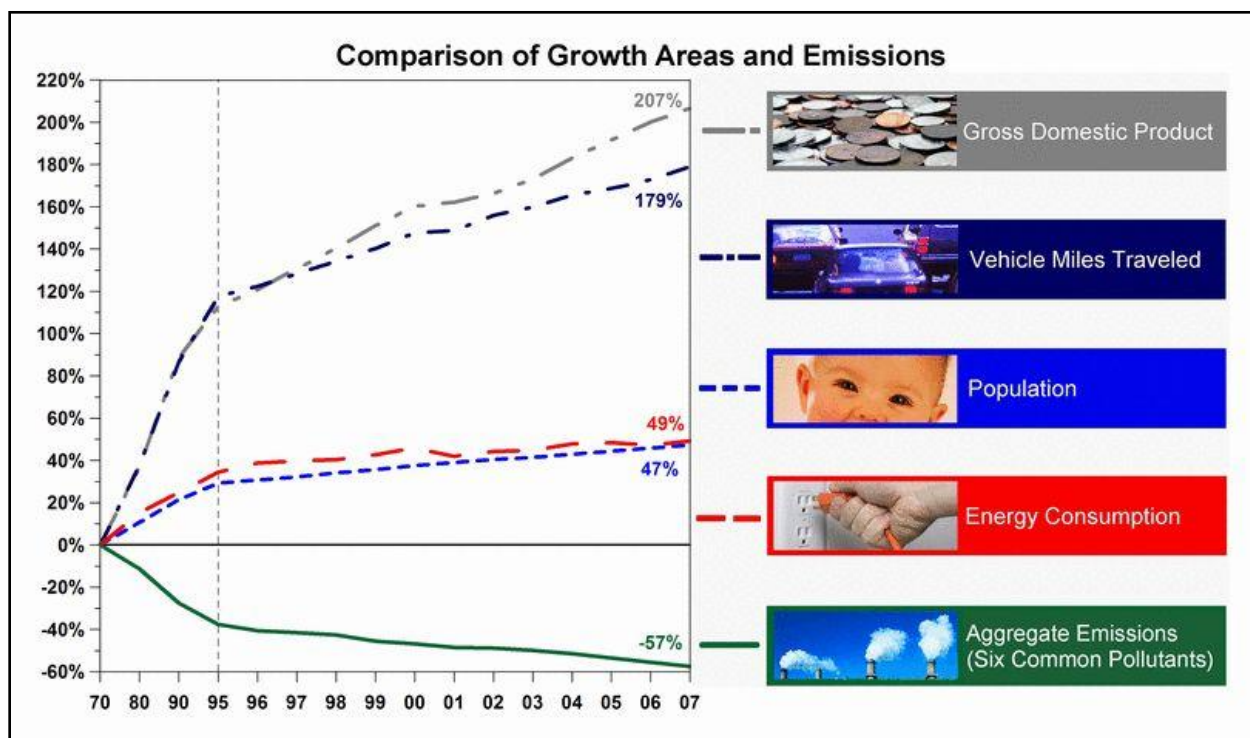


Figure 1: 2007 National Air Quality Trends (Source: U.S. Environmental Protection Agency)

Although the 13-county metro Atlanta area is in nonattainment for ozone, it meets current standards the vast majority of the time. In 2007, just 29 exceedances of the tougher eight-hour standard were reported in metro Atlanta; just three out of 11 metro Atlanta monitors exceeded the one-hour standard on one day.³

Meeting federal air quality standards is not just a challenge for the metro Atlanta area. In 2007, monitors reported nonattainment of ozone standards in Macon, Augusta, Columbus, as well as the Cohutta Wilderness Area of North Georgia.⁴ Additional regions of the state will face difficulty in attaining tougher ozone and particulate matter standards.

² 2007 Transportation Metro Atlanta Performance (MAP) report http://www.grta.org/PDF_Files/2008_Transportation_MAP_Report.pdf

³ Georgia Environmental Protection Division

⁴ Exceedances of Federal Air Quality Standards in Georgia, 2007, <http://www.air.dnr.state.ga.us/tmp/exceedances/index.php?yr=2007>

Georgia Region	Ozone 8-hr avg (O ₃ ppm)	Particulate Matter Fine (PM _{2.5} µg/m ³)
Athens	2	7
Atlanta	29	24
Augusta	3	9
Columbus	2	10 ⁵
Macon	5	12
North Georgia	4	0
Savannah	0	7
S. Central Georgia	0	0
S. Coastal Georgia	0	0

Figure 2: 2007 24-hour exceedances of federal air quality standards. (Source: Georgia EPD)

Technological advances have greatly contributed to positive air quality trends. Engineering developments such as the three-way catalytic converter and computer-controlled electronic fuel injection have reduced automotive emissions today to less than 5 percent of what they were 40 years ago.⁶ And by 2009, all new passenger vehicles will conform to standards that allow for less than 1 percent of the tailpipe emissions that were allowed in the 1960s.⁷

In addition to the respiratory problems that excessive ground-level ozone can pose to humans, it can also impact plants. Southern commercial loblolly pine was estimated to show 2-5 percent annual growth reduction at current levels of ozone, according to the Southern Oxidant Study, and that could result in a 10 percent reduction in stemwood biomass over a 10-year period. However, the elevated levels of carbon dioxide evident in climate change (often referred to as “global warming”) far offset the negative effects of increasing ozone on the loblolly, according to researchers.⁸

Trends

Georgia has adopted national standards for six primary air pollutants: carbon monoxide, lead, nitrogen dioxide, particulate matter, sulfur dioxide and ozone. A network of sampling monitors throughout the state monitors the levels of these pollutants. Georgia meets federal standards for all except ozone and particulate matter in certain areas of the state.

Despite soaring population growth in the state, emissions monitors show Georgia’s air is getting cleaner. Even so, the metro Atlanta area has been reclassified from “serious” nonattainment to “severe” nonattainment. The air is not worse; the federal government has raised the bar and standards have gotten tougher. Concentrations of particulate matter have also declined since monitoring began in 1999. In 2006, VOCs and NOx were at 67 percent of 2000 levels and fine particulate matter (PM 2.5) had declined to 71 percent of 2000 levels. This decline took place in spite of the increase in total vehicle miles traveled in the region.

⁶ Understanding Low-Emission Vehicles, J.D. Power, <http://www.jdpower.com/autos/articles/Understanding-Low-Emission-Vehicles>

⁷ Ibid.

⁸ “Studies reveal some trees ‘pine’ for greenhouse gases,” Research Page, Warnell School of Forest Resources, University of Georgia, www.forestry.uga.edu/warnell/research/html/forestry/pine.html

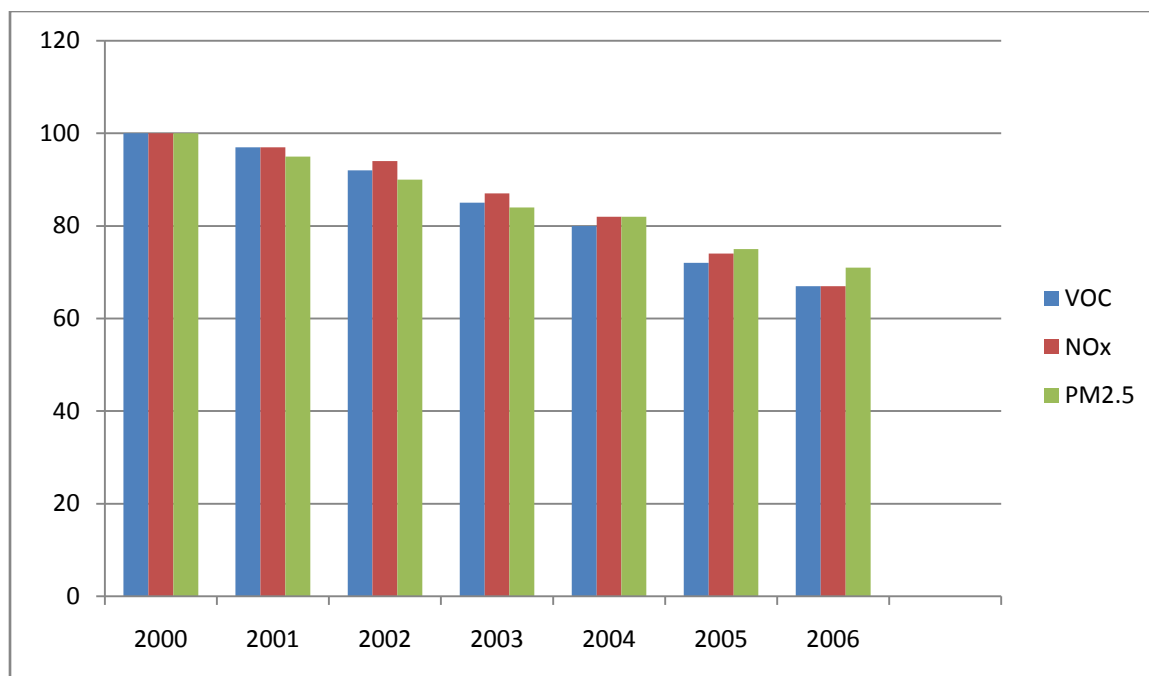


Figure 3: VOC, NOx and PM2.5 Vehicle Emissions in the Atlanta area relative to 2000 (Source 2008 Transportation MAP)

Overview

What Is Ground-Level Ozone?

Ozone occurs naturally in the stratosphere approximately 10-30 miles above the earth's surface and forms a layer that protects life on earth from the sun's harmful rays. However, high levels of ozone in earth's lower atmosphere – ground-level ozone – can be harmful to human health.

The recipe for ozone is simple: Nitrogen oxides (NOx) and volatile organic compounds (VOCs) combine in sunny, stagnant heat. In Georgia, 76 percent of VOCs are biogenic, or produced by nature. They combine with NOx, largely from automobiles and industry, to form ozone. Add particulate matter to the mix and it produces a smoggy day in Georgia. Because heat and sunlight play pivotal roles in the formation of ozone, May through September is designated as "ozone season." NOx emissions have become the primary target of the ozone-reduction equation in metro Atlanta for a number of reasons.⁹

⁹ VOCs differ widely in their ozone-forming potential, with the strongest classes of VOCs being of natural origin: Nearly 40 percent of VOC emissions, including the most strongly ozone-producing VOCs in the area, actually come from trees. Such natural sources of VOCs are actually stronger in promoting ozone formation than man-made sources are. In fact, one study of natural VOC emission strength took advantage of a natural experiment to demonstrate how little impact man-made VOC controls can have: While man-made VOC emissions in metro Atlanta decreased 37 percent from 1979 to 1985, there was no noticeable decline in ozone levels. In fact, ozone levels may have even increased. Another reason to focus on NOx reduction is that reductions of man-made VOCs occur as a by-product of processes used to reduce man-made NOx emissions; however, little NOx reduction occurs as a by-product of the processes used to reduce man-made VOC emissions. Source: Innovative Approaches for Meeting the Georgia Ozone Challenge, Georgia Public Policy Foundation, 1999.

What are the sources of ozone-forming emissions?

Sources of ozone-causing emissions are divided into five categories. Biogenic sources are natural sources such as plants and trees. A point source is any stationary location or fixed facility from which pollutants are discharged, such as a factory smokestack. An area source is any source of air pollution that is released over a relatively small area but cannot be classified as a point source, such as small engines, small businesses and household activities. An on-road mobile source is any non-stationary source of air pollution such as cars, trucks, motorcycles, buses, airplanes and locomotives. Off-road mobile sources include combustion engines on farm and construction equipment, gasoline-powered lawn and garden equipment, and power boats and outboard motors.

The largest source of VOC emissions in metro Atlanta is from on-road mobile sources and natural (biogenic) sources. More than 90 percent of the VOC emissions entering the earth's atmosphere are from vegetation, primarily foliage.

The largest contributors to nitrogen oxides emissions are point sources. Fossil-fuel combustion for electricity generation contributes approximately 24 percent of U.S. manmade NOx emissions. Nitrogen oxides are also produced during lightning strikes, in well-fertilized cropland and pastures, and by motor vehicles and other combustion sources. Accumulation of ozone also is affected by the weather – hot summers produce more exceedances of the ozone standard.

How serious is the problem?

***"The quantity of hydrocarbons emitted by the abundant trees in this region is sufficient that Atlanta could theoretically violate ambient ozone standards even if humans reduced their hydrocarbon emissions to zero."*¹⁰ – [2006 Georgia Ambient Air Surveillance Report](#)**

As with many issues, opinions differ regarding the seriousness of the ozone levels. The Atlanta ozone nonattainment area was officially expanded in 2004. After the EPA issued its tougher 8-hour ozone standard, the Georgia EPD recommended the following counties be designated in nonattainment: Barrow, Bartow, Bibb, Carroll, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Hall, Henry, Newton, Paulding, Richmond, Rockdale, Spalding and Walton. The EPA responded by adding Catoosa and Walker counties in North Georgia and Houston and Monroe in the Macon area.

As demonstrated by the accompanying charts, for most air pollutants, Georgia is well below federal standards and the trend is getting better. This does not mean that Georgia should not continue efforts to improve air quality, but there needs to be acknowledgment of the progress that has been made and an admission that perfect air quality is impossible and costly.

¹⁰ 2006 Georgia Annual Air Quality Report, <http://www.air.dnr.state.ga.us/amp/report06.pdf>

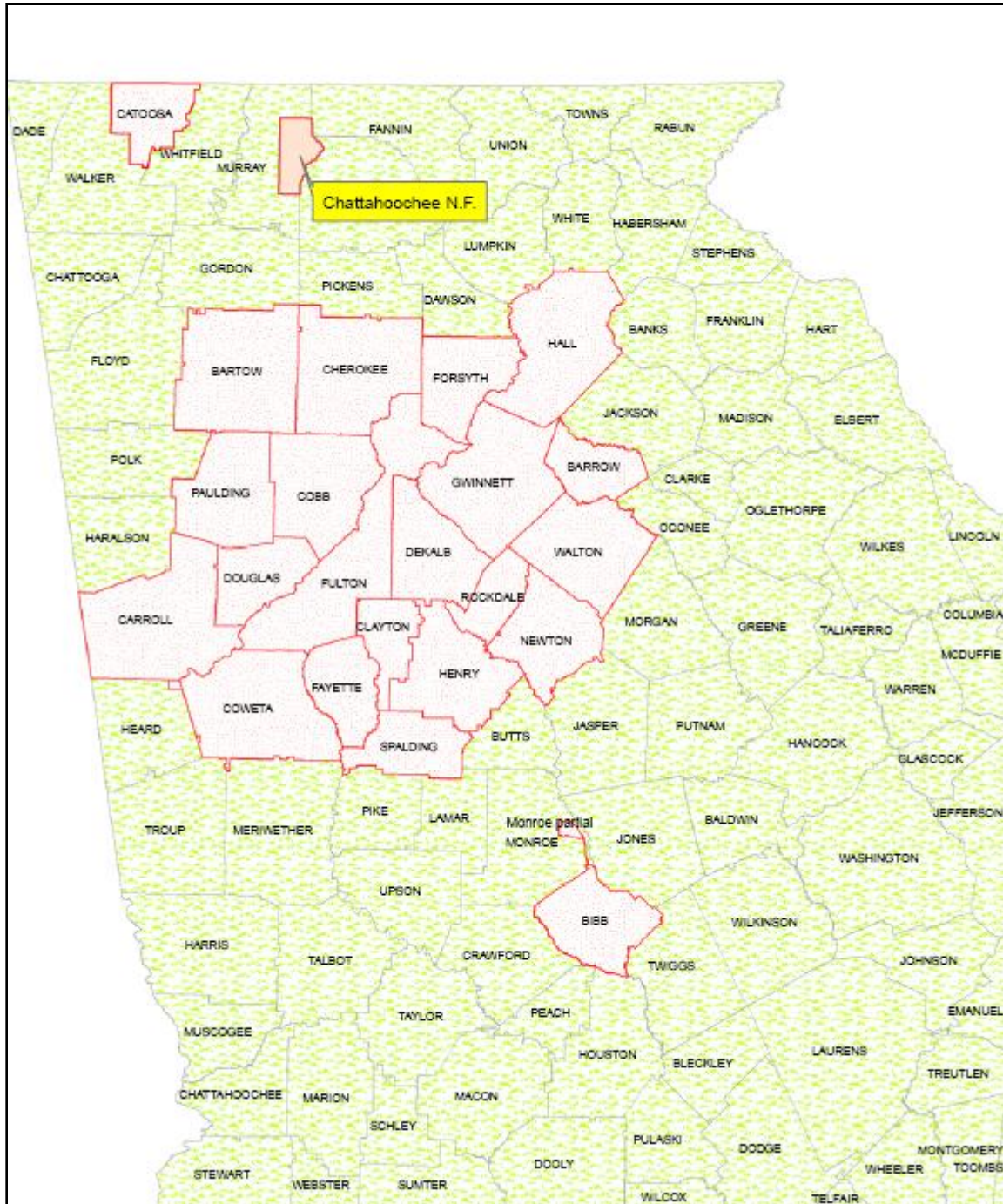


Figure 4: Ozone nonattainment areas in Georgia (Source: Georgia Environmental Protection Division)

The science of ozone creation

The chemical processes that form ozone in the atmosphere are nonlinear, which means that any change in emissions will not be accompanied by a proportional change in amount of ozone formed.¹¹ Therefore, it

¹¹ Source: Southern Oxidant Study http://www.ncsu.edu/sos/pubs/sos3/State_of_SOS_3.pdf

is difficult to estimate the impact that certain emission reductions will have on ozone concentrations. Sometimes the effect is contrary to conventional wisdom. For example, it has been observed that less ozone is created in high NO_x concentrations. Therefore, for large sources of NO_x such as power plants, the benefits of decreasing emissions of NO_x can be partially offset by an increase in the efficiency with which ozone is formed.¹²

What is particulate matter?

Particulate matter is tiny particles invisible to the naked eye but collectively seen as haze, soot or dust clouds. Produced by a variety of sources, its composition varies widely.

Those particles that are less than 2.5 micrometers, or microns, in diameter are known as “fine” particles; those larger than 2.5 microns are known as “coarse” particles. (A human hair is 70-100 microns in diameter.) Fine particles result from fuel combustion, including from motor vehicles, power generation, industrial facilities, residential fireplaces and wood stoves. Fine particles can be formed in the atmosphere from gases such as sulfur dioxide, nitrogen oxides and volatile organic compounds. Coarse particles are generally emitted from sources such as vehicles traveling on unpaved roads, materials handling, and crushing and grinding operations and windblown dust.

The federal EPA has tightened its particulate matter standards to focus on PM_{2.5}, which is inhaled more easily. It established two standards for PM_{2.5}, a 24-hour standard and an annual standard, aimed at protection from long-term and short-term exposure. The standards reflect controversial epidemiological studies that cited an association between particulate matter and mortality. The 24-hour standard is attained when, over three consecutive years, at least 98 percent of the average 24-hour PM_{2.5} concentrations per year per monitor are less than or at equal to 65 microns. A region exceeds the standard if the result is greater than 65 microns for at least one monitoring location in the region. This 24-hour limit was reduced to a 35-micron limit effective December 17, 2006. The annual standard is met when, as averaged over three consecutive years, the annual average PM_{2.5} concentration is less than or equal to 15 microns.

Critics exposed statistical errors in the epidemiological studies that resulted in the PM_{2.5} standards.¹³ The standards have been criticized as unnecessarily stringent, expensive and unlikely to improve public health.

In February 2004, the state EPD submitted to the EPA a list of 10 Georgia counties that did not meet federal standards for PM_{2.5}, but in June it recommended 26 counties be listed. The final list covers 34 Georgia counties.

Because the PM_{2.5} standard required three years of monitoring data before attainment or nonattainment could be determined, Georgia's attainment status was not determined until late 2004. EPA officially declared several areas of Georgia in nonattainment of the standard. Walker and Catoosa counties are included in the metro Chattanooga nonattainment area. All of Bibb County and portions of Monroe County have been included in the Macon nonattainment area. Floyd County itself has been declared a nonattainment area. Finally, the metro Atlanta nonattainment area has been also declared. This includes Barrow, Bartow, Carroll, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Hall, Henry, Newton, Paulding, Rockdale, Spalding and Walton counties, and portions of Heard and Putnam counties.

¹² Southern Oxidant Study, http://www.ncsu.edu/sos/pubs/sos3/State_of_SOS_3.pdf

¹³ Clear skies Initiative is Hazy,” Competitive Enterprise Institute, www.cei.org/gencon/025.03622.cfm

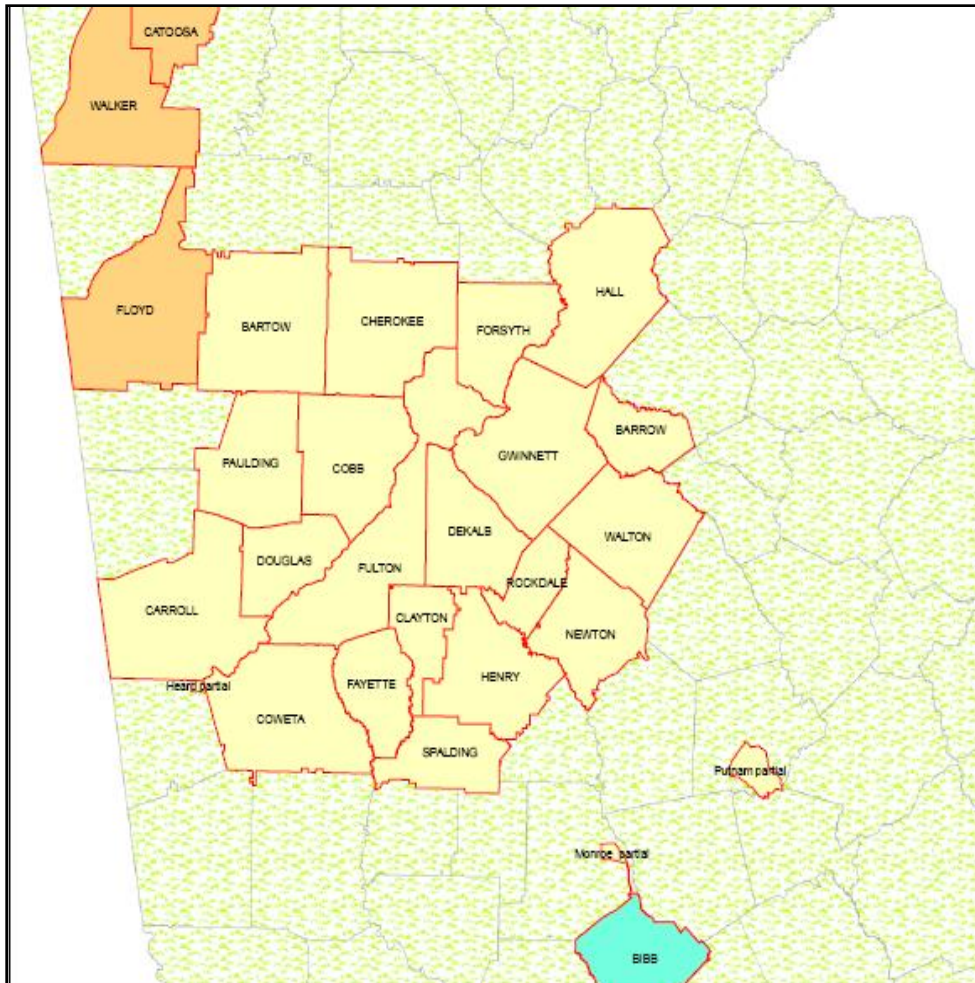


Figure 5: Georgia's PM_{2.5} nonattainment areas (Source: Georgia Environmental Protection Division)

Georgia has seen a consistent decrease in the annual PM_{2.5} concentration, according to monitoring by the state Environmental Protection Division. The EPD stated in its 2006 annual report “while variations in weather patterns have masked any recent progress in controlling annual average PM_{2.5} concentrations, significant improvement in 24-hour concentrations are visible over the same period. If this trend continues, Georgia may be able to achieve full attainment of the stricter 24-hour standard.”¹⁴

Sources of future air-quality improvements

Automobiles

Despite dramatic increases in both the number of vehicles in the metro Atlanta area and the number of miles each vehicle is driven, air quality has improved. Much of the credit must go to the improvements in emission-reduction technology. Automobiles manufactured today pollute approximately 25 times less than their 1970s counterparts. In fact, J.D. Power notes, “By 2009, all passenger vehicles will conform to

¹⁴ 2006 Ambient Air Surveillance Report, Georgia Environmental Protection Division, <http://www.air.dnr.state.ga.us/amp/report06.pdf>

standards that allow for less than 1% of the tailpipe emissions that were allowed in the 1960s.”¹⁵

At the same time, fuel refiners are producing and supplying cleaner gas and diesel – helping these vehicles run 77-95 percent cleaner. By 2007, 90 percent of the nation’s gasoline supply will be low-sulfur. Clearly, pollution will keep dropping as older vehicles are supplanted by new lower emitting, more durable models and fueled by better gasoline.

Facing tougher federal air quality standards, Texas implemented a Low Income Vehicle Repair Assistance, Retrofit, and Accelerated Vehicle Retirement Program (LIRAP) to provide funding to help low-income individuals repair or replace their old, heavily emitting cars or trucks. The vehicles replaced are removed from the road and demolished. The program, which was recently expanded to include a larger pool of eligible participants, is now called AirCheckTexas Drive a Clean Machine. Through the program, about 27,000 vouchers have been issued, with 2,820 repair vouchers redeemed and 14,411 replacement vouchers redeemed as of August 2008.¹⁶

Trucks

In 2007, more than 45,000 interstate commercial vehicles were registered in Georgia, many of them heavy-duty diesel trucks. Of the 1.7 billion tons of commodity moving to, from, within and through the metro Atlanta nonattainment region, just 35 percent terminates in the region, according to the Atlanta Regional Commission. The heavy truck traffic on Atlanta’s interstate system highlights the challenge: The vast majority of truck emissions in the metro area originate from through traffic. An emissions testing program for locally registered trucks would be futile, and would push companies to relocate and register in neighboring states, as occurred in California.¹⁷

The good news is diesel fuel’s sulfur levels dropped 97 percent in 2006. Even though the federal Environmental Protection Agency has mandated stricter diesel engine emission regulations, the fleet turnover will take considerable time; many companies stocked up on trucks before the EPA’s mandated 95-percent emissions reduction kicked in for diesel engines. A report released in March 2004 by the General Accounting Office recommended addressing concerns.¹⁸ We want to clarify that GAO is recommending that the agency consider additional steps to alleviate existing concerns, avoid a significant pre-buy of older engines, and better guarantee that the emissions and health benefits are achieved,” the GAO wrote. Recommendations include considering industry incentives, using an independent panel to assess progress and communicating with all stakeholders.

Based on the 1996 emissions inventory, heavy-duty diesel trucks produced more than half of all mobile source NOx emissions in the metro Atlanta nonattainment area. Therefore, Georgia’s air quality should continue to improve as these new regulations are implemented.

Power Plants

Emissions control measures installed in 2003 as part of the State Implementation Plan were projected to reduce NOx emissions from Georgia Power Company’s power plants to 50 percent less than they were in 1990. This is occurring while electricity generation has increased by more than 20 percent. In addition,

¹⁵ Understanding Low-emission Vehicles, J.D. Power, <http://www.jdpower.com/autos/articles/Understanding-Low-Emission-Vehicles>

¹⁶ Emission Reduction Efforts, Office of the Governor (Texas), http://governor.state.tx.us/priorities/infrastructure/natural_resources/emission_reduction_efforts/

¹⁷ Past regulations to curb smog and particulate matter from California trucks just pushed companies to border states where laws are more relaxed. Now just 2 percent of the trucks on California roads are registered here and abide by state pollution controls.” “Smog war stymied: Air quality gets worse after years of progress,” by Kerry Cavanaugh, L.A. Daily News, February 21, 2004

¹⁸ EPA Could Take Additional Steps to Help Maximize the Benefits from the 2007 Diesel Emissions Standards,” General Accounting Office, www.gao.gov/new.items/d04313.pdf

the EPA's Regional Haze Program, rules for fine particulate matter (PM2.5), and strengthened ozone standards are expected to further reduce NOx emissions from power plants over the next decade.

Challenges remain, however:

EPA rules intended to clarify what constitutes New Source Review versus routine maintenance at power plants are being challenged in court. Georgia Power's parent company, Southern Company, has challenged an EPA lawsuit that defined some work on power plants as processes triggering new source review, which requires tougher emissions controls.

Coal-fired power plants are the largest anthropogenic source of mercury in the United States; they account for 1 percent of mercury emissions globally.¹⁹ (Natural sources of atmospheric mercury include volcanoes, geologic deposits of mercury and volatilization from the ocean.) The EPA's proposed Utility Mercury Reductions Rule to reduce emissions 69 percent of that 1 percent, through the flexibility of a market-based emissions "cap and trade" system, was to take effect in 2010. The EPA is re-evaluating its approach after a federal appeals court struck down the proposal in February 2008, agreeing with critics that it violated the Clean Air Act by allowing some sources to opt out of cutbacks.²⁰

Concerns about nuclear power generation, despite its safety record and its position as a clean source of power, have led to increased regulation and cost of construction and expansion for plants in Georgia and around the nation.

Agenda

Implement an effective emissions trading system similar to the Ozone Transport Commission (OTC) in the Northeast and Mid-Atlantic, which implements a regional cap-and-trade strategy to reduce ground-level ozone.

Emissions trading programs use market forces to help find the lowest-cost emission reductions within a trading area. An emission trading program works by first setting a pollution reduction goal based on sound scientific data. Some businesses will be able to generate emission reductions meeting or exceeding the required reduction economically, while others, at the point of diminishing returns on emission-control equipment, might not be able to reduce emissions enough to meet the reduction target. In order to continue operating, those businesses must buy surplus emission credits from others. The same holds for businesses that wish to expand and for new startup businesses.

The result is that incentives are created for each facility to reduce emissions as far as possible. Those capable of generating surplus emission credits can turn them into profit, while those who cannot (often small businesses) may stay in business by buying emissions until new technology appears to let them reduce their emissions cost-effectively.

Just as encouraging vehicle fleet turnover takes advantage of new technology, barriers to technology upgrade need to be removed for point sources. An emissions trading approach would allow regulatory officials the flexibility to focus their efforts on reducing overall levels of pollutants rather than micromanaging how these entities achieve those reductions.

Emission trading programs have been used nationally, in the case of sulfur dioxide trading, and in Los Angeles, where a cap was established for VOC reductions. The Ozone Transport Commission (OTC) in the Northeast and Mid-Atlantic implements a regional cap-and-trade strategy from Virginia to Maine to reduce ground-level ozone.²¹ New control measures are sure to follow after a court vacated the EPA's

¹⁹ <http://resourcescommittee.house.gov/htmlmail/images/mercuryemissions.gif>

²⁰ http://www.washingtonpost.com/wp-dyn/content/article/2008/02/08/AR2008020802269_2.html

²¹ Ozone Transportation Commission, www.otcair.org

proposed cap-and-trade emissions programs for utilities involving sulfur dioxide (SO₂), nitrogen oxides (NO_x) and mercury. The Clean Air Interstate Rule, part of that initiative, was struck down in July 2008 by a federal appeals court that agreed that the EPA had exceeded its authority when it established the 2005 rule.²² Georgia should ensure that it participates in the discussion; its expanded nonattainment areas, coupled with new federal rules, will provide challenges in counties unprepared for emissions restrictions.

Prioritize air pollution risks

Asthma and breathing problems are frequently cited as a reason to keep young children and the elderly indoors when ozone levels are high. Yet remaining in an air-conditioned apartment may be the wrong solution. Even as air quality has improved over the decades, the reported incidence of asthma continues to climb, according to the Centers for Disease Control and Prevention.

The reason for the increase remains a mystery, but there are indications that indoor pollution, exacerbated by inadequate ventilation, is one likely cause.²³ Fire and tobacco smoke, pet dander, mold, roach droppings, cooking and cleaning fumes are all asthma triggers and suspect in a poorly vented environment. Additionally, Americans' obsession with cleanliness may be hindering children's ability to build immunity to common, everyday substances in their environment.

The same holds true for mercury emissions from power plants, which have declined considerably and are set to decrease even more. As Foundation adjunct scholar Harold Brown points out, estimated mercury emissions from power plants in Georgia in 1994 were 3,864 pounds. If that amount was equally distributed over the state, about 100 pounds would fall into Georgia waters every year because about 3 percent of the state is covered by water. The other 97 percent would fall on land and would move very slowly toward streams, if at all.²⁴

In focusing on the populist targets of automobile and power plant pollution, environmental activist groups often are doing communities a disservice by diverting attention and education efforts from areas in which impactful air quality improvements can be made.

Utilize remote sensing technology to target the small number of high polluting vehicles

The auto fleet turnover and improving technology have rendered unnecessary the mandatory emissions testing for automobiles in the metro Atlanta nonattainment area. Research has shown that in metro Atlanta just 3 percent of all vehicles on the road produce approximately one quarter of all mobile source pollution and just 10 percent of all vehicles produce approximately half of all mobile source pollution. An effective and cost-efficient strategy is one that focuses repair or removal efforts on this small number of high-polluting vehicles. A successful effort in this area could produce dramatic reductions in the expanding metro Atlanta nonattainment area; in other areas where nonattainment status is imminent, and could possibly prevent other metropolitan areas in Georgia from reaching nonattainment status.

Mandatory tests should be eliminated. Instead of that inconvenient, costly, shotgun approach, Georgia should target the high-polluting automobiles with remote sensing. Georgia Tech has pioneered the technology to cheaply scan a car's tailpipe emissions from the roadside, identify the car by its license plate and record the results.

²² State of North Carolina v U.S Environmental Protection Agency, U.S. Court of Appeals for the District of Columbia, <http://www.epa.gov/cair/pdfs/05-1244-1127017.pdf>

²³ Asthma and Indoor Environments, www.epa.gov/asthma/triggers/index.html

²⁴ "Mercury's fall from medicine to toxin," Harold Brown, www.gppf.org/article.asp?RT=6&p=pub/Environment/mercury.htm

The technology offers two possibilities. First, mobile remote sensing vans could be used to identify high-polluting vehicles. Owners of such identified vehicles would receive notice in the mail that they must have their vehicle tested and repaired within a certain time frame.

Second, the devices could be used for a voluntary “clean screen” program. These sites would essentially provide a “drive-by” emissions test. Upon passing the test the owner would receive a notice in the mail exempting their car from its next scheduled emissions test. The “clean screen” program cuts down on the number of cars tested, eliminates the hassle for many citizens, and focuses efforts on testing and repairing the dirtiest vehicles.

Any program designed to actually repair vehicles will raise serious fairness concerns involving repair costs, since high-emitters are often owned by those of limited means. Such motorists, in many cases, have little choice (in the economic sense) but to drive vehicles with high emission characteristics.

A range of options is available to help minimize the inequities caused by such a program. However, this is tricky. Subsidizing vehicle repair or offering incentives to owners who voluntarily “scrap” their vehicles pose “moral hazard” problems as people try to game the system. Grant-based programs are unlikely to produce the desired results, while being prone to abuse. Texas focuses its assistance on low-income residents.²⁵

Loan-based programs could address many economic equity concerns and minimize the potential for abuse while still putting the primary responsibility for driving a clean vehicle where it belongs – with the vehicle owner. As for who would administer such a loan program, a range of potential public-private partnerships can be envisioned.

Reduce traffic congestion.

The percentage of congested urban roadways has increased. In metro Atlanta, the annual hours of delay per person increased about 1,000 percent from 1982 to 2005. (Six hours in 1982 grew to 60 hours in 2005.) From 2000 to 2005, however, delays decreased 13 hours per person.²⁶

A large portion of the region’s deterioration in air quality is related to cars idling in congestion and frequent stops and starts. If traffic is “smoothed out” so that people are driving at a constant speed, air pollution can be reduced. Roadway expansion in the Atlanta region has not kept up with the increase in traffic volumes. Additional roadway capacity is vital to absorb the additional demand from the region’s increasing population, in combination with more convenient, accessible and economical forms of mass transit such as shuttle vans and bus rapid transit, and a congestion pricing formula that ensures traffic flow, (*For additional information, see Agenda 2009 [Section on Transportation policy](#)*).

Consider emissions-based fees.

Sport utility vehicle (SUV) owners realize that their lower gas mileage will result in higher fuel expenses, but are willing to make that tradeoff. Automobile owners should also be willing to evaluate the tradeoffs with paying more for cars that emit more pollution. A fee-based system tied to a combination of vehicle emission profile and vehicle miles driven over the course of a year could make these environmental costs explicit to owners without taking away their ability to choose those vehicles due to safety or other concerns. The fees could also be used to underwrite subsidies for other pollution control efforts.

²⁵ Emission Reduction Efforts, Office of the Governor (Texas), http://governor.state.tx.us/priorities/infrastructure/natural_resources/emission_reduction_efforts/

²⁶ Texas Transportation Institute, 2007 Urban Mobility Report, http://mobility.tamu.edu/ums/congestion_data/tables/atlanta.pdf

Lower the fixed costs of owning an automobile.

It is unrealistic to assume that a significant number of citizens will voluntarily choose not to own an automobile, even if they use transit often. There are many fixed costs that go along with owning a car that do not change even if the car sits in the garage unused; insurance and ad valorem taxes are the largest of these costs. Given these fixed costs, there is little incentive not to drive. However, there are some innovative ideas, such as pay-by-the-mile insurance, that could help change this dynamic.

Auto insurance premiums are based upon a standard estimate of how many miles a vehicle will be driven each year, so that whether you drive 5,000 miles or 50,000 miles you pay the same premium. Some insurers are now testing new products that would pro-rate the premium based upon your actual mileage. In 2007, GMAC Insurance and OnStar rolled out a Low-Mileage Discount program where Americans who drive less pay less on their auto insurance. The opt-in program was the first of its kind leveraging state-of-the-art technology to allow subscribers to save up to 54 percent on their premiums if they drive less than 15,000 miles annually.²⁷

The less one drives, the less the risk of being in a wreck, thereby limiting the risk to the insurer and the price to the consumer. Fewer vehicles on the road means less congestion, thereby reducing air pollution. These policies would be entirely voluntary, with mileage tracked by GPS (Global Positioning System) or odometers.

The University of Iowa is conducting a six-state Road User Charge Study to evaluate the technological and pricing options for approaches based on vehicle miles traveled. Oregon, which began a one-year road user fee pilot program in April 2006, reported in 2007, "Among the legitimate policies to consider when creating a mileage fee rate structure include energy use, air quality control, climate change response, resource conservation, growth management and traffic demand management, and, of course, fairness in paying for road capacity expansion."²⁸

Embrace innovative incentives to encourage use of transportation alternatives.

Allowing employees to "cash out" their employer's parking subsidies provides an incentive for individuals to choose transit over commuting by car. Studies show that on average, if an employee has to pay the cost of his or her own parking, that employee is more likely to find a way to share a ride to work. In one study, when forced to pay for parking, only 39 percent of employees drove alone, compared to 66 percent of solo commuters when employers paid parking.

A politically palatable approach that avoids levying new parking charges is "parking cash-out." With voluntary parking cash-out programs, employees can opt to surrender their parking privileges in exchange for the cash value that the employer would otherwise have to pay in order to provide them with such privileges.

By allowing employees to "cash-out" their parking privileges, researchers have estimated that Los Angeles could reduce the number of solo commuters by 20 percent as employees choose to pocket the cash and find an alternative way to get to work. Additionally, the IRS allows a fringe benefit exclusion amount of \$115 per employee for van pool costs and transit costs, while the fringe benefit exclusion amount for qualified parking for employees is \$220.²⁹

Use market incentives to encourage fleet turnover.

²⁷ http://www.onstar.com/us_english/jsp/new_at_onstar/low_mileage.jsp

²⁸ "Oregon's Mileage Fee Concept and Road User Fee Pilot Program Final Report," Oregon Department of Transportation, November 2007, http://www.oregon.gov/ODOT/HWY/RUFPP/docs/RUFPP_finalreport.pdf

²⁹ Employer's Tax Guide to Fringe Benefits, 2008, U.S. Internal Revenue Service, <http://www.irs.gov/pub/irs-pdf/p15b.pdf>

It is likely that technology will allow us to remove automobiles as a major source of air pollution in the not-so-distant future. Therefore, incentives that encourage vehicle fleet turnover will take advantage of this constant improvement in emissions technology in newer vehicles. As alternative-fueled vehicles (electric, natural gas, fuel cell, hybrid, etc.) become commercially available, more affordable and more effective, fleet turnover will provide significant air quality improvements.

Encourage market-oriented policies that increase urban tree cover, reducing impervious surface and stormwater runoff.

Urban air pollution is exacerbated by the warming associated with urban development known as the urban heat island effect. In metro Atlanta, the effect causes its temperatures to be 5 to 8 degrees Fahrenheit higher than outlying areas.³⁰ Abnormally high temperatures increase the rate of photochemical reactions that form smog, including harmful ozone concentrations.

In an effort to stay cool, city dwellers turn on their air conditioners, increasing the use of electricity produced by burning fossil fuels. The direct result is an increase in emissions that increases air pollution. Also related to development is an increase in stormwater runoff. This links air quality to water quality, because up to 90 percent of the atmospheric pollutants falling on impervious surfaces are washed into streams that feed water-supply rivers.

Pervious surfaces can be a reasonably cost-effective solution when taking into account that the higher cost of materials is offset by savings on detention ponds and other stormwater management systems.

A creative solution in urban areas, which improves air quality, water quality and aesthetics, is green roof design, in which landscaping replaces the impervious surface of a building or parking lot roof.³¹ At the Turner Entertainment Group's Atlanta campus, urban green space was created when a 2.2 acre parking lot was transformed into a landscaped green roof plaza and garden. With the resurgence of downtowns inviting more loft dwellers, green space is at a premium, and there is room in the marketplace for such innovation.

Another solution to these multiple, interrelated impacts is to adopt impact fees based on objective criteria such as impervious surface. The fees can be used to fund incentives that make it worthwhile for developers to protect trees or for reforestation grants to groups like Trees Atlanta. Fees that reflect such costs could discourage development of high-impact areas and could encourage development patterns that make better use of natural resources.

Encourage telecommuting

A common trade-off facing many Georgians is choosing between the perceived opportunities provided by the "big city" versus the quality of life of a small town. Thanks to advances in technology, including the Internet, broadband communications and the growing trend of "virtual" offices, regional offices and video conferencing abilities, it is now possible for many people to have the best of both worlds – a high-paying job and a high quality of life. Governor Sonny Perdue got the ball rolling in 2003 by announcing a telecommuting goal of 25 percent for state employees. Companies are following suit, helping to reduce the concentration of precursors for smog formation over metropolitan regions. Regional suburban offices are an easy alternative for those who need decentralized computer access. In addition to helping distribute economic growth around the state, telecommuting has the ability to reduce automobile trips

³⁰ "Welcome to the Thunder Dome: Atlanta's Urban Heat Alters Weather Patterns," Science@NASA, http://science.nasa.gov/newhome/headlines/essd26apr99_1.htm

³¹ "A Green Roof Would Have Improved Eva's Penthouse View," by Robert Ryan www.gppf.org/article.asp?search=1&p=pub/environment/greenroofs.htm

overall, and particularly in major metro areas where congestion and attaining federal air quality standards are a concern.

Further reading:

Disconnected Dots in the Mercury Debate, by Harold Brown,
<http://www.gppf.org/article.asp?RT=6&p=pub/Environment/envmercury061606.htm>

Facts, Not Fear, on Air Pollution, by Joel Schwartz,
<http://www.gppf.org/article.asp?RT=19&p=pub/AirQuality/Envairquality061215.htm>

Index of Leading Environmental Indicators, Steven Hayward,
<http://special.pacificresearch.org/pub/sab/enviro/2008/study.html>