



Georgia Regional Transportation Authority 2001 Annual Air Quality Report

# Air





January 8, 2002

Governor Roy E. Barnes  
Office of the Governor  
State Capitol  
Atlanta, Georgia 30334

Dear Governor Barnes,

We are pleased to submit the first Annual Air Quality Report of the Georgia Regional Transportation Authority (GRTA). This report fulfills the statutory requirement for GRTA to formulate measurable targets for air quality improvements and standards within the 13-county Atlanta ozone non-attainment area. The report will inform, on an annual basis, both you and the Georgia General Assembly of the air quality initiatives GRTA is currently working on and future plans.

Our mission is "to provide the citizens of Georgia with *transportation choices, improved air quality and better land use* to enhance their quality of life and promote growth that can be sustained by future generations." Taking into account the second item in the mission, GRTA has compiled a report that identifies air quality issues in the Atlanta area and how GRTA will measure the progress made towards improving air quality in the region.



The first chapter provides a brief background on air quality issues in the Atlanta area and how this has led to the formation of GRTA and its roles and responsibilities.

The second chapter identifies measures and targets that are designed to track the progress made towards improving air quality in the Atlanta region. Information is also provided on the design of strategies to reduce air pollution from transportation sources. The current measures and targets focus solely on 'on-road motor vehicle emissions, and on-ground-level ozone.' GRTA is currently working with its planning partners to develop measures and targets for additional emissions sources and pollutants. As new information is available, new or updated data will be used to expand or change the scope of the current measures and targets.

The third and final chapter of the report provides information on the existing air quality related initiatives in the Atlanta area. A brief discussion on potential air quality initiatives is also included.

The report will be updated on an annual basis and will provide the public with information on the progress made by the region in regards to air quality. GRTA's role will be to provide the leadership in developing strategies that will improve air quality for the region. GRTA will track the progress and will work with its planning partners to ensure that Federal Clean Air standards are met within the established deadlines.

Sincerely,

A handwritten signature in black ink that reads "Catherine L. Ross". The signature is written in a cursive, flowing style.

Dr. Catherine L. Ross  
Executive Director  
GRTA

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## EXECUTIVE SUMMARY

**T**HIS REPORT fulfills the statutory requirement for the Georgia Regional Transportation Authority (GRTA) to formulate measurable targets for air quality improvements and standards within the 13-county Atlanta ozone nonattainment area and to report annually such targets to the Governor [Official Code of Georgia Annotated 50-32-13 (c)].

Chapter 1 provides a brief background on air quality issues in the Atlanta area; how these issues led to the formation of GRTA; and GRTA's roles and responsibilities.

Chapter 2 presents measures and targets designed to track progress made toward improving air quality in the Atlanta area and to provide information useful in the design of strategies to reduce air pollution from transportation sources. In general, a "measure" is an observable or computable quantity, such as the concentration of ozone in the air or vehicle miles traveled per day. A "target" is a specified level for a measure and a timeframe for achieving that level. GRTA has

developed eleven measures for this report, including one or more targets for seven of the measures, which are summarized in Table 1 on the next page. The current measures and targets focus exclusively on "on-road motor vehicle emissions" and on "ground-level ozone." GRTA is currently working with its planning partners to develop measures and targets for additional emissions sources and pollutants. In addition, as new or updated information is made available, the current measures and targets may be modified or expand in scope.

Chapter 3 reviews the existing and potential air quality related initiatives in the 13-county Atlanta nonattainment area.

A measure = an observable or computable quantity

A target = a specified level for a measure and a timeframe for achieving that level

Table 1. Summary of 2001 GRTA  
Air Quality Measures and Targets

	NAME	DESCRIPTION	BASELINE		TARGET	
			VALUE	YEAR(S)	VALUE	YEAR(S)
<i>Air Quality Measures</i>	Atlanta 1-Hour Ozone Standard Attainment Status	Number of 1-hour ozone standard exceedances per year averaged over a three year period	18.3	1998–2000	≤ 1.0	2004–2006
	Ozone Days	Running three-year average of number of days during ozone season for which measured maximum 8-hour ozone concentrations fall into each of the five air quality index (AQI)-ozone sub-index levels (i.e., green, yellow, orange, red, and purple)	47.7	'98-'00	≥ 100 ≥ 130	'04-'06 '10-'12
			47.0	'98-'00	≤ 35 ≤ 23	'04-'06 '10-'12
			37.0	'98-'00	≤ 18 0	'04-'06 '10-'12
			16.7	'98-'00	0 0	'04-'06 '10-'12
			4.7	'98-'00	0 0	'04-'06 '10-'12
<i>Emissions Measures</i>	Total Daily Motor Vehicle Nitrogen Oxides (NO <sub>x</sub> ) Emissions	Total tons of NO <sub>x</sub> emitted from on-road motor vehicles during a typical summer day	304	1990	≤ 225	2004
	Average Daily Motor Vehicle NO <sub>x</sub> Emissions Per Person	Average grams of NO <sub>x</sub> emitted per person from on-road motor vehicles during a typical summer day	102	1990	≤ 54	2004
	Total Daily Motor Vehicle Volatile Organic Compounds (VOC) Emissions	Total tons of VOC emitted from on-road motor vehicles during a typical summer day	402	1990	≤ 106	2004
	Average Daily Motor Vehicle VOC Emissions Per Person	Average grams of VOC emitted per person from on-road motor vehicles during a typical summer day	135	1990	≤ 26	2004
<i>Source Measures</i>	Super-Polluters	Percentage of vehicles that are super-polluters, observed on the road and registered in the nonattainment area	3.0	1998	N/A	N/A
	Clean Fuel Vehicle Purchases	Percentage of all new vehicle purchases by covered fleets that are clean-fueled	N/A	N/A	70% light-duty; 50% heavy-duty	2001, 2002, 2003, 2004
<i>Activity Measures</i>	Total Daily Vehicle Miles Traveled (VMT)	Total summer-adjusted VMT per day in the nonattainment area (in millions)	121.6	2000	N/A	N/A
	Daily VMT Per Person	VMT per person per day in the nonattainment area	32.9	2000	N/A	N/A
	Regional Transit Ridership	Cumulative sum of the distances ridden annually by all transit passengers in the nonattainment area (in millions of passenger miles)	169.9	FY 2000	N/A	N/A

## 1. THE ISSUE DEFINED

**C**HAPTER 1 provides an overview of the status of air quality in the Atlanta area, including a description of the pollutants of concern, the sources of pollution, and emerging air quality issues in Atlanta and the rest of the State. The chapter also describes the statutory and regulatory implications of Atlanta's air quality problems which led to the formation of the Georgia Regional Transportation Authority (GRTA) in 1999. GRTA's roles and responsibilities in the effort to help improve, and eventually clean up, Atlanta's air are described.

### 1.1. AIR QUALITY

**T**he air we breathe is composed mostly of oxygen and nitrogen, with trace concentrations of countless other naturally occurring and human-made chemicals. However, some of the minor constituents, or pollutants, such as carbon monoxide (CO) and ozone, can be harmful to human health and the environment even at very low concentrations. The term "air quality" typically refers to the kinds and amounts of pollution in the air and the corresponding health and environmental impacts of the pollution.

#### 1.1.1. CURRENT AIR QUALITY ISSUES

Based on the standards set and currently being implemented by the U.S. Environmental Protection Agency (EPA), and based on the official air quality designations made by the EPA, Georgia's air quality meets the federal standards in all areas of the state except for the 13 counties surrounding and including the City of Atlanta. In the Atlanta area, the pollutant of primary concern currently is ground-level ozone. Therefore, the State of Georgia, through the Environmental Protection Division (EPD), is focusing its air-quality planning efforts and resources on reducing ground-level ozone concentrations in the Atlanta area.

#### 1.1.1.1. Ground-Level Ozone

Ozone is a highly reactive, colorless gas composed of three oxygen atoms. It has the same chemical structure miles above the earth or at ground level, and can be characterized as "good" or "bad," depending on its location in the atmosphere. "Good" ozone occurs naturally in the stratosphere, approximately 10 to 30 miles above the earth's surface, and forms a layer that protects life on earth from the sun's harmful ultraviolet rays. In the earth's lower atmosphere, ground-level ozone is considered "bad," and can be harmful to human health and the environment.

#### *Health And Environmental Effects of Ground-Level Ozone*

According to EPA<sup>1</sup>, ozone can irritate lung airways and cause inflammation similar to a sunburn. Other symptoms include wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities. People with respiratory problems are most vulnerable, but even healthy people, who are active outdoors, can be affected when ozone levels are high. Individuals who spend time outdoors in the summer are at risk, particularly children, and the elderly. Even at very low levels, ground-level ozone triggers a variety of health problems including: aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses. In addition, ground-level ozone interferes with the ability of plants to produce and store food, making them more susceptible to disease, insects, and harsh weather. High ozone concentrations can reduce crop and forest yields and increase the crops' vulnerability to disease, pests, and harsh weather.

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1. EPA, 2001a

### Ground-Level Ozone Formation

Ozone is not emitted directly into the air. At ground level, ozone is created by a reaction in the air between chemicals called nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOC) in the presence of heat and sunlight. Therefore, ground-level ozone poses the greatest problem during the hot, stagnant weather conditions of summer. In Atlanta, this period usually occurs in June, July, and August.

The chemistry of ozone formation is complex and is dependent on numerous variables. There is a variety of weather-related variables that influence ozone formation. Although changes in daily emissions of NO<sub>x</sub> and VOC can affect daily ozone concentrations, it is the daily variation in weather conditions that mostly explains the variation of ozone concentrations. Weather conditions that are conducive to ozone formation include: days when solar radiation is high; days with low wind speed; and days when there is a minimum of mixing of the air between lower and higher altitudes.

Ozone concentrations vary greatly throughout the course of the day. The morning rush hour is a significant source of NO<sub>x</sub> and VOC emissions and generally marks the daily onset of ozone formation. As the sun begins to shine, reactions between the ozone precursors begin and continue throughout the day, resulting in the formation of ozone. The afternoon rush hour emits more NO<sub>x</sub> and VOC, which further contribute to the formation of ozone. Peak concentrations of ozone are typically measured in the afternoon, between 2:00 pm and 6:00 pm. Ozone concentrations drop off significantly in the nighttime due to the lack of sunlight, which shuts down the basic photochemical cycle.

### Sources of Nitrogen Oxides Emissions

NO<sub>x</sub> is generated primarily from human-made sources. NO<sub>x</sub> is formed during the high temperatures of combustion processes by the combination of nitrogen and oxygen in the air and in the combustion fuel. The two largest sources of NO<sub>x</sub> emissions in the Atlanta area are electric-power generating plants and motor vehicles. A small portion of NO<sub>x</sub> emissions comes from industrial, residential, and commercial sources. Natural sources include NO<sub>x</sub> that is transported downward from the stratosphere, as well as from the oceans, soil, and wildfires, but these sources are relatively minor. Figure 1, right, reflects EPD's projections of the share of total NO<sub>x</sub> emissions from the various sources<sup>2</sup> in the 13-county Atlanta area in the year 2003.<sup>3</sup> EPD projects that total NO<sub>x</sub> emissions from all sources will be roughly 420 tons per day in year 2003.

### Sources Of Volatile Organic Compounds Emissions

Typically, the two largest sources of VOC emissions are mobile sources (e.g., planes, trains, automobiles, boats, construction equipment, motorized lawn equipment—generally anything that moves and burns fuel) and industrial processes. Motor vehicle exhaust and industrial emissions; manufacturing operations; nonroad activities, including boating and lawn care; gasoline vapors; and chemical solvents are some of the major sources of VOC that help to form ozone. Natural sources, specifically vegetation, account for a large portion of the VOC emissions in the

Atlanta area. Figure 2, below, reflects EPD's projections of the share of total VOC emissions from the various sources in the 13-county Atlanta area for the year 2003.<sup>4</sup> EPD projects that total VOC emissions from all sources will be roughly 1,300 tons per day in year 2003.

Figure 1. Projected NO<sub>x</sub> emissions from all sources in the 13-county Atlanta area for the year 2003.

Source: EPD, 1999

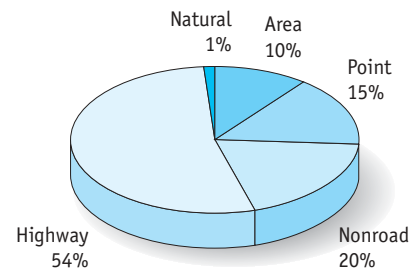
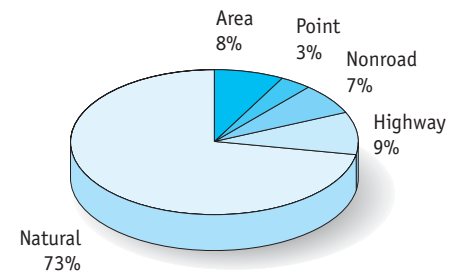


Figure 2. Projected VOC emissions from all sources in the 13-county Atlanta area for the year 2003.

Source: EPD, 1999



2. Point sources include individual, large sources of emissions, such as smokestacks from power plants and industrial plants. Area sources include numerous, relatively small sources of emissions dispersed throughout the area, such as gas stations and dry cleaners. Highway sources include the motor vehicles that operate on roads, such as cars, trucks, buses, and motorcycles. Nonroad sources include all other sources of emissions that move but do not operate on highways, such as planes, trains, boats, and lawn mowers. Natural sources include all non-human-made sources of emissions.

3. Adapted from Table 3-3 of EPD, 1999.

4. Adapted from Table 3-3 of EPD, 1999.

### **Transport Of Ozone and Ozone Precursors from Other States/Regions**

Ground-level ozone is a regional problem, and its impacts are not limited to the areas where the precursors are emitted. Even rural areas are subject to increased ozone levels, due to winds that can carry ozone and related pollutants hundreds of miles away from their original sources. Although ozone levels in a given region are most influenced by emissions in the same region, they are also influenced by emissions in upwind regions.

While Atlanta's ozone problem is probably not influenced by faraway states such as New York, Michigan and Ohio, under certain conditions, ozone blows to and from Alabama, Kentucky, Tennessee, South Carolina, and North Carolina. Therefore, the sources of ozone precursors that affect the Atlanta area are not contained solely in the 13-county area or even the 20-county Metropolitan Statistical Area.

### **1-Hour Ozone Standard**

The National Ambient Air Quality Standards (NAAQS) are health-based standards set by EPA for six air pollutants that must be met in all areas of the United States. The NAAQS for ozone that is currently being implemented by EPA is known as the 1-hour standard. This standard is based on the number of days per year that the measured concentration of ozone in the air, averaged over an hour, is 120 parts per billion (ppb) or greater. For an area to meet, or attain, the standard, the average number of days above the standard within that area must be equal to or less than one

over a three-consecutive year period. EPA designates areas that do not meet the NAAQS as nonattainment. The severity of violations of the 1-hour ozone standard is determined by the amount that the measured levels exceed 120 ppb.

#### **1.1.1.2. Atlanta Nonattainment Area**

In 1990, based on three years of monitored air quality data, EPA designated the 13 counties surrounding, and including the City of Atlanta, nonattainment under the 1-hour ozone NAAQS. The thirteen counties are: Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale. Furthermore, per the Clean Air Act (CAA), EPA classified the severity of Atlanta's air pollution problem as "Serious"<sup>5</sup> based on the measured ozone levels.

#### **1.1.1.3. Georgia State Implementation Plan**

As a result of Atlanta's nonattainment designation and classification, the CAA required EPD to develop and submit a State Implementation Plan (SIP) to EPA that demonstrated how the Atlanta nonattainment area would make timely progress toward, and attain, the 1-hour ozone NAAQS. The SIP presents a detailed description of the programs and regulations a state will use to carry out its responsibilities under the CAA. The CAA requires that EPA approve each SIP. Once EPA approves the SIP, it is federally enforceable. States that fail to submit or implement a SIP in a timely fashion are subject to sanctions under the CAA.

Therefore, in 1993, EPD submitted a 15 Percent Rate of Progress SIP to EPA that provided for VOC emissions reductions in the Atlanta nonattainment area of at least 15 percent

during the period of 1990 through 1996. In 1994, EPD submitted a 9 percent Rate of Progress SIP to EPA that provided for NOx emissions reductions of at least nine percent during the period from 1996 through 1999. EPA approved the 15 percent and 9 percent SIPs in 1999.

In accordance with the CAA, EPD was also required to submit a SIP to EPA by November 15, 1994, that demonstrated that the Atlanta area would attain the 1-hour ozone NAAQS by 1999. EPD attempted to develop an Attainment SIP, but was unable to do so by that date. EPD concluded at the time that, among other things, it appeared that levels of ozone and precursors coming into the Atlanta nonattainment area from upwind areas were often significant—sometimes over half of the current allowable ozone standard concentration. Therefore, transport from upwind emission sources appeared to be significant under certain relatively stagnant weather conditions that normally produce the highest ozone. However, the degree of contribution of upwind sources and their locations was uncertain.

Other states in the eastern U.S. also failed to submit attainment plans by the November 1994 deadline. Therefore, in 1995, Georgia began work with EPA, 36 other states, and stakeholders in a consortium known as the Ozone Transport Assessment Group (OTAG) to study the issue of transported ozone and ozone precursors. For about two years, OTAG evaluated air monitoring data, performed extensive air quality

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5. The CAA defined five classifications of ozone nonattainment areas: Marginal, Moderate, Serious, Severe, and Extreme. Areas with the most serious ozone problems were given longer to fix the problems. However, they were also required to implement more emissions reductions measures and reduce total emissions more than areas with the less serious ozone problems.

computer modeling, and developed possible VOC and NO<sub>x</sub> control strategies that could be recommended to EPA to address the common problem of transported air pollution.

Building on the recommendations of OTAG, in 1998, EPA issued a rule-making that required Georgia, 20 other states, and the District of Columbia to submit SIPs that reduce NO<sub>x</sub> emissions to address the transport of ozone<sup>6</sup>. Originally, EPA's rule required states to implement these measures by May 1, 2003. However, on August 30, 2000, the United States Court of Appeals for the D.C. Circuit issued an order extending the implementation date of the rule to May 31, 2004. Because EPD is relying on NO<sub>x</sub> emissions reductions in upwind states for Atlanta's attainment demonstration, and it cannot assume that the reductions will occur before the court-ordered implementation date, the delayed implementation date means that the earliest practicable date by which Atlanta can attain the 1-hour ozone NAAQS is 2004.

On July 17, 2001, EPD submitted to EPA a revision to the Attainment SIP that demonstrates that attainment can be accomplished by 2004. In the submittal, EPD has requested an extension of the attainment date of the 1-hour ozone NAAQS for the Atlanta nonattainment area to November 15, 2004. The request complies with EPA's guidance issued on March 23, 1999, which details the criteria that an area must meet for EPA to consider extending its attainment date. EPA has proposed approval of the submitted Attainment SIP<sup>7</sup>.

### 1.1.2. EMERGING AIR QUALITY ISSUES

EPA recently set two new NAAQS that could have a profound effect on air-quality planning in the State of Georgia. The two new standards apply to ground-level ozone and fine particulate matter. Although these standards have not yet been implemented, they have the potential to more than double the current number of counties in the State that are designated as nonattainment.

#### 1.1.2.1. Ground-Level Ozone

There are two emerging issues regarding ground-level ozone: (1) the potential reclassification of the Atlanta nonattainment area from Serious to Severe, and (2) implementation of the new 8-hour ozone standard.

#### Potential 1-Hour Ozone Reclassification

Based on Atlanta's classification as a Serious ozone nonattainment area in 1990, the CAA required the area to attain the 1-hour ozone standard by 1999.<sup>8</sup> The CAA also required EPA to determine, within six months of the applicable attainment date, whether Atlanta had indeed attained the standard. Furthermore, if EPA were to determine that the area failed to attain the standard by the prescribed date, the CAA required EPA to reclassify Atlanta to the next highest ozone nonattainment classification—Severe.<sup>9</sup>

If the Atlanta nonattainment area were reclassified to Severe, the revised CAA-prescribed attainment date would be as expeditiously as practicable, but not later than November 15, 2005. EPD has currently proposed an attainment date of November 15, 2004. In addition, the Atlanta nonattainment area would be subject to the CAA requirements

applicable to the Severe classification<sup>10</sup>, including the requirement for the sale of cleaner burning "reformulated gasoline" in the area.<sup>11</sup>

In part due to transport of ozone and ozone precursors into the area from other states, the Atlanta area did not attain the 1-hour ozone standard by 1999. Therefore, on January 17, 2001, the Sierra Club and others<sup>12</sup> filed suit in the U.S. District Court of the Northern District of Georgia against EPA for failing to reclassify Atlanta from Serious to Severe. This case is pending.

In any event, EPA has proposed to reclassify the Atlanta nonattainment area to Severe should it disapprove the submitted 2004 Attainment SIP and associated attainment date extension request.<sup>13</sup>

#### 8-Hour Ozone Standard

EPA set a new ozone NAAQS in 1997, referred to as the 8-hour ozone standard. This standard is based on the measured concentration of ozone in the air, averaged over consecutive eight-hour periods. For an area to attain the standard, the three-year average of the annual fourth-highest daily maximum 8-hour average ozone concentration in the area must be less than or equal to 80 ppb. The 8-hour ozone standard will be more difficult to attain than the 1-hour standard, but it will also provide a greater level of protection to the public against a wide range of ozone-related health effects.

6. This rule is also known as the "NO<sub>x</sub> SIP Call."

7. 66 *Federal Register* 63972.

8. CAA section 181(a)(1)

9. CAA section 181(b)(2)

10. CAA section 182(d)

11. CAA section 211(k)(10)(D)

12. Plaintiffs: Sierra Club; Southern Organizing Committee for Economic and Social Justice; Georgia Coalition for the People's Agenda; Environmental Defense Fund. Defendant: EPA Administrator.

13. 66 *Federal Register* 63972.

Due to litigation over the 8-hour ozone standard, EPA has not yet implemented the standard. It is likely that designations under the 8-hour standard will not occur until 2002 or 2003. When the standard is implemented, based on recent air quality measurements, it is likely that the Atlanta area will be designated nonattainment and may grow in coverage from the current 13 counties to as many as 21 counties. Other counties in Georgia outside the Atlanta area, such as Columbus, Augusta, and Macon, are also likely to be designated nonattainment under the 8-hour standard.

#### 1.1.2.2. Fine Particulate Matter

Particulate matter (PM) is the general term used for a mixture of solid particles and liquid droplets found in the air. Some particles are large or dark enough to be seen as soot or smoke. Others are so small they can only be detected with an electron microscope. These particles come in a wide range of sizes and originate from many different human-made and natural sources. Their chemical and physical compositions vary depending on location, time of year, and weather. "Fine" particulate matter (PM<sub>2.5</sub>) is less than 2.5 micrometers in diameter.

#### Health and Environmental Effects of Fine Particulate Matter

Studies conducted over the past several years have begun to strengthen the understanding of the relationship between PM exposure and mortality and morbidity. The Health Effects Institute's National Morbidity, Mortality, and Air Pollution Study<sup>14</sup> covering the 90 largest cities in the United States has found a generally consistent relationship between PM exposure and mortality. A study published by the Health Effects Institute<sup>15</sup> has been the basis of most U.S. and European efforts to estimate the adverse health effects of PM.

Diesel exhaust particulate matter has been cited as a probable human carcinogen by several national and international agencies (including the International Agency for Research on Cancer and EPA). This is due to findings of lung cancer in exposed workers, although the precise risk is difficult to estimate.<sup>16</sup> It has also been hypothesized that ultra fine particles and particles containing metals (e.g., iron) may be the most toxic components of the mixture. However, to date these studies have not identified a single component or characteristic that is significantly more toxic than others.<sup>17</sup> At the same time, although there has been progress in research to better understand the biological mechanism that might be causing these effects at relatively low exposure levels, there is no currently agreed-upon plausible biological mechanism explaining these health effects.

In addition to the potential health effects, fine particles are a major cause of visibility impairment in many parts of the United States.

For example, visibility in the eastern U.S. should naturally be about 90 miles, but air pollutants have reduced this range from 14 to 24 miles.<sup>18</sup> Particles can be carried over long distances by wind and then settle on the ground or water. The effects of this settling include: making lakes and streams acidic; changing the nutrient balance in coastal waters and large river basins; depleting the nutrients in soil; damaging sensitive forests and farm crops; and affecting the diversity of ecosystems.<sup>19</sup> In addition, soot, a type of PM, stains and damages stone and other materials, including culturally important objects such as monuments and statues.<sup>20</sup>

#### Sources of Fine Particulate Matter

PM<sub>2.5</sub> results from fuel combustion in motor vehicles, power generation, and industrial facilities, as well as from residential fireplaces and wood stoves. Some particles are emitted directly from their sources, such as smokestacks and cars. In other cases, gases such as sulfur oxide and sulfur dioxide, NO<sub>x</sub>, and VOC interact with other compounds in the air to form PM<sub>2.5</sub>.

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14. Health Effects Institute, 2000a.

15. Health Effects Institute, 2000b.

16. Health Effects Institute, 1999a.

17. EPA, 1999.

18. EPA, 1997a

19. EPA, 2001b

20. EPA, 2001b

21. EPA, 1997b

### **PM<sub>2.5</sub> Standard<sup>21</sup>**

PM<sub>2.5</sub> includes particulate matter that is 2.5 micrometers in diameter or smaller. EPA has set PM<sub>2.5</sub> standards with 24-hour and annual averaging times to protect against effects from short- and long-term exposure. The annual PM<sub>2.5</sub> standard is 15 micrograms per cubic meter of air (µg/m<sup>3</sup>) and the 24-hour standard is 65 µg/m<sup>3</sup>. EPA will begin designating areas as nonattainment under the PM<sub>2.5</sub> standard in 2002, based on three years of monitored data. Areas will comply with the annual PM<sub>2.5</sub> standard when the three-year average of the annual average PM<sub>2.5</sub> concentration is less than or equal to 15 µg/m<sup>3</sup>. Areas will comply with the 24-hour standard when the 98th percentile of 24-hour PM<sub>2.5</sub> concentrations in a year (averaged over three years), at the population-oriented monitoring site with the highest measured values in an area is less than 65 µg/m<sup>3</sup>.

#### **1.1.2.3. Potential Nonattainment Areas in Georgia Within the Next Seven Years**

GRTA's authorizing legislation<sup>22</sup> requires "the director of the EPD [to] report and certify to [GRTA] and the Governor...counties which are reasonably expected to become nonattainment areas under the CAA within seven years...and [to] update such report and certification every six months..." Following is a summary of the July 2, 2001, update of this report.

### **8-Hour Ozone Standard**

There is still uncertainty about what will happen to the 8-hour ozone standard and when it will be implemented. EPA has advised EPD that designations of 8-hour ozone nonattainment areas will likely not occur until 2003.

EPA's guidance was used to develop the 8-hour ozone nonattainment area recommendations the Governor made to EPA on June 30, 2000. EPD will continue to work with EPA to determine the appropriate size of any new nonattainment areas. Based on the revised standard and the ozone monitoring sites throughout the State of Georgia, which includes monitoring data through 2000, the counties listed in Table 2, below, may become nonattainment for ozone under the 8-hour ozone standard within the next seven years.

**Table 2. Georgia counties that may be designated nonattainment under the 8-Hour Ozone Standard within the next seven years**

- |              |               |
|--------------|---------------|
| 1. Richmond  | 13. Douglas*  |
| 2. Muscogee  | 14. Fayette*  |
| 3. Bibb      | 15. Forsyth*  |
| 4. Barrow    | 16. Fulton*   |
| 5. Bartow    | 17. Gwinnett* |
| 6. Carroll   | 18. Hall      |
| 7. Cherokee* | 19. Henry*    |
| 8. Clayton*  | 20. Newton    |
| 9. Cobb*     | 21. Paulding* |
| 10. Coweta*  | 22. Rockdale* |
| 11. Dawson   | 23. Spalding  |
| 12. DeKalb*  | 24. Walton    |

\* Currently designated nonattainment under the 1-hour ozone standard

### **PM<sub>2.5</sub> Standard**

New PM<sub>2.5</sub> monitors were deployed beginning in 1999 to gather the three years of data needed to determine attainment or nonattainment of the PM<sub>2.5</sub> standard. Based on initial monitoring data collected in 1999 and 2000, almost all of the counties in which monitors are located are indicating concentrations of PM<sub>2.5</sub> above the annual standard. This appears to be a common trend throughout the southeast and many other parts of the country. While EPD needs to continue monitoring for the full three years, and EPA is now reviewing the standard, there is reasonable expectation that the counties listed in Table 3 may become nonattainment under the PM<sub>2.5</sub> annual standard within the next seven years.

Based on discussions with EPA, designations for the new PM<sub>2.5</sub> standard could occur between 2004–2006. EPD will continue to work with EPA on the timing and implementation of the PM<sub>2.5</sub> standard.

**Table 3. Georgia counties that may be designated nonattainment under the PM<sub>2.5</sub> standard within the next seven years**

- |              |                |
|--------------|----------------|
| 1. Bibb      | 11. Gwinnett   |
| 2. Chatham   | 12. Hall       |
| 3. Clarke    | 13. Houston    |
| 4. Clayton   | 14. Lowndes    |
| 5. Cobb      | 15. Muscogee   |
| 6. DeKalb    | 16. Paulding   |
| 7. Dougherty | 17. Richmond   |
| 8. Floyd     | 18. Washington |
| 9. Fulton    | 19. Walker     |
| 10. Glynn    | 20. Wilkinson  |

21. EPA, 1997b

A map of the counties that are currently designated nonattainment under the 1-hour ozone standard and those counties that are reasonably expected to become nonattainment under the 8-hour ozone and PM<sub>2.5</sub> standards within the next seven years is presented in Figure 3, right.

Although the details regarding implementation of the 8-hour ozone and PM<sub>2.5</sub> standards must still be worked out by EPA, it is anticipated that EPD will be required to develop SIPs for each area designated nonattainment under the standards. In addition, GRTA's jurisdiction will extend to all areas designated nonattainment by EPA within the State.

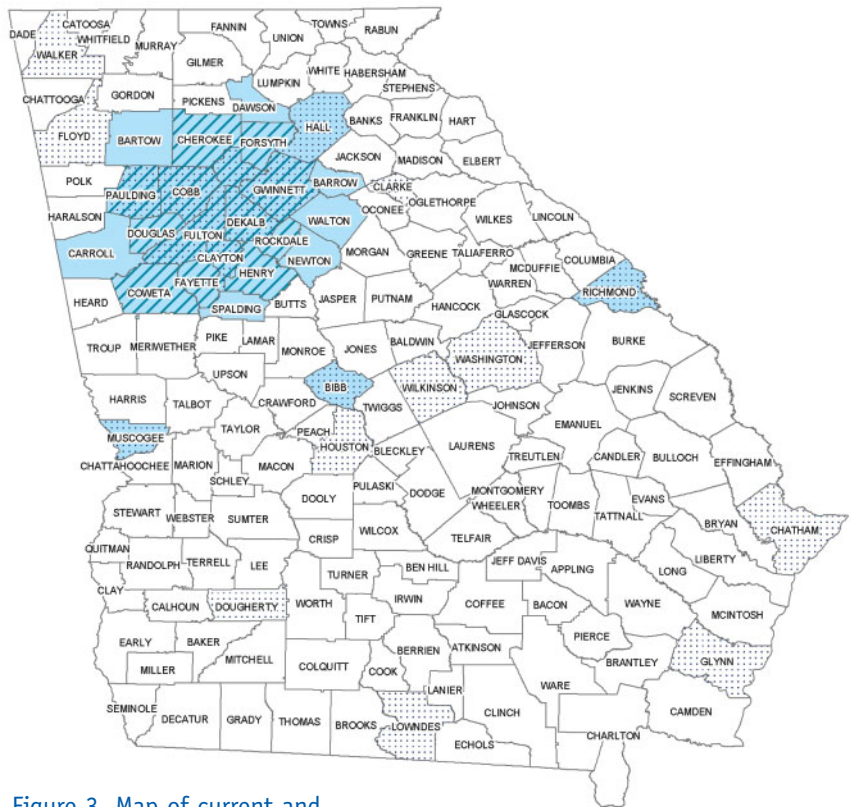





Figure 3. Map of current and potential future nonattainment areas

-  Existing 1-hour ozone nonattainment
-  Proposed 8-hour ozone nonattainment
-  Potential PM<sub>2.5</sub> nonattainment

## 1.2. THE GEORGIA REGIONAL TRANSPORTATION AUTHORITY

GRTA was created in 1999 with the mission “to provide the citizens of Georgia with transportation choices, improved air quality, and better land use in order to enhance their quality of life and promote growth that can be sustained by future generations.” To this end, GRTA has adopted the following vision statement:

- The Authority will work to plan and implement a transportation system that is multi-modal, seamless, and accessible to all citizens.
- The Authority will encourage land use policies that promote efficient use of infrastructure investments.
- The Authority will operate within a decision-making framework that values public participation and connects transportation choices, land use and the overall Quality of Life.
- The Authority will serve the best interests of the region by working in cooperation with other agencies and governments that are involved in planning and transportation.
- The Authority will measure its effectiveness in improving air quality, traffic, accessibility and land use.

### 1.2.1. HISTORY

The initial impetus for the studies and legislation that led to the formation of GRTA may be traced to a significant moment in Atlanta’s air quality, transportation, and land use planning processes: the start of the “transportation conformity lapse” on January 17, 1998.

#### 1.2.1.1. Transportation Conformity Lapse

Before they may be implemented, the CAA requires the U.S. Department of Transportation (U.S. DOT)<sup>23</sup> and the appropriate metropolitan planning organization,<sup>24</sup> or state department of transportation, to determine that transportation plans, programs, and projects located within nonattainment areas (such as Atlanta) and which require Federal funds or approval, are consistent with, or “conform to,” the applicable SIP’s purpose of reducing air pollution and/or attaining the NAAQS. If the U.S. DOT cannot make such a conformity determination within the timeframe prescribed by the transportation conformity regulations<sup>25</sup>, then the area falls into a transportation conformity “lapse.”

On January 17, 1998, a transportation conformity lapse began in the Atlanta nonattainment area. This occurred because the Atlanta Regional Commission (ARC), the Georgia Department of Transportation (GDOT), and the U.S. DOT were unable to determine that Atlanta’s Regional Transportation Plan (RTP)<sup>26</sup> conformed to the applicable SIP. As a result, hundreds of millions of dollars in Federal transportation funds in the nonattainment area were restricted to projects that would either have no impact on air quality or would improve it. For example, Federal funds could be spent on safety improvements to roadways, but not

on capacity-increasing projects, such as road widenings or new roadways.

The lapse ended on July 25, 2000, but the impact it had on transportation, air quality, and land use planning in the Atlanta area is still evident. In particular, the lapse spurred the development of GRTA and helped galvanize interagency cooperation and coordination among GRTA, EPD, GDOT, ARC, EPA, the Federal Highway Administration, and the Federal Transit Administration, among others.

#### 1.2.1.2. The GRTA Proposal

The conformity lapse was the last straw for many in the region who had watched these problems progress from the days of highway construction and little congestion to major traffic problems. Other issues included isolation of many in the region without access to transportation, lack of alternatives to the single occupant vehicle, and deteriorating air quality.

#### *Initial Metro Atlanta Transportation Initiative Report*

One group of organizations representing businesses, community groups, environmental groups, universities, state agencies, and transportation organizations came together in July 1998 to discuss the transportation-related issues facing the Atlanta region. This group collectively became known as the Metro Atlanta Transportation Initiative (MATI), under the auspices of the Metro Atlanta Chamber of Commerce. Each

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24. The “conformity determination” is made by the Federal Highway Administration and the Federal Transit Administration. The Atlanta Regional Commission is responsible for making transportation conformity determinations for 10 of the 13 counties in the Atlanta nonattainment area. The Georgia Department of Transportation is responsible for the remaining three counties.

25. CFR 93 Subpart A.

26. The Regional Transportation Plan is the 20+ year plan for transportation projects to be implemented in the region.

representative in the group recognized the short-term and the long-term implications of both traffic congestion and of the loss of federal transportation funds resulting from a non-conforming RTP. MATI devised a three-phase approach to the process consisting of a report outlining the traffic situation in the Atlanta area; an interview process with leaders in the region; and a survey of other areas' solutions to similar traffic problems. Recommendations were formed and submitted to then Governor-elect Roy Barnes. The seven recommendations<sup>27</sup> were:

1. Set and communicate near-term and long-term performance objectives for the Atlanta region transportation system to elevate the focus and visibility of our aspiration of improving regional mobility, safety, and environmental impact.
2. Adopt aspirations-based strategic planning and land-use compliance incentives to strengthen the leadership role of planning and encourage exploration of creative solutions to reach our aspirations.
3. Create a regional transit authority to promote and support local county transit initiatives while ensuring regional effectiveness.

4. Develop a comprehensive financial resource plan to develop a clear understanding of future financial requirements and explore the full range of creative financing options that will ensure metro Atlanta has adequate and flexible funding for its road and transit needs.
5. Execute a coordinated transportation awareness campaign to educate the public about important transportation issues and build awareness, acceptance, and usage of alternatives to single occupant vehicle travel.
6. Mobilize public and private employers to support these recommendations and help change behavior via workplace initiatives.
7. Empower a regionally focused agency with integrated responsibility for planning, resource allocation/authority, and monitoring of implementation for all forms of transportation in the Atlanta region to achieve a stronger alignment of authority and accountability for meeting regional transportation system aspirations.

Through the creation of GRTA in Senate Bill 57, Governor Barnes addressed many of the recommendations set forth in the MATI document. The most obvious is the seventh recommendation that specifically calls for an agency with the same powers granted to GRTA through legislation. Additionally, GRTA addresses or can address many of the other recommendations such as developing near-term and long-term performance objectives. GRTA has developed goals and objectives and is in the process of developing measures and targets to gauge

the region's progress towards the goals of improving air quality, mobility and accessibility, coordination of land use and transportation decisions, and equitable transportation. Additionally, one of GRTA's largest studies, the Regional Transit Action Plan (RTAP), will examine transit in the Atlanta nonattainment area and develop a plan to implement a seamless regional transportation system.

In October 2000, MATI gave a report on the progress of the recommendations indicating that, while the region has made obvious strides towards solving some of the traffic congestion issues, the region has a great deal more to accomplish. GRTA was recognized as creating more opportunities for transportation choices in the region such as the RTAP study, Clayton County Transit (C-TRAN), and working with other planning partners to coordinate passenger rail efforts. All of these efforts not only assist the region in terms of traffic congestion, but also aim to alleviate some of the air quality problems within the region. Thus, while MATI was essential in GRTA's formation, the legislation that created GRTA was aimed at going beyond the MATI recommendations not only seeking to relieve traffic congestion, but also to improve Atlanta's air quality. This is a focal point in ensuring the continued flow of federal transportation funds, business vitality of the region, and preserving the quality of life for Atlanta's residents and visitors.

27. Metro Atlanta Chamber of Commerce, 1998.

### 1.2.1.3. Passage of GRTA Legislation

GRTA was formed by the Georgia Regional Transportation Authority Act of 1999.<sup>28</sup> The Authority was created for the purposes of managing land transportation and air quality within air quality nonattainment areas of the State, as defined by EPA in the Code of Federal Regulations (CFR). The Atlanta metropolitan region is presently the only nonattainment area within the State.

The Atlanta nonattainment area consists of thirteen counties, with ten counties being under the jurisdiction of the metropolitan planning organization, the ARC. The ten counties are: Cherokee, Clayton, Cobb, Dekalb, Douglas, Fayette, Fulton, Gwinnett, Henry, and Rockdale. The remaining three counties, Coweta, Forsyth, and Paulding, rely on GDOT to include projects into the RTP and the Transportation Improvement Program (TIP). The Authority's jurisdiction over these counties continues until 20 years after the area has been re-designated as in attainment by EPA.

### 1.2.2. ROLES AND RESPONSIBILITIES

Within its jurisdiction, GRTA's major responsibilities include:

- To plan, design, construct, improve, operate, and maintain (or cause to be operated and maintained) land public transportation systems and other land transportation projects... air quality installations, and all facilities and appurtenances necessary or beneficial thereto...<sup>29</sup>
- To coordinate planning for land transportation and air quality purposes.<sup>30</sup>
- To enter into leases, contracts, and agreements or loan, grant, or extend credit to local governments within its jurisdiction to further the purposes of GRTA.<sup>31</sup>
- To review and make recommendations to the Governor on all land transportation plans and transportation improvement plans or to assume Governor-delegated power to approve statewide transportation plans, and TIPs.<sup>32</sup>
- To determine access management on all roads except interstate highways.<sup>33</sup>
- To ensure that any project funded by the authority with federal funds is in compliance with the CAA.<sup>34</sup>
- To report annually to the Governor air quality targets and a timetable and progress assessment at achieving the targets.<sup>35</sup>
- To approve or deny Development of Regional Impact (DRI)-related State and Federal transportation funding.<sup>36</sup>
- To withhold state grants from jurisdictions without cooperating local government status for purposes other than physical and mental health, education, and police protection.<sup>37</sup>

The authority's responsibilities have been broadly interpreted, but the key authority that GRTA holds is the ability to coordinate transportation and air quality planning and project implementation within current and potential nonattainment areas. GRTA has exercised many of these powers and has implemented various projects and programs that address its many responsibilities. Moreover, within the last two years, GRTA has been setting the framework to implement strategies to better address transportation and air quality issues within the region. Listed below are the identified responsibilities as well as GRTA undertakings to address them:

- To plan, design, construct, improve, operate, and maintain (or cause to be operated and maintained) land public transportation systems and other land transportation projects, air quality installations, and all facilities and appurtenances necessary or beneficial thereto...<sup>38</sup> Examples include:
  - Clayton County Transit
  - Greyhound Quicklink
  - RTAP

28. Official Code of Georgia Annotated (O.C.G.A.) 50-32

29. The O.C.G.A. 50-32-11(3); 50-32-11(4). Air quality installations have not yet been defined by the agency.

30. O.C.G.A. 50-32-11(27).

31. GRTA cannot enter into debt, therefore any of the financial arrangements entered into must be supported by an identified and dedicated revenue source.

32. O.C.G.A. 50-32-11(a)(29); 50-32-13(a); 50-32-13(b)(1). This is only applicable if the Governor, by executive order, delegates this authority.

33. O.C.G.A. 50-32-11(a)(33).

34. O.C.G.A. 50-32-11(a)(38).

35. O.C.G.A. 50-32-13(c).

36. O.C.G.A. 50-32-14; Three-fourths vote by a county commission or city council can overrule GRTA's decision.

37. O.C.G.A. 50-32-53; GRTA has yet to define cooperating local governments.

38. O.C.G.A. 50-32-11(3); 50-32-11(4).

Air quality installations have not yet been defined by the agency.

- Northwest Connectivity Study
  - Northern Sub Area Study/ GA 400 Study
  - Speed Study
  - Heavy-Duty Diesel Retrofit Study
  - Clean Cities Contract
  - Buckhead Shuttle
  - Smart Corridor Study
  - Perimeter Connectivity Study
  - Joint Land Use Strategy (with ARC)
- To coordinate planning for land transportation and air quality purposes.
    - Strategies for Metropolitan Atlanta’s Regional Transportation and Air Quality (SMARTRAQ)
    - Value Pricing Conference
  - To enter into leases, contracts, and agreements or loan, grant, or extend credit to local governments within its jurisdiction to further the purposes of GRTA.<sup>40</sup>
  - To review and make recommendations to the Governor on all land transportation plans and transportation improvement plans or to assume Governor-delegated power to approve statewide TIPs, transportation plans, and transportation improvement programs.<sup>41</sup>
  - To determine access management on all roads except interstate highways.<sup>42</sup> *GRTA has not yet developed a policy on access management; thus it has not yet exercised this responsibility.*
- To ensure that any project funded by the authority with federal funds is in compliance with the CAA.<sup>43</sup> Examples include:
    - TIP Approval (must be a conforming TIP)
    - Buckhead Shuttle (electric vehicles)
    - Clean Cities Contract (alternative fueling stations)
    - Clayton County Transit (Compressed Natural Gas (CNG)-fueled buses with bicycle racks)
  - To report annually to the Governor air quality targets and a timetable and progress assessment at achieving the targets.<sup>44</sup> Example includes:
    - 2001 Air Quality Report
  - To approve or deny DRI-related State and Federal transportation funding.<sup>45</sup>
    - *The GRTA Board unanimously approved the DRI policy at the regularly scheduled Board meeting on November 14, 2001. This policy will go into effect in the 13 county nonattainment area on January 14, 2001.*
  - To withhold state grants from jurisdictions without cooperating local government status for purposes other than physical and mental health, education, and police protection.<sup>46</sup>
    - GRTA has yet to define cooperating local government; thus has not yet exercised this responsibility.

Additional projects will be implemented, including components of the Governor’s Transportation Choices Initiative, which will continue to fulfill many of GRTA’s responsibilities. Additionally, since many of these responsibilities have yet to be defined by GRTA, there is the potential for GRTA to play an even greater role in integrating transportation and air quality planning in the region.

Thus, every transportation project that GRTA implements or causes to be implemented should contribute to improved air quality, better land use, more transportation choices, and a seamless, more efficient transportation system.

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39. O.C.G.A. 50-32-11(27)

40. GRTA cannot enter into debt, therefore any of the financial arrangements entered into must be supported by an identified and dedicated revenue source.

41. O.C.G.A. 50-32-13(a) and 50-32-13(b)(1); 50-32-11(a)(29); This is only applicable if the Governor, by executive order, delegates this authority.

42. O.C.G.A. 50-32-11(a)(33)

43. O.C.G.A. 50-32-11(a)(38)

44. O.C.G.A. 50-32-13(c).

45. O.C.G.A. 50-32-14; Three-fourths vote by a county commission or city council can overrule GRTA’s decision.

46. O.C.G.A. 50-32-53.

## 2. MEASURES AND TARGETS

**G**RTA's enabling legislation states that it shall "formulate measurable targets for air quality improvements and standards...and annually shall report such targets to the Governor." GRTA's jurisdiction currently covers the Atlanta 1-hour ozone nonattainment area, and, therefore, the measures and targets described in this report apply only to that portion of the State.

In general, a "measure" is an observable or computable quantity, such as the concentration of ozone in the air or vehicle miles traveled (VMT) per day that provides useful information regarding the state of the air quality or important factors that affect air quality.

A "target" is both (1) a specified level for a measure and (2) a time-frame for achieving that level that should lead to air quality improvements. However, not every measure in this report has an associated target. At this time, the Authority has chosen not to develop targets for some of the measures, particularly for years beyond 2004. This is because there is currently not sufficient data available to ensure that such targets would be reliable, self-consistent, and, if attained, actually support attainment of the air quality targets. GRTA is continuing to work with its air quality and transportation planning partners to develop targets for these measures.

GRTA's targets are non-binding goals or aspirations that help guide GRTA in the transportation and air quality planning processes and in the development of needed transportation and air quality policies, programs, and projects. These measures and targets are intended to provide information to decision makers, and as such, carry no legal ramifications for failure to achieve them. In cases where GRTA develops a target that is required by law or regulation, such as attaining the NAAQS by a certain date, there would be no additional legal ramifications for failure to achieve the target besides those

that already apply. Furthermore, GRTA may develop targets for measures that are not under the full or direct control of GRTA's programs, but, if attained, would provide the region with more transportation choices and improved air quality. Coordination with agencies that have more direct influence over such measures is essential in order to set challenging, yet realistic, targets.

GRTA has developed eleven measures and one or more targets for seven measures that are grouped into four broad categories. GRTA will track these measures and report on the progress made toward meeting the targets on an annual basis. This should provide frequent opportunities to develop and adjust strategies as needed to meet the targets. The four categories of measures and targets are described below and the relationship between the categories is depicted in Figure 4.

Figure 4. Relationship between the four categories of measures and targets



**Air Quality.** These measures are based on EPD's ozone monitoring data and on the NAAQS. The air quality measures will provide the ultimate assessment of the progress made toward meeting the NAAQS in Atlanta. The two air quality measures are:

- Atlanta 1-Hour Ozone Standard Attainment Status, and
- Ozone Days.

GRTA has developed targets for both measures.

**Emissions.** Air quality is the result of the interaction of many different factors, including temperature, humidity, wind speed, sunlight, pollutant chemistry, geography, and the kinds and amounts of pollutants emitted into the air. GRTA has developed measures and targets for transportation-related VOC and NO<sub>x</sub> emissions based on EPD's proposed motor vehicle emissions budgets for the year 2004. The emissions measures and targets provide a framework within which transportation plans, programs, and projects may be designed and evaluated. The four emissions measures are:

- Total Daily Motor Vehicle NO<sub>x</sub> Emissions,
- Average Daily Motor Vehicle NO<sub>x</sub> Emissions Per Person,
- Total Daily Motor Vehicle VOC Emissions, and
- Average Daily Motor Vehicle VOC Emissions Per Person.

GRTA has developed targets for each of these four measures.

**Sources.** These measures focus on the sources of emissions. The measures will provide data on the penetration of low emissions vehicles into public and private fleets and on the fraction of very dirty, or "super polluting," vehicles on the road. This information will be useful, for example, for designing programs to accelerate the introduction of clean vehicles into use and to clean up or accelerate the removal of dirty vehicles. In the future, these measures could be modified to monitor the effectiveness of new technologies such as heavy-duty diesel vehicle emissions controls retrofits and alternatively fueled vehicles. The two sources measures are:

- Super Polluters, and
- Clean Fuel Vehicle Purchases.

GRTA has developed targets for the "Clean Fuel Vehicle Purchases" measure.

**Activities.** These measures focus on the usage of motorized vehicles and transit, which affect emissions. The measures should be useful for designing and evaluating plans, programs, and projects that affect activity levels, thereby reducing emissions and improving air quality. The three activities measures are:

- Total Daily VMT,
- Daily VMT Per Person, and
- Regional Transit Ridership.

GRTA has not developed targets for these measures.

At this time, the measures and targets focus exclusively on on-road motor vehicle (e.g., cars, trucks, buses, motorcycles) emissions sources and on the ground-level ozone pollutant, as conceptualized in Table 4 on the next page. However, there are other emissions sources in the Atlanta region—nonroad mobile (e.g., construction equipment, aircraft, trains, boats, lawn mowers), point (e.g., power plants, factories), area (e.g., gas stations, dry cleaners), and biogenic (e.g., plants)—and other pollutants of concern (e.g., PM<sub>2.5</sub>, toxics). GRTA is working with its planning partners to identify and collect the data needed to develop measures and targets for other emissions sources and pollutants in the future. In addition, as new or updated information is made available, the current measures and targets may change or expand in scope.

The eleven measures and the targets for seven targets, including baseline values<sup>47</sup>, are described in detail in the sections that follow.

## 2.1. AIR QUALITY MEASURES AND TARGETS

The air quality measures will provide the ultimate assessment of the progress made toward meeting the NAAQS in Atlanta.

### 2.1.1. ATLANTA 1-HOUR OZONE ATTAINMENT STATUS

This measure tracks the average number of exceedances of the 1-hour ozone NAAQS per year in the Atlanta nonattainment area over each consecutive three-year period. The measure is based on the way that attainment of the 1-hour ozone standard is assessed. In order to attain the 1-hour ozone standard, the consecutive three-year average number of days exceeding the standard must be one or less. This is equivalent to a total of three exceedances or less over a three-year period.

The number of days per year exceeding the 1-hour ozone standard is determined by EPD based on observations from 12 measuring sites located within the Atlanta nonattainment area. The Atlanta 1-hour ozone attainment status measure is essentially determined by computing the arithmetic mean of the number of exceedance days per year for each set of consecutive three-year periods.<sup>48</sup> Should the computed measure equal one day or less for a given three-year period, then the area would meet the 1-hour ozone standard.

The control strategies contained in the Georgia SIP are designed to reduce the emissions and concentrations of ozone precursors—NO<sub>x</sub> and VOC—hence decreasing ozone formation and improving air quality. Some controls are already in place and others are to be implemented by May 1, 2003, or another future date. Their implementation will lead to attainment of the 1-hour ozone standard by the year 2004. GRTA will play a proactive role in this process by identifying new control strategies and additional areas of application so that the statutory requirements for achieving attainment can be met more aggressively.

Figure 5 on the next page depicts the historical trend of the Atlanta 1-Hour Ozone Attainment Status measure. The baseline of the measure is 18.3 exceedance days per year over the 1998-2000 period. Based on EPD's proposed Attainment SIP, GRTA is developing a target for this measure of an average of no more than one exceedance day over the 2004-2006 period.

The benefit of this measure is that it tracks the status of air quality in the Atlanta nonattainment area, and it may be used to assess the effect on air quality of the implementation of all of the various control strategies and programs that reduce NO<sub>x</sub> and VOC emissions.

### 2.1.2. OZONE DAYS

The official ozone season is designated as the 153 days each year from May 1st until September 30th, although ozone concentrations may sometimes exceed the NAAQS on days outside of the official season. During this ozone season, conditions are typically favorable for elevated concentrations of ground-level ozone due to a combination of heat, sunlight, other favorable meteorological conditions, and an abundance of ozone precursors. EPA has determined that elevated levels of ambient ozone pose a risk to human health. When ambient ozone concentrations exceed the NAAQS in an area, the air for that day is considered unhealthy for the population working and living in the area. While there is no ambient ozone concentration that is considered healthy, and there are no discrete levels at which the deleterious effects of ozone exposure become more pronounced, as ozone levels increase, the number of individuals likely to be adversely affected also increases. Therefore, in an effort to measure the progress the region is achieving toward reducing exposure rates and attaining the health-based ozone standards, GRTA has chosen to track the number of days per ozone season that the observed 8-hour ozone concentrations fall within one of five discrete levels.

EPA's air quality index (AQI) is an index for reporting daily air quality. It tells how clean or polluted the air is and the associated health concerns. The AQI focuses on health effects that can happen within a few hours

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47. A "baseline" is (1) a recent estimate or observation of a measure and (2) the time period in which it was observed. The baseline provides a benchmark against which changes or general trends of a measure and/or progress toward achieving a target may be assessed.

48. 40 Code of Federal Regulations (CFR) Part 50

Table 4. Source and pollutant: scope of 2001 report

		SOURCES	
		ON-ROAD MOTOR VEHICLES	OTHER (E.G., POINT, AREA, ETC.)
POLLUTANTS	OZONE	Covered in this report	Future annual reports
	OTHER (E.G., PM <sub>2.5</sub> )	Future annual reports	Future annual reports

or days after breathing polluted air. EPA uses the AQI for five major air pollutants regulated by the CAA: ground-level ozone, PM, CO, sulfur dioxide, and nitrogen dioxide. GRTA's measure, however, tracks only one pollutant—ozone—and only during the ozone season. The maximum daily 8-hour concentration for all twelve monitors in the Atlanta nonattainment area determines the AQI-ozone sub-index for that day. For example, if the highest 8-hour

average reading from all twelve monitors is 73 ppb, then, as shown in Table 5, this falls into the range of 65 to 84 ppb and equates to an AQI-ozone sub-index between 51 and 100, which is denoted by the color yellow. That day is then rated as yellow, for which EPA recommends that unusually sensitive people should consider limiting prolonged outdoor exertion. The ozone day measure and targets are depicted in Figure 6 on the following page.

Figure 5. Average number of 1-hour Ozone Standard exceedances over a three-year period

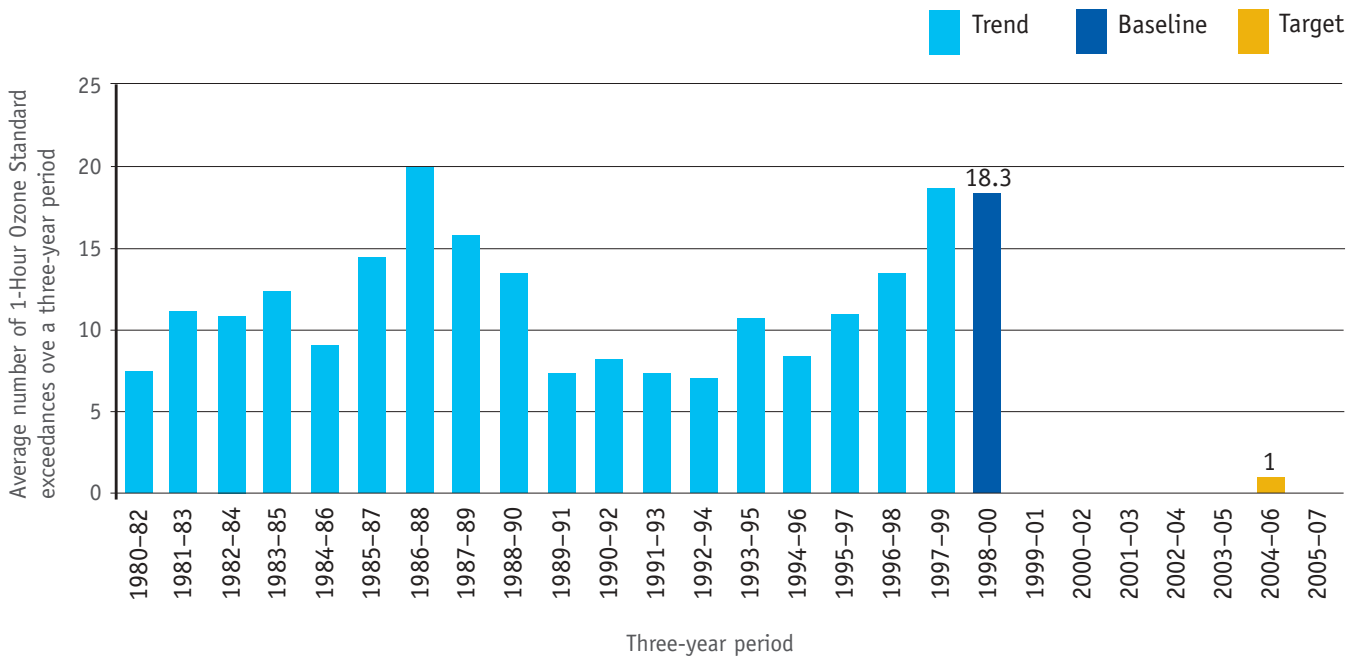
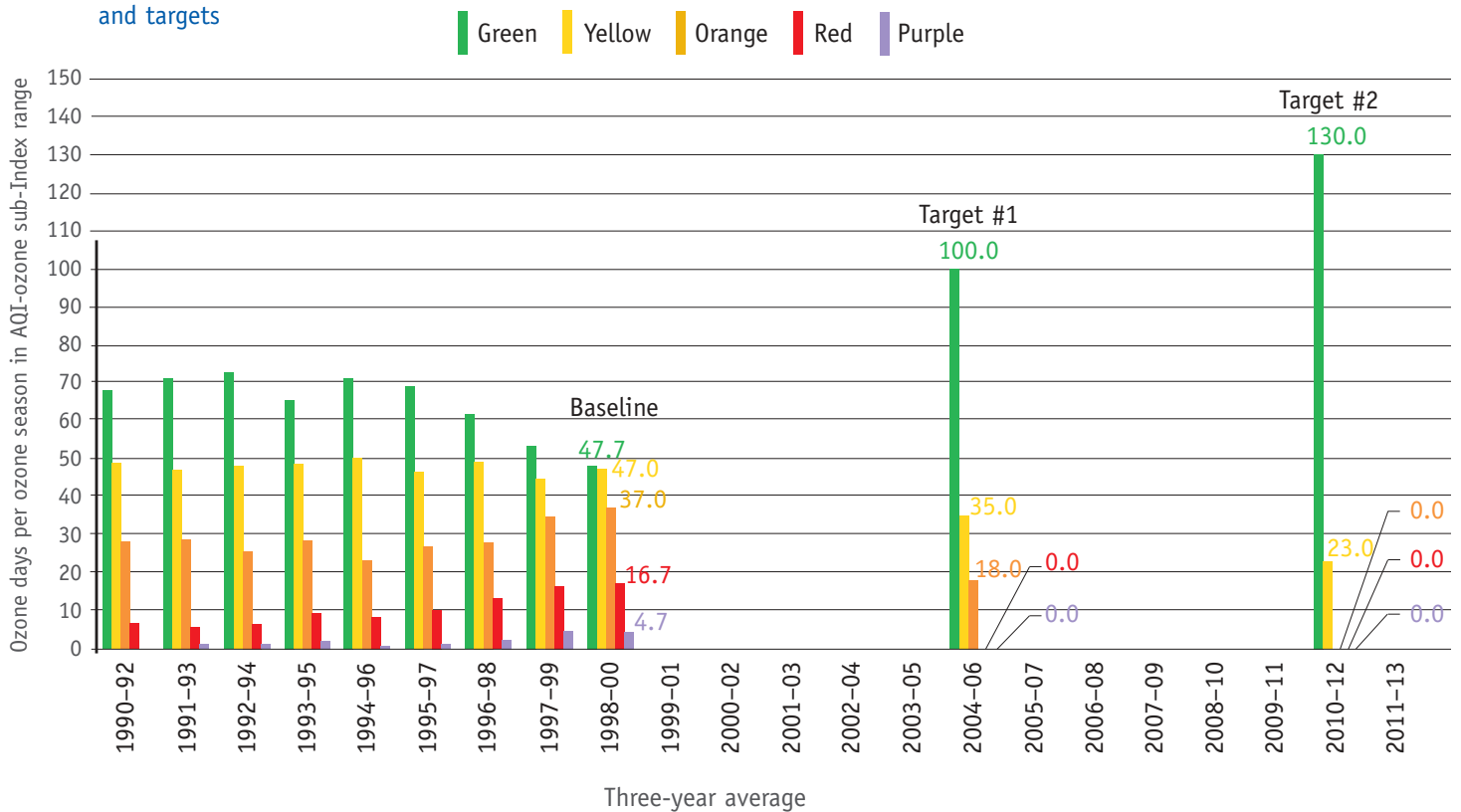


Table 5. Characteristics of AQI-ozone sub-index

COLOR	EPA'S LEVELS OF HEALTH CONCERN	INDEX VALUES	DAILY MAXIMUM 8-HOUR OZONE CONCENTRATIONS (PPB)	EPA'S CAUTIONARY STATEMENT
Green	Good	0–50	0–64	None
Yellow	Moderate	51–100	65–84	Unusually sensitive people should <i>consider limiting prolonged</i> outdoor exertion.
Orange	Unhealthy for sensitive groups	101–150	85–104	Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
Red	Unhealthy	151–200	105–124	Active children and adults, and people with respiratory disease, such as asthma, should <i>avoid prolonged</i> outdoor exertion; everyone else, especially children, should <i>limit prolonged</i> outdoor exertion.
Purple	Very unhealthy	Greater than 201	125–374	Active children and adults, and people with respiratory disease, such as asthma, should <i>avoid all</i> outdoor exertion; everyone else, especially children, should <i>limit</i> outdoor exertion.

Figure 6. Ozone days measure and targets



## 2.2. EMISSIONS MEASURES AND TARGETS

On-road motor vehicles (e.g., cars, trucks, buses, motorcycles) emit a significant portion of the VOC and NO<sub>x</sub> that contribute to ground-level ozone formation in the Atlanta nonattainment area. Therefore, GRTA has developed four measures<sup>49</sup> that will aid in the development and evaluation of strategies to reduce pollution from these sources. These four measures apply only to on-road motor vehicle emissions in the Atlanta nonattainment area.

GRTA has developed targets for these four measures for the year 2004. Target values for years beyond 2004 have not yet been proposed. In order to do this, future trends in emissions from all other sources (e.g., industry, power plants, nonroad motor vehicles), their potential affects on air quality, and possible control strategies must also be evaluated. GRTA is working together with EPD, ARC, and other planning partners to develop future year target values.

There are two basic ways to reduce on-road motor vehicle emissions in order to achieve the targets:

(1) reduce the emissions generated by motorized modes of travel, and (2) reduce the amount of motorized travel. Some examples of the first strategy are testing vehicle emissions and repairing vehicles that fail the test, using cleaner-burning fuels, reducing very high speeds on Interstates, and easing traffic congestion. Some examples of the second strategy are shifting travel from drive-alone vehicles to high-occupancy vehicles (HOV) and mass transit, locating development at sites that generate lower average trip lengths, and designing developments that encourage pedestrian activity and allow people to satisfy trip needs by walking or bicycling.

Over the next five years, GRTA will be providing new transportation choices to metro Atlantans, including viable options to make trips throughout the region in less-polluting ways. For example, GRTA will be implementing commuter express bus, regional vanpool, and activity center circulator services. In addition, GRTA will evaluate proposed Developments of Regional Impact's based in part on their emissions performance. DRI that are located and designed in ways that reduce regional on-road motor vehicle emissions will be more likely to receive GRTA's approval for transportation funds.

The four emissions measures and targets are described in detail below.

### 2.2.1. TOTAL DAILY MOTOR VEHICLE NO<sub>x</sub> EMISSIONS

This measure tracks the total amount of NO<sub>x</sub> emitted from on-road motor vehicles during a typical summer day.<sup>50</sup> NO<sub>x</sub> combines with VOC in the air in the presence of sunlight to form ground-level ozone. Therefore, reducing NO<sub>x</sub> emissions can help reduce ground-level ozone concentrations.

EPD has proposed a NO<sub>x</sub> motor vehicle emissions budget to EPA for the year 2004 that, if achieved, will contribute to attainment of the 1-hour ozone NAAQS. EPD's proposed NO<sub>x</sub> budget is 225 tons per day.<sup>51</sup> If EPA finds that this budget is appropriate, then future transportation plans, programs, and projects for the Atlanta nonattainment area will have to conform to it.

GRTA has chosen EPD's proposed NO<sub>x</sub> motor vehicle emissions budget of 225 tons per day, or less, as a target value by the year 2004.

49. On-road motor vehicle emissions are estimated rather than measured. This is because it is not feasible to record the emissions from every single vehicle in the Atlanta region, 24-hours a day. Briefly, the estimation is based upon: (1) the total mileage driven per day in the Atlanta region, which can be sampled and estimated using traffic counting devices or estimated using a travel demand model, and (2) the emissions generated per mile traveled, which is modeled with EPA's MOBILE model. Therefore, the accuracy of these measures depends upon the accuracy of the underlying data and models that support them.

50. A typical summer day refers to weather conditions that are typical of Atlanta during the summer months.

51. For comparison purposes, EPD estimated that total on-road motor vehicle NO<sub>x</sub> emissions were 304 tons per day in 1990.

### 2.2.2. AVERAGE DAILY MOTOR VEHICLE NO<sub>x</sub> EMISSIONS PER PERSON

This measure is calculated by dividing the total on-road motor vehicle NO<sub>x</sub> emissions per day by the total population in the 13-county nonattainment area. It is the average on-road motor vehicle NO<sub>x</sub> emissions generated per person during a typical summer day. Population estimates are based on census data and on ARC's population forecasts.

This measure tracks an individual's average share of NO<sub>x</sub> emissions from their use of motorized vehicles. The purpose of the measure is to establish a framework for outreach that informs the general public about the emissions implications of their personal transportation choices, and to set targets that they can strive to meet.

GRTA has developed a target for this measure of 54 grams of NO<sub>x</sub> per person per day<sup>52</sup> by the year 2004. This target is based upon EPD's proposed NO<sub>x</sub> motor vehicle emissions budget and on ARC's projection of the total population in the Atlanta nonattainment area in 2004.<sup>54</sup> If total NO<sub>x</sub> emissions are to be held constant or reduced after 2004, then the value of this measure will have to shrink below this target level after 2004 in order keep up with the expected population growth.

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52. This is equivalent to 43 pounds of NO<sub>x</sub> per person per year.

53. For comparison purposes, the value of this measure was 102 grams of NO<sub>x</sub> per person per day in 1990.

54. For comparison purposes, EPD estimated that total on-road motor vehicle VOC emissions were 402 tons per day in 1990.

55. This is equivalent to 21 pounds of VOC per person per year.

56. For comparison purposes, the value of this measure was 135 grams of VOC per person per day in 1990.

### 2.2.3. TOTAL DAILY MOTOR VEHICLE VOC EMISSIONS

This measure tracks the total amount of VOC emitted from on-road motor vehicles during a typical summer day. VOC combine with NO<sub>x</sub> in the presence of sunlight to form ground-level ozone. Therefore, reducing VOC emissions can help reduce ground-level ozone concentrations.

EPD has proposed a VOC motor vehicle emissions budget to EPA for the year 2004. EPD's proposed VOC budget is 106 tons per day.<sup>54</sup> If EPA finds that this budget is appropriate, then future transportation plans, programs, and projects for the Atlanta nonattainment area will have to conform to it.

GRTA has chosen EPD's proposed VOC motor vehicle emissions budget of 106 tons per day or less as a target value by the year 2004.

### 2.2.4. AVERAGE DAILY MOTOR VEHICLE VOC EMISSIONS PER PERSON

This measure is calculated by dividing the total on-road motor vehicle VOC emissions per day by the total population in the 13-county nonattainment area. It is the average on-road motor vehicle VOC emissions generated per person during a typical summer day. Population estimates are based on census data and on ARC's population forecasts.

This measure tracks the average contribution of individual travelers to the regional on-road motor vehicle VOC emissions total. The purpose of the measure is to establish a framework for public outreach that can help people become better informed about the emissions implications of their personal transportation choices, and to set targets that they can strive to meet.

GRTA has developed a target for this measure of 26 grams of VOC per person per day<sup>55</sup> by the year 2004. This target is based upon EPD's proposed VOC motor vehicle emissions budget and on ARC's projection of the total population in the Atlanta nonattainment area in 2004.<sup>56</sup> If total VOC emissions are to be held constant or reduced after 2004, then the value of this measure will have to shrink below this target level after 2004 in order keep up with the expected population growth.

The four emissions measures and their associated baseline and target levels are summarized in Table 6 on page 20.

Table 6. Emissions measures and targets

MEASURE	DESCRIPTION	1990 BASELINE	2004 TARGET
Total on-road motor vehicle NO <sub>x</sub> emissions per day	Total tons of NO <sub>x</sub> emitted from on-road motor vehicles during a typical summer	304 tpd*	225 tpd
Average on-road motor vehicle NO <sub>x</sub> emissions per person per day	Average grams of NO <sub>x</sub> emitted per person from on-road motor vehicles during a typical summer day	102 gpppd**	54 gpppd
Total on-road motor vehicle VOC emissions per day	Total tons of VOC emitted from on-road motor vehicles during a typical summer day	402 tpd	106 tpd
Average on-road motor vehicle VOC emissions per person per day	Average grams of VOC emitted per person from on-road motor vehicles during a typical summer day	135 gpppd	26 gpppd

\* tpd=tons per day

\*\* gpppd=grams per person per day

### 2.3. EMISSIONS SOURCES MEASURES AND TARGETS

These measures focus on the sources of emissions. The measures will provide data on the share of low emissions vehicles in public and private fleets and on the fraction of very dirty, or “super polluting,” vehicles on the road. This information could be useful for designing programs to accelerate the introduction of clean vehicles or speeding up the removal of “dirty” vehicles.

#### 2.3.1. SUPER-POLLUTERS

This measure tracks the percentage of vehicles that are super-polluters, observed on the road and registered in the Atlanta nonattainment area. Super-polluters are defined as those vehicles observed with tailpipe exhaust containing over 3.6 percent CO by volume.<sup>57</sup> The super-polluters measure is the ratio of the number of super-polluters observed to the total number of tested vehicles. For example, in 1998, the ratio was 3,788 observed super-polluters to 128,045 total vehicles tested—a super-polluter ratio of 3 percent. This measure is a proxy for the fraction of vehicles that pollute disproportionately due to their age, vehicle class, mechanical failures, insufficient maintenance, or other reasons. It is based on CO measurements because they are substantially more precise than VOC and NO<sub>x</sub> measurements, and it is assumed to be a general measure of the performance of the vehicles’ emissions control systems.

Although the percentage of super polluters is low and declining, their significance as polluters is much greater than their share of the fleet, since they emit at levels that are significantly higher than the average vehicle. Moreover, the super-polluters measure can be used to evaluate the effectiveness of the vehicle emissions check program i.e., the Inspection and Maintenance program (I/M) and other strategies that aim to reduce emissions from in-use vehicles.

Data from Georgia Institute of Technology’s Continuous Atlanta Fleet Evaluation program is used to track the super-polluters measure. The data have been collected from 1993 to present and are available for the years 1993 through 1998. Special sensors enable the unscheduled measurement of tailpipe emissions from vehicles while they are in operation. The advantage of in-use measurement is the ability to observe a vehicle’s emissions under typical driving conditions, which usually is not captured in the highly controlled conditions of emissions testing procedures.

57. The source of this definition is the Continuous Atlanta Fleet Evaluation Program.

The principal factors influencing emissions from super-polluters are vehicle age and inspection status. Recently, a committee of the National Research Council concluded that many state vehicle-emissions inspection programs should limit their focus to the highest-polluting vehicles, specifically older, malfunctioning ones.<sup>58</sup> According to the report, older and malfunctioning vehicles comprise a relatively small fraction of the nation's fleet but emit half of the pollutants. However, targeting only a select number of vehicles could raise equity issues, in that older, malfunctioning cars are likely to be disproportionately owned by low-income people. This is an area where GRTA, EPD, and other planning partners could create programs offering financial relief or other incentives to get the older or highly polluting vehicles repaired or replaced.

The super-polluter measure, depicted in Figure 7, displays a downward trend over the years 1993–1998. The observed baseline trend is from 4.9 percent in 1993 down to 3 percent in 1998. However, due to the inexplicable dip in 1996 and the lack of quantitative clarification for the observed trend, GTRA is not setting a target for this measure.

### 2.3.2. CLEAN FUEL VEHICLE PURCHASES

The CAA requires implementation of the clean fuel fleet program (CFFP) in serious ozone nonattainment areas like Atlanta, and it is administered by EPD. The CFFP requires owners/operators of fleets with ten or more “covered” vehicles in the nonattainment area to purchase clean-fuel vehicles for a fraction of their new vehicles. Clean-fuel vehicles are defined as vehicles that meet the low, ultra-low, or zero emission vehicle standards, which are significantly more stringent than the conventional vehicle/engine standards. The rule was initiated in 1994 and covers *vehicle purchases* of vehicles weighing up to 26,000 pounds.<sup>59</sup> Table 7 on the next page lists the percentage of clean-fuel vehicles that owners/operators of covered fleets must purchase each model year out of the total covered purchases.

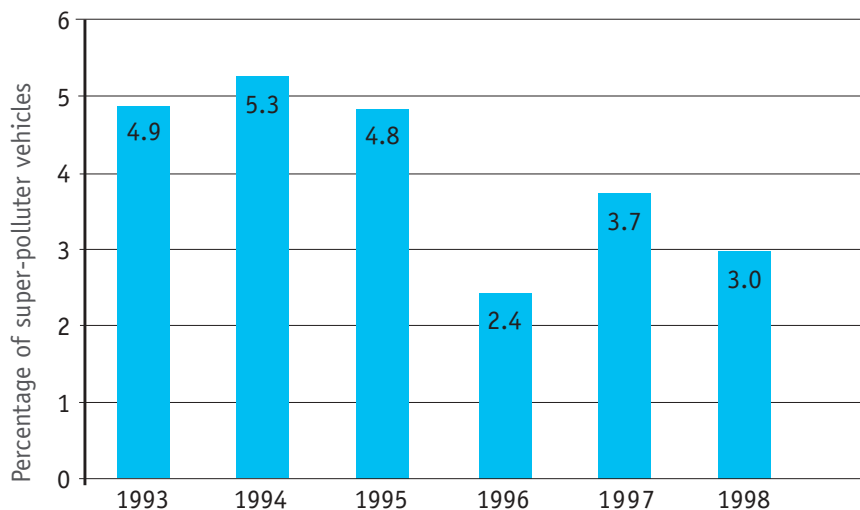
These percentages apply only to covered, new vehicle purchases in each model year. In order for a purchase to be “covered,” the vehicle must:

1. Weigh less than 26,001 lbs;
2. Operate in the nonattainment area;
3. Be centrally fueled or capable of being centrally fueled; and
4. Not fall into an exempt vehicle category.

The Atlanta nonattainment area has 1,357 fleets with 10 or more vehicles. Out of these, 469 fleets are covered by the CFFP with a total of approximately 20,000 covered vehicles.

Based on EPD's CFFP requirements, GRTA has developed a target of at least 70 percent of all new light duty vehicles purchases for covered fleets are to be clean-fueled. Likewise, at least 50 percent of all new heavy-duty vehicle purchases by covered fleets are to be clean-fuel vehicles. The target is set annually in model

Figure 7. Percentage of vehicles that are super-polluters, observed on the road and registered in the Atlanta nonattainment area (1993–1998)



57. The source of this definition is the Continuous Atlanta Fleet Evaluation Program.

58. AASHTO Journal, 2001.

59. Gross vehicle weight rating.

years 2001, 2002, 2003, and 2004. GRTA will review this target in 2003 for model years 2005 and beyond. Additionally, GRTA will provide base-line values for model years 1998, 1999, 2000, and 2001 for next year's report.

This measure could be expanded in the future to other vehicles beyond covered fleets, once a data collection program is in place and after EPD and GRTA develop a strategy to encourage purchase of clean fuel vehicles by the general public.

**Table 7. Fraction of new vehicle purchases required to be "Clean Fuel Vehicles" by covered fleet operators**

MODEL YEAR	LIGHT DUTY <sup>60</sup>	HEAVY DUTY <sup>61</sup>
1999	30%	50%
2000	50%	50%
2001 and thereafter	70%	50%

## 2.4. ACTIVITY MEASURES

Significant progress has been made in past decades to reduce the emissions per VMT, due to the increasingly stringent tailpipe emissions standards for automobiles. However, the decreases in emissions per mile traveled have, to a large extent, been offset by increases in VMT in the Atlanta nonattainment area. Therefore, GRTA has developed two measures that are designed to track the effects of VMT on emissions and air quality, and to provide information that may be used to evaluate strategies and control measures that influence VMT.<sup>62</sup> Providing increased transportation choices offered by public transportation could alter the trend of VMT growth. The third measure, Regional Transit Ridership, will track how successful the region is in attracting existing auto drivers and new residents to transit.

This group of measures could be expanded, if appropriate data programs are initiated, in the future to include other measures that more directly address the share of transportation activity by autos, transit, walking, etc. Furthermore, the VMT measures could include another dimension that focuses on detailed characteristics of motorized vehicles activity, such as, percent of VMT driving greater than 65 mph (high emitters), percent of VMT driving older vehicles, etc.

### 2.4.1. TOTAL DAILY VEHICLE MILES TRAVELED

This measure tracks the total daily summer-adjusted VMT in the Atlanta nonattainment area. The trend in total daily VMT for the Atlanta nonattainment area from 1986 to 2000 is depicted in Figure 8 on page 23.

VMT nearly doubled over the last 15 years from 67.6 million in 1986 to 121.6 million in 2000. This growth is the result of two factors: (1) population growth and (2) the increase in VMT per person per day. Over this period, the population in the nonattainment area grew by 54 percent from 2.4 to 3.7 million persons. The rest of the VMT growth is attributable to the growth in VMT per person per day.

### 2.4.2. DAILY VEHICLE MILES TRAVELED PER PERSON

This measure is computed as the total daily VMT divided by the total population for the Atlanta nonattainment area. The purpose of the measure is to establish a framework for public outreach that can better inform people about the air quality implications of their personal transportation choices.

The daily VMT per person for the period from 1986 to 2000, shown in Figure 9 on page 23, displays a general upward trend from the beginning of the period until 1998. After this year VMT per person declined from 35.5 miles in 1998 to 32.9 miles in 1999. It is too early to explain the underlying cause of this trend or to conclude that it is sustainable. However, it may be reinforced by expanding transportation choices, encouraging supportive land-use policies that provide improved spatial match between housing and employment, and improve access to amenities and essential services.

Figure 8. Total daily VMT for the Atlanta nonattainment area (1986–2000)

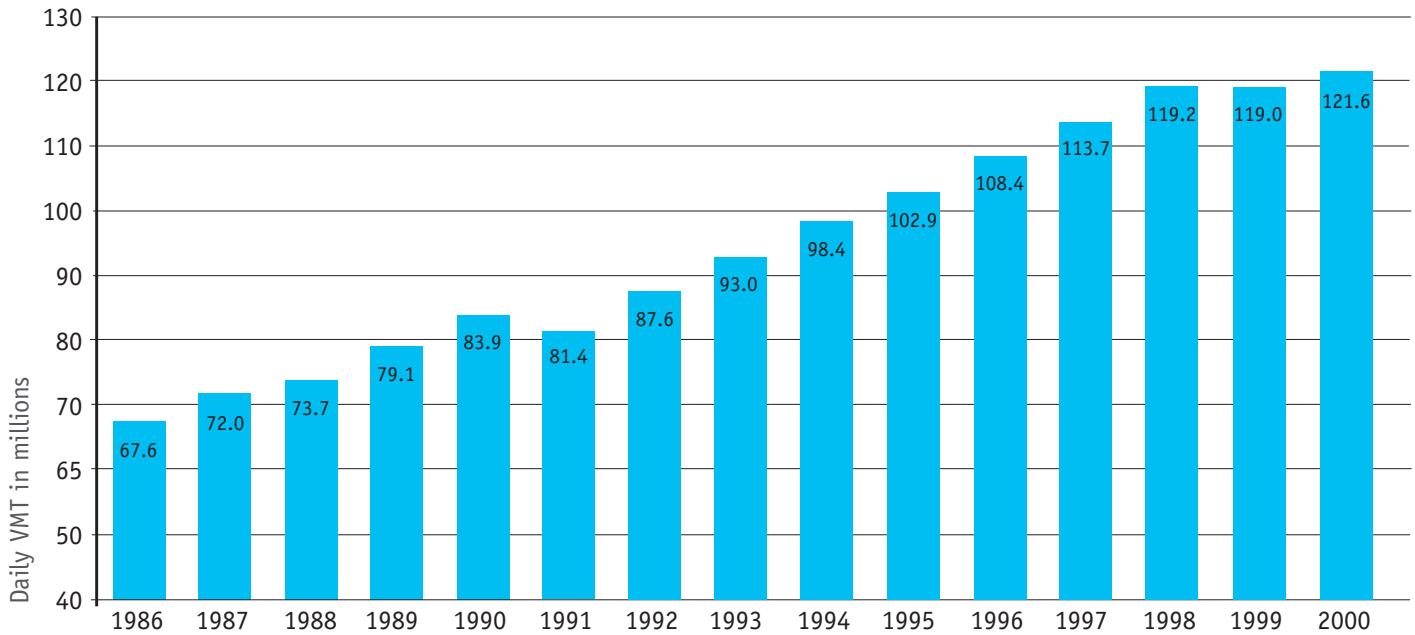
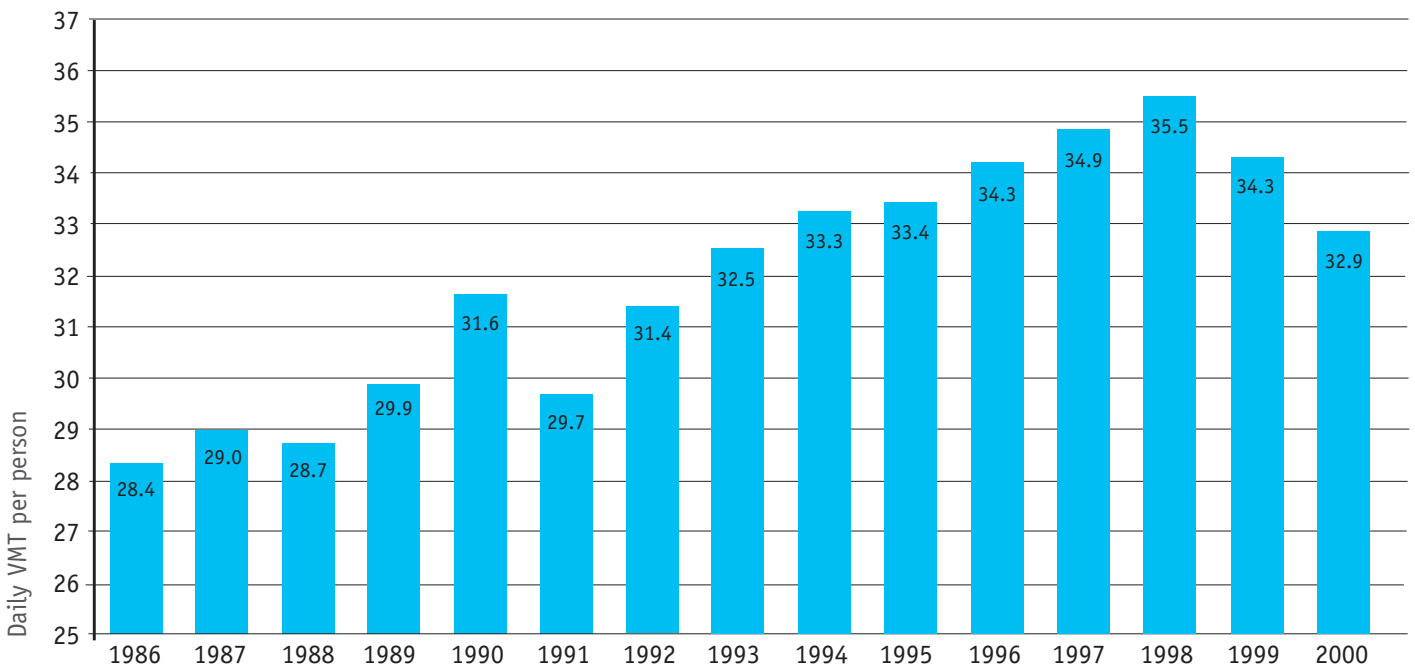


Figure 9. Daily VMT per person for the Atlanta nonattainment area (1986–2000)



### 2.4.3. REGIONAL TRANSIT RIDERSHIP

Currently, metro Atlanta’s transit system consists of two mature subsystems—the Metropolitan Atlanta Rapid Transit Authority (MARTA) and Cobb Community Transit (CCT). C-TRAN started operating in October 2001 with GRTA’s assistance. A fourth transit system, operating in Gwinnett County, started in November 2001.

The act creating MARTA was passed in March 1965. Six years later, MARTA became operational, serving Fulton and DeKalb counties and the city of Atlanta. Since then, MARTA has grown into one of the ten largest transit systems in the nation. Currently, it integrates fully rapid rail, fixed route bus, and paratransit services. MARTA has become a leader in forging partnerships with private enterprise in the creation of transit-oriented development adjacent to its rail stations. Moreover, MARTA has incorporated low-emission compressed natural gas fueled busses.

The implementation of CCT was authorized in June 1987. CCT began service in June 1989 with five local, fixed bus routes. Express service was

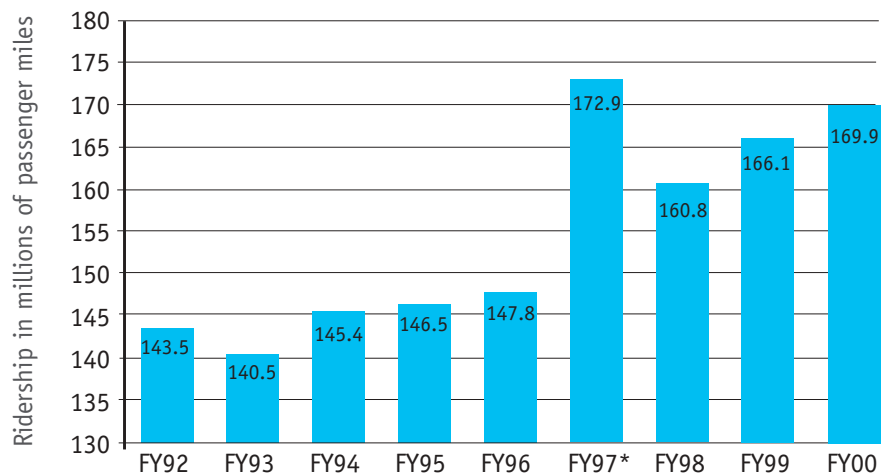
introduced in October 1989, and paratransit service began in June 1994. Currently, CCT operates eleven local routes, two express routes, and two reverse-commute routes. MARTA, CCT, C-TRAN, and the Gwinnett County transit systems enhance each other’s capabilities and will eventually form an integrated regional transit system.

The Regional Transit Ridership measure tracks the combined bus and rail usage of all the regional transit systems. Additionally, this measure may be used to estimate the VMT and emissions savings provided by transit. The Regional Transit Ridership measure is the cumulative sum of the distances ridden by all transit passengers annually in the Atlanta nonattainment area. Currently, the measure includes only the MARTA and CCT ridership. As the Clayton, Gwinnett, and other systems mature, their contributions will also be included. The importance of this measure to air quality is that by shifting motorized trips (and resulting emissions) from the region’s roadways to transit directly contributes to improving air quality. Indirectly, in the long run, a comprehensive transit system can support land-use

decisions that ultimately result in fewer trips, lower emissions, and better air quality.

The Regional Transit Ridership measure, plotted in Figure 10, below, displays an upward trend. Transit ridership increased by 26.4 million passenger miles from 1992 to 2000. This is an 18.4 percent increase. In other words, the historically observed trend is a 2.1 percent average annual increase over the last decade. This positive trend demonstrates the role of the well-developed transit infrastructure to increasing ridership. In addition, the peak transit ridership in fiscal year 1997, during the Olympic games in Atlanta, shows the importance of the well-orchestrated efforts of all the players in this process. GRTA will be a leader in the process of expanding the metro Atlanta transit system and its seamless integration into the whole transportation network through many of the transit programs included in the Governor’s Transportation Choices Initiative (described in Chapter 3) as well as in the outcome and implementation of projects to be identified by the Regional Transit Action Plan (RTAP).

Figure 10. Regional transit ridership in the Atlanta nonattainment area (1992–2000)





GRTA has developed eleven air-quality-related measures and one or more targets for seven measures.

## 2.5. SUMMARY OF MEASURES AND TARGETS

In summary, GRTA has developed eleven air-quality-related measures and one or more targets for seven measures. The measures and targets focus exclusively on transportation-related emissions and on ground-level ozone. However, GRTA is working with its planning partners to develop measures and targets for other emissions sources and other pollutants in the future. The current measures, targets, and associated baseline values are summarized in Table 8 on the next page.

Table 8. Summary of 2001 GRTA  
Air Quality Measures and Targets

NAME	DESCRIPTION	BASELINE		TARGET	
		VALUE	YEAR(S)	VALUE	YEAR(S)
Atlanta 1-Hour Ozone Standard Attainment Status	Number of 1-hour ozone standard exceedances per year averaged over a three year period	18.3	1998–2000	≤ 1.0	2004–2006
Ozone Days	Running three-year average of number of days during ozone season for which measured maximum 8-hour ozone concentrations fall into each of the five air quality index (AQI)-ozone sub-index levels (i.e., green, yellow, orange, red, and purple)	47.7	'98-'00	≥ 100 ≥ 130	'04-'06 '10-'12
		47.0	'98-'00	≤ 35 ≤ 23	'04-'06 '10-'12
		37.0	'98-'00	≤ 18 0	'04-'06 '10-'12
		16.7	'98-'00	0	'04-'06 '10-'12
		4.7	'98-'00	0	'04-'06 '10-'12
Total Daily Motor Vehicle Nitrogen Oxides (NO <sub>x</sub> ) Emissions	Total tons of NO <sub>x</sub> emitted from on-road motor vehicles during a typical summer day	304	1990	≤ 225	2004
Average Daily Motor Vehicle NO <sub>x</sub> Emissions Per Person	Average grams of NO <sub>x</sub> emitted per person from on-road motor vehicles during a typical summer day	102	1990	≤ 54	2004
Total Daily Motor Vehicle Volatile Organic Compounds (VOC) Emissions	Total tons of VOC emitted from on-road motor vehicles during a typical summer day	402	1990	≤ 106	2004
Average Daily Motor Vehicle VOC Emissions Per Person	Average grams of VOC emitted per person from on-road motor vehicles during a typical summer day	135	1990	≤ 26	2004
Super-Polluters	Percentage of vehicles that are super-polluters, observed on the road and registered in the nonattainment area	3.0	1998	N/A	N/A
Clean Fuel Vehicle Purchases	Percentage of all new vehicle purchases by covered fleets that are clean-fueled	N/A	N/A	70% light-duty; 50% heavy-duty	2001, 2002, 2003, 2004
Total Daily Vehicle Miles Traveled (VMT)	Total summer-adjusted VMT per day in the nonattainment area (in millions)	121.6	2000	N/A	N/A
Daily VMT Per Person	VMT per person per day in the nonattainment area	32.9	2000	N/A	N/A
Regional Transit Ridership	Cumulative sum of the distances ridden annually by all transit passengers in the nonattainment area (in millions of passenger miles)	169.9	FY 2000	N/A	N/A

Air Quality Measures

Source Measures

Activity Measures

### 3. AIR QUALITY RELATED INITIATIVES

**C**HAPTER 3 provides an overview of the leading air quality related initiatives under way in the Atlanta area and those that are being considered by GRTA, EPD, ARC, and others, for future implementation. The initiatives are classified into three broad areas of projects or programs that will benefit air quality. These areas are:

1. Fuel and vehicle initiatives
2. Land use initiatives, and
3. Transportation initiatives.

This listing provides a sampling of the principal ways that Atlanta's air quality problem is being, and could be, addressed.

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60. Light-dRVP is a measure of how quickly a fuel will evaporate. The higher the Reid vapor pressure, the faster the fuel evaporates.

61. Heavy-duty vehicles are defined as vehicles weighing more than 8,500 lbs, but less than 26,001 lbs. The upper limit of heavy-duty vehicles is currently set by the "covered vehicles" definition in EPD's rule.

62. The VMT data are provided by Georgia Department of Transportation. Summer-adjusted VMT, which is generally greater than the average annual daily traffic VMT, is employed to better reflect conditions during the ozone season.

63. RVP is a measure of how quickly a fuel will evaporate. The higher the Reid vapor pressure, the faster the fuel evaporates.

64. The counties covered will be: Banks, Barrow, Bartow, Butts, Carroll, Chattahoochee, Cherokee, Clarke, Clayton, Cobb, Coweta, Dawson, DeKalb, Douglas, Fayette, Floyd, Forsyth, Fulton, Gordon, Gwinnett, Hall, Haralson, Heard, Henry, Jackson, Jasper, Jones, Lamar, Lumpkin, Madison, Meriwether, Monroe, Morgan, Newton, Oconee, Paulding, Pickens, Pike, Polk, Putnam, Rockdale, Spalding, Troup, Upson, and Walton.

65. 66 *Federal Register* 63982.

#### 3.1. FUEL AND VEHICLE INITIATIVES

**F**uel and vehicle initiatives focus on three main ways to reduce pollutant emissions from motor vehicles:

1. Improve the formulation of the fuels they burn
2. Improve the emissions control systems of the motor vehicles (i.e., subject the vehicles to more stringent emissions standards), or
3. Improve the in-use performance of the vehicles' emissions control systems (i.e., emissions testing and repair programs).

##### 3.1.1. EXISTING FUEL AND VEHICLE INITIATIVES

Following is a description of five current programs that reduce motor vehicle emissions in the State through fuel and vehicle initiatives.

###### 3.1.1.1. Georgia Fuels Program

The Georgia Fuels Program was developed to reduce NO<sub>x</sub> and VOC emissions from gasoline-powered motor vehicles in and around the Atlanta nonattainment area. Emissions are reduced as a result of lowering the sulfur content and Reid vapor pressure<sup>63</sup> of conventional gasoline. Lowering the sulfur content improves the ability of the catalytic converter to convert pollutants—e.g., NO<sub>x</sub>—in the exhaust into more benign chemicals—e.g., nitrogen. Lowering the Reid vapor pressure reduces the rate at which VOCs evaporate from vehicles during the warm, ozone season months.

The sulfur content of gasoline sold in a 25-county area surrounding and including Atlanta has been regulated since 1999. Reid Vapor Pressure (RVP) has been regulated since 1995. In 2003, the sulfur content will be lowered further, and the area covered by the regulation will expand to 45 counties.<sup>64</sup>

Section 211 of the CAA pre-empts states from implementing fuel regulations that are not identical to those prescribed by EPA. Section 211(c)(4)(C) of the CAA, however, allows EPA to grant a pre-emption waiver if the state demonstrates that no other measures exist that would bring about timely attainment, or that other measures are unreasonable or impracticable. EPD has submitted an application for a pre-emption waiver for the RVP and sulfur specifications to EPA, and EPA has proposed approval of the waiver.<sup>65</sup>

###### 3.1.1.2. Atlanta's Inspection and Maintenance Program

Atlanta's I/M program is designed to reduce emissions from in-use vehicles. It requires vehicles to be tested annually to ensure that their emissions control systems are functioning properly. Owners of vehicles with malfunctioning emissions control systems must have their vehicles repaired. Vehicles subject to the program are all gasoline-powered passenger vehicles and light duty trucks weighing up to 8,500 pounds and registered in the Atlanta nonattainment area. Model years covered are those vehicles that are less than 25 model years old with the three newest model years exempt from testing. Vehicles that are ten years old or older, owned by senior citizens that are 65 years old or older and driven less than 5,000 miles per year are exempt from the emissions program. In 2002, the program will be augmented with new technology that should improve its effectiveness.

### 3.1.1.3. Clean Fuel Fleet Program

The CFFP is administered by EPD. The CAA Amendments of 1990 required nonattainment areas classified as Serious or above to implement the CFFP or an equivalent program. The CFFP requires fleets with more than ten covered vehicles to purchase clean fueled vehicles (CFVs). CFVs are defined as vehicles that meet the low, ultra-low, or zero emission vehicle standards. These standards are significantly less than the conventional vehicle/engine standards.

### 3.1.1.4. Low Emission Vehicle Certification Program

The Georgia legislature passed a bill in the 1998 session amending the tax code to provide a \$1,500 tax credit for the purchase of a dedicated alternative fuel low emission vehicle (LEV) registered in one of the 30 counties in or surrounding the Atlanta nonattainment area. The tax code was amended again in 2000, increasing the tax credit to \$2,500 for LEV and creating a \$2,500 tax credit for electric vehicle chargers purchased by businesses. In the 2001 legislative session, the tax code was amended yet again to create a category for zero emission vehicles and provided a tax credit of \$5,000 for these vehicles. The amendments also expanded the covered area of the program to include the entire state. The most recent amendments also allow fleets covered under the CFFP to claim the tax credits.

### 3.1.1.5. Atlanta Heavy Duty Vehicle and Equipment Inventory and Emissions Project

Heavy-duty vehicles and equipment, including highway and nonroad applications, emit significant amounts of PM<sub>2.5</sub> and the precursors that lead to ground-level ozone and PM<sub>2.5</sub> formation in the Atlanta area. Therefore, GRTA, in collaboration with EPD and GDOT, is conducting a study of the potential benefits and costs of reducing emissions from heavy-duty on-road vehicles and nonroad vehicles and equipment in the Atlanta area.

To assist in this study, GRTA will perform a detailed inventory of the heavy-duty on-road vehicles and non-road vehicles and equipment operating in the prospective 21-county Atlanta 8-hour ozone nonattainment area. The inventory will include the numbers, types, ages, and current and anticipated future levels of activity of the vehicles and equipment.

In addition, GRTA will utilize the inventory to develop a cost-benefit analysis (e.g., dollars per ton of emissions reduced) of controlling emissions from these sources in the Atlanta region. GRTA will use the results of this analysis to work with EPD to determine which emissions reductions strategies are cost-effective and feasible and should receive further consideration for implementation.

### 3.1.2. POTENTIAL FUEL AND VEHICLE INITIATIVES

Seven potential programs to reduce motor vehicle emissions in the State through fuel and vehicle initiatives are described below. These programs are currently being considered by GRTA, EPD, ARC, and other agencies.

#### 3.1.2.1. Diesel Retrofit of Transit and School Buses

EPA currently requires older<sup>66</sup> transit bus engines to meet PM standards for engines that are rebuilt after January 1, 1995. However, no requirements are currently in place to reduce the PM emissions of existing school buses or the NO<sub>x</sub> emissions for existing transit or school buses. Discussions have been initiated with EPD to focus on a retrofit project for school and transit buses. Since fueling and maintenance are normally centralized for bus fleets, it would be easier to apply and maintain emission controls and to use cleaner fuels, which are needed in order for many of the retrofit devices to work properly. Most of the emission control devices that have been verified by EPA only reduce PM emissions; however, manufacturers do have products being tested to reduce NO<sub>x</sub> as well.

MARTA has approximately 735 transit buses. Counting only the county school buses, there are 3,579 school buses within the 13-county nonattainment area. If half of the transit and school buses were retrofitted with devices and/or fuels to reduce NO<sub>x</sub> by 30 percent, and assuming the buses on average travel at least 20,000 miles per year, NO<sub>x</sub>

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66. 1993 and earlier

emissions could be reduced by over 200 tons/year. These are very conservative estimates. The bus population is actually much larger than the numbers included in this estimate. Due to a lack of data, the CCT buses, the city school buses, and the school buses in the other potential 8-hour nonattainment counties are not included in this estimate and their inclusion in such a program could significantly increase reductions.

### 3.1.2.2. Heavy Duty “Not to Exceed” Standards

Due to a series of events, significant backsliding is expected in the control of NO<sub>x</sub> emissions from on-highway, heavy-duty engines (HDE), resulting in excess emissions beginning in 2005. A national solution to this situation has been proposed by the state of California. It includes California’s adoption of strict heavy-duty not-to-exceed (NTE) emission standards and a critical number of states opting in to California NTE limits.

Some of the relevant facts surrounding this issue include the following:

- In late 1998, EPA entered into consent decrees with seven HDE manufacturers, found to be violating existing emission standards, to meet 2004 HDE emission standards beginning in late 2002, including compliance with NTE limits that reduce emissions not covered under standard engine certification protocols.
- In late July 2000, after a technology review of the 2004 HDE emission standards, EPA announced that they would delay these NTE limits until 2007.

- The seven HDE manufacturers under consent decree are seeking relief from the NTE limits. Failing judicial relief, they will certainly backslide off these NTE limits after the consent decrees expire in 2004 in order to remain competitive with other domestic and foreign manufacturers.
- Prior to 2007, backsliding will significantly increase NO<sub>x</sub> emissions from model year (MY) 2005 and MY 2006 HDEs in Georgia. In 2005, this increase is estimated to be 13 tons per day statewide and 8 tons per day in the 45-county Atlanta ozone control area; this will approximately double in 2006 when both MY2005 and MY2006 HDEs are in use.

The state of California is in the process of adopting its own state NTE limits and has invited other states to opt in to those limits via CAA section 177 petitions. A state opts in to the California NTE limits by adopting NTE regulations that reference the California standards and by then submitting them as a revision to the SIP. When EPA approves the SIP, the opt-in is approved. If a critical number of states (representing 40–50 percent of the HDE market) opt in to California NTE limits, the manufacturers are expected to standardize their production lines by making all engines comply with these California standards.

### 3.1.2.3. Low-Sulfur Diesel Fuel

The introduction of low-sulfur diesel fuel has been provided for at a national level to support the reduction of diesel PM and its associated health risks. Nationally, heavy-duty trucks and buses account for about one-third of NO<sub>x</sub> emissions and one-quarter of the PM emissions from mobile sources. In urban areas, the emissions contribution is often even greater. When fully implemented and combined with heavy-duty diesel engine controls phased in through 2010, the federal low-sulfur diesel program is expected to reduce PM and NO<sub>x</sub> emissions by 90 percent and 95 percent, respectively.

Unfortunately, the full benefits of the low-sulfur diesel fuel program cannot be realized in engines manufactured before 2007 without substantial engine modification and retrofit. The federal low-sulfur diesel fuel does not independently reduce NO<sub>x</sub> emissions and only reduces PM emissions by an estimated five percent.

As a result of the averaging, banking, and trading provisions included in the federal rule, some refineries are expected to produce limited quantities of the low-sulfur diesel in advance of the mid-2006 start date. Georgia may be in a position to take advantage of this early product delivery due to its location. In order to take advantage of any early supply, Georgia must overcome several limiting obstacles as noted below:

- Storage and distribution facilities must be able to accommodate the additional product line. With the low-RVP, low-sulfur gasoline product line that already exists in the northern third of Georgia, this may not be practical. As the national low-sulfur gasoline and

diesel fuels become widely available, the additional enhanced capacities previously needed to accommodate these “early” fuels have the potential to become excess capacity and “lost” investments.

- Strong market demand for the early low-sulfur diesel product line must be developed. Unless a large inventory of “retrofitted” pre-2007 engines can be developed in the early years, sufficient demand will not exist to recoup the medium-term infrastructure costs incurred to store and distribute the “early” fuel. Incentives may be required to spur infrastructure development. The same problem with infrastructure has been witnessed in the alternative fuels program here in Georgia.
- Without an inventory of “retrofitted” engines, the air quality benefits, which might be gained through the use of the low-sulfur diesel fuel, would not be realized. Development of this demand would also require either incentives-based programs or additional regulatory requirements.
- At the present time, the limiting factors for fostering air quality benefits through a widespread low-sulfur diesel fuel program appear to be the lack of regulatory and/or monetary incentives. As such, Georgia continues to seek smaller scale opportunities for voluntary initiatives through specific programs and fleets.

#### **3.1.2.4. Rules For Cleaner Heavy-Duty Trucks**

As discussed under the CFFP, 50 percent of trucks up to 26,000 lbs purchased by covered fleets must be CFVs. EPD does not have a regulatory or voluntary program for trucks purchased weighing greater than 26,000 lbs. EPD is currently reviewing the CFFP to determine if it would be feasible to eliminate the exemption and place a CFVs purchase requirement for trucks over 26,000 lbs.

Full implementation of the program is expected in ten years. However, in as little as one and half years, most engine manufacturers will be making engines that exceed the minimum CFVs standard in response to the EPA consent decrees. In 2004, the national standard for heavy-duty engines is reduced to the ultra-low emission standard. This means if the exemption were eliminated that EPD would be mandating fleets to buy CFVs when all heavy-duty vehicles will be cleaner than CFVs anyway. At best, emission benefits resulting from taking out the heavy-duty exemption may be realized for one model year and for any used heavy-duty vehicle purchases.

#### **3.1.2.5. Georgia and Nonroad Heavy-Duty Diesel Retrofit Program**

EPD is considering implementing a heavy-duty diesel retrofit program that will affect nonroad diesel vehicles in the nonattainment area. The goal would be to have this program in place by 2004. The result of the program would be a reduction in ozone, NO<sub>x</sub>, VOC, CO, PM, and air toxics. This program will initially be focused on nonroad construction equipment, but EPD is also looking at other nonroad diesel sources such as airport ground support equipment and locomotives.

EPD is in the planning stage of this program and, in conjunction with GRTA and GDOT, is gathering information on: existing types of heavy-duty equipment, the retrofits that are available and verified, and how to encourage participation in the program. EPD has requested that EPA help in implementing this program. In addition, EPD has plans to include major contractors and others who have a vested interest in this program.

The result of this program would lead into a Memoranda of Understanding with the parties that do the most construction contracting in Atlanta. As part of the memoranda, the partners will contract only with companies that either have or agree to install retrofits on their diesel equipment. EPD is also looking into a possible incentive program that would provide grant money for this program.

### 3.1.2.6. Accelerated Vehicle Retirement Programs

These programs have become of increasing interest to environmental policymakers in the United States over the past decade. Also known as vehicle scrappage and cash-for-clunkers, these initiatives help with the purchasing of older high emitting vehicles for a fixed amount of money and then permanently “retire” them by crushing them or disabling them and selling the remaining parts. The underlying goal of such programs is to remove high-emitting vehicles from the fleet and spur turnover to a newer fleet. While scrappage programs are ongoing in parts of California, most states investigating scrappage have only conducted pilot programs. The degree to which accelerated vehicle retirement (AVR) programs reduce fleet emissions is uncertain and depends on a range of assumptions, including the annual mileage of pre-scrapped vehicles, the amount of time scrapped vehicles would have been driven in the absence of a program, and replacement vehicle emissions and mileage. Depending on the purchase price, AVR programs may also drive up used vehicles prices and stimulate undesired imports of old vehicles into the program area. Nonetheless, scrappage programs may be a feasible mechanism for speeding fleet turnover and lowering overall fleet emissions. Currently, there is no funding source available to implement or operate such a program and the costs are anticipated to be substantial. AVR programs are typically periodic or cyclic in nature due to the associated costs and methods of funding.

### 3.1.2.7. Program to Promote Tax Credits for Purchase of Low Emitters in Georgia

As discussed in the LEV Certification section, Georgia has a tax credit program to provide incentives for purchasing or leasing dedicated alternative fueled low emission and zero emission vehicles. Suggestions have been made to extend this credit to “low emitters” such as hybrid electric vehicles. These vehicles may require incentives since they cost significantly more than comparable models. Incentives would increase the number of hybrid electric vehicles being purchased, which could decrease emissions of hydrocarbons between 70 percent and 90 percent, and NO<sub>x</sub> by 50 percent, when compared to conventional vehicles. Other benefits include the reduction of carbon dioxide, a greenhouse gas. Current statistics show that only 160 hybrid electric Honda Insights have been sold in Georgia since January 2000 in comparison to 12,039 Honda Civics sold in the same time period. One reason for the stark contrast in vehicle sales is that the Honda Insight costs over \$5,000 more than the comparable Honda Civic model.<sup>68</sup>

## 3.2. LAND USE INITIATIVES

Land use initiatives help to improve air quality by identifying and encouraging development that generates less VMT and emissions than is typical of recent trends in the Atlanta area. This may be done, for example, by concentrating development in areas that are well-served by the existing or planned regional transit system, and through design elements that encourage residents, employees and visitors to the development, to use modes other than the single-occupancy vehicle to travel to, from and within the development. In addition, GRTA, EPD, and other stakeholders, are exploring the feasibility of various strategies that could improve air quality by reducing the effect development can have on increasing air temperatures during the summertime.

### 3.2.1. EXISTING LAND USE INITIATIVES

Five current programs to improve air quality in the Atlanta area are described below.

#### 3.2.1.1. ARC/GRTA Joint Land Use Strategy

On June 14, 2000, the GRTA Board adopted the ARC/GRTA Joint Land Use Strategy. The purpose of the Land Use Strategy is to ensure land use policies represented in the RTP and Regional Development Plan (RDP) will guide future development in the Atlanta region to the fullest extent. The coordination of land use decisions with public investments in transportation is critical to the implementation of the RTP, and will continue to be critical to the future success

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67. EPD does not have any statistical information for the Toyota Prius.

68. Honda Insight with AC MSRP=\$20,620; Honda Civic LX with AC MSRP=\$15,520. Both vehicles have manual transmissions.

of the regional transportation planning process. GRTA will incorporate information developed through this process in its regional performance measurement system. The development of this monitoring system is under way.

This strategy document includes a number of land use activities, programs, and policies underway or planned for the ten-county ARC area. When the Atlanta region entered into a conformity lapse, planners, and to some extent policy makers, recognized that transportation solutions alone would not solve Atlanta’s air quality problems. The ARC then more fully integrated land use into the 2025 RTP. By including additional land use constraints on growth for the region, the RTP came into conformity. The Federal Highway Administration recognized the need for more land use constraints but needed assurance that these land use initiatives would be carried out. The Joint Land Use Strategy assigned some responsibilities of review and approval of ARC regional land use initiatives to GRTA. This document was essential in the federal government’s approval of the 2025 RTP. The major initiatives and responsibilities of the Joint Land Use Strategy are summarized in Table 9.

Table 9. Major initiatives and responsibilities of the Joint Land Use Strategy

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**Livable Centers Program**

ARC and GRTA will work cooperatively on project selection, especially to achieve air quality results. GRTA will facilitate project implementation.

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**Community Choices**

GRTA participates, as appropriate.

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**Developments of Regional Impact**

ARC process will be folded into the overall GRTA process for the nonattainment area.

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**Local Comprehensive Plan Certification**

GRTA reviews and comments on local plans. GRTA reviews will reflect the perspective of (1) the implementation of the RTP and Regional Development Plan and (2) the Governor’s Development Council direction.

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**Area Plan Review**

GRTA reviews and comments on area plans.

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**Performance Monitoring and Reporting on Development in Regional Development Plan Policy Areas**

ARC will monitor and report to the public. GRTA will review the documentation.

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**RDP/Comprehensive Plan Coordination Reports**

- ARC and GRTA will assist cooperating jurisdictions in seeking supplemental funding for corridor study processes
- ARC and GRTA will incorporate review of reports on comprehensive plan efforts and progress in corridor studies into priority setting for funds and into review of subsequent TIP amendments.

**3.2.1.2. Developments of Regional Impact**

As a part of GRTA’s enabling legislation, the legislature required that GRTA review DRI applications. The DRI process itself was authorized by the legislature in 1989 through the Georgia Planning Act. This Act allowed the Georgia Department of Community Affairs to develop a review procedure enabling jurisdictions affected by large projects, that lie outside of their boundaries, to have input on the approval process for such projects. In the case of large projects, it is common for the infrastructure impacts of the project to extend beyond the boundaries of the jurisdiction within which the project

resides. Coordination of the assessment of these impacts is at the heart of the DRI review process. The purpose of GRTA’s DRI review is to approve or disapprove the use of state and federal funds to create land transportation services for the impending development. The intent is to protect and more efficiently allocate limited state and federal resources; promote compliance with regional transportation plans and air quality standards; and further GRTA’s mission and goals. GRTA has developed guidelines for the preparation of DRI transportation impact studies. The studies will help GRTA make an informed decision as to whether it should approve or deny

the expenditure of state and federal transportation funds required to create land transportation services, or access to a DRI.

### **3.2.1.3. NASA Urban Air Quality Modeling Research Project**

GRTA, in partnership with EPD and EPA, is supporting a research effort by NASA to develop an Urban Air Quality Modeling System to quantify the impact of land cover and land use changes on Atlanta’s air quality. The research focuses on evaluating the potential for reducing urban air temperatures, i.e., the Urban Heat Island effect, in order to reduce ground-level ozone formation rates. In addition, GRTA and the Cool Communities Task Force will assist in formulating mitigation scenarios to be tested and will evaluate results for their potential to be implemented through policy changes and/or voluntary incentives. For example, the use of alternative building materials to increase reflectivity and planting additional trees are two examples of “cool communities” strategies that could be evaluated.

### **3.2.1.4. Strategies for Metropolitan Atlanta’s Regional Transportation and Air Quality**

Strategies for Metropolitan Atlanta’s Regional Transportation and Air Quality (SMARTRAQ) is a joint project among many entities. The Georgia Institute of Technology is spearheading this research project that will assess travel patterns, emissions, and physical activity as it relates to different land uses and identify barriers and incentives for local governments regarding land use. GRTA’s roles in this effort are to assist with the survey component, specifically to ensure the representation of the traditionally underserved and to assist in the development and maintenance of a parcel-level land use database for the thirteen county nonattainment area. This study has the potential to provide a great deal of information to planners and policy makers in the region regarding transportation, air quality, and land use.

The objectives of SMARTRAQ are to:

1. Assess how land use relates with travel choice, vehicle emissions, and physical activity;
2. Assist developers, lending institutions, and local government officials in their efforts to overcome barriers to implementing environmentally sound transportation and development solutions;
3. Identify, where possible, potential incentives that will encourage local governments to adopt land use strategies that support reduced vehicle emissions and congestion through the programming of transportation investments in designated centers and growth management policies; and
4. Estimate the relative impact of urban form and transportation investment on the overall level of household physical activity.

### **3.2.1.5. Atlantic Steel Redevelopment**

Jacoby Development Corporation, an Atlanta developer, has proposed a 12-million square foot redevelopment of the 138-acre former site of the Atlantic Steel mill near the north end of the I-75/I-85 Connector. The redevelopment will transform the site into a mix of residential, shopping and commercial uses—one of the largest urban redevelopment initiatives in the country. The redevelopment plan incorporates many design principles that promote pedestrian and transit access rather than exclusive reliance on cars. Also planned is a new 17th Street bridge that will cross over and provide access from the Interstate and connect the site to the nearby MARTA Arts Center station. The new bridge will be designed with dedicated lanes for vehicles, pedestrians, bicycles, and transit and may eventually carry MARTA rail lines.

The project is unique because EPA has approved the redevelopment and the 17th Street bridge together as a Transportation Control Measure (TCM) in the Georgia SIP.<sup>69</sup> A TCM is a measure taken for the purpose of reducing emissions or concentrations of air pollutants from transportation sources by reducing vehicle use or changing traffic patterns. It is the first TCM in the country to explicitly recognize the air pollution benefits of a well-designed development.

In addition, the Atlantic Steel TCM includes federally-enforceable monitoring and evaluation requirements, site design criteria, a commitment to provide transit, and performance targets that will help ensure that the project will achieve emissions reductions.

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69. EPA, 2000.

### 3.2.2. FUTURE LAND USE INITIATIVES

Two future land use initiatives that will be conducted by GRTA, ARC, and GDOT are described below.

#### 3.2.2.1. SMARTRAQ Land Use Information System

For selected areas and transit investment locations in the region, GRTA will modify the SMARTRAQ land use database to include attributes that should be considered within the context of land development. Features will include available ecological data, such as vegetative cover, topography, wetlands, and watershed delineation. Priority areas for data development and the selection of locations where this land use data will be added are based upon a set of criteria specified by GRTA, ARC, and GDOT.

GRTA will also review standards for the collection and coding of parcel-level attribute data at the local level. GRTA will review other regions in the nation that collect parcel-level data to identify successful approaches that have been undertaken and the responsibilities across agencies. GRTA will work with local governments to establish a permanent mechanism for updating the project land use information system. The completed parcel level land use database will be a valuable tool for understanding land use surrounding DRI locations.

#### 3.2.2.2. SMARTRAQ Livable Centers Initiative Analyses Program

Through the SMARTRAQ project, GRTA, ARC, and GDOT will jointly develop an evaluation tool that can be used in selection of priority capital projects in transportation programs resulting from the ARC Livable Centers Initiative's (LCI) annual \$1 million study program. Each LCI study will develop a program of local land use actions and programs with a prioritized list of associated transportation capital projects. It is anticipated that project selection will be based, in part, on the type of local policies recommended and the degree of local commitment to implementation of land use recommendations in each LCI study. Factors to consider include:

1. Level of transit ridership
2. Local congestion levels
3. Pedestrian counts
4. Increased land use mix
5. Access to transit
6. Low income commute time.

This tool may also be useful in the evaluation of DRI's.

### 3.3. TRANSPORTATION INITIATIVES

Transportation initiatives help to improve air quality by providing viable, attractive, less-polluting travel alternatives to the automobile. This may be done, for example, by providing an expanded and seamless regional transit system, and through flexible work schedules, so that employees can either avoid traveling during the rush hours or avoid taking a trip altogether by working from home.

#### 3.3.1. GOVERNOR'S TRANSPORTATION CHOICES INITIATIVE

On June 28, 2001, Governor Barnes announced the creation of the Governor's Transportation Choices Initiative. The five-year plan will provide funding for selected projects that are part of the approved 2020 RTP. The plan will help accelerate regional mobility and accessibility while protecting air quality by providing the citizens of Georgia with viable, cleaner transportation alternatives to the automobile. A brief description of the initiative is provided below.

##### 3.3.1.1. Regional Express Bus System

GRTA will implement regional express bus service that will serve the entire Atlanta nonattainment area, bringing people from the communities they live in to major employment and shopping centers.

##### 3.3.1.2. Express Commuter Bus

GRTA will implement express commuter bus service in the Athens, Canton, and Macon to Atlanta corridors.

### **3.3.1.3. Regional Vanpool Program**

To ensure that everyone in the region has access to job opportunities, GRTA will develop a regional vanpool program. With this program, GRTA anticipates serving people who need to travel at times outside of the traditional rush hours and in areas where an express bus service might not be the answer.

### **3.3.1.4. Regional HOV Network**

The regional express bus, commuter bus, and vanpool systems will take advantage of the HOV lanes and the major expansion in the system that will be taking place over the next several years.

### **3.3.1.5. Regional Commuter Rail System**

Over the next five years, GRTA will work with GDOT to implement the initial segment of a commuter rail system for the state that will serve the Macon-to-Atlanta corridor. In addition, GRTA will begin work on the Multi-Modal Passenger Terminal in Atlanta.

### **3.3.1.6. Northwest Corridor Connectivity**

GRTA will implement alternative transportation in the Town Center, Cumberland-Galleria, and Midtown Atlanta transportation corridor, with small circulator services at Town Center and Cumberland, and connecting to the MARTA rail system and local and regional bus services. The Northwest Connectivity Study will determine the alignment and transportation technology to be used. GRTA anticipates that this service will serve as a model for other transportation connections throughout the metropolitan Atlanta region.

### **3.3.1.7. Activity Center Circulator Systems**

A big challenge for any transportation system is to help get people to their destination—for example, from the transit station to the office or store—in an effective and efficient fashion. To address this challenge, GRTA will lead the effort to implement Activity Center Circulator Systems targeting major activity centers in the metropolitan Atlanta region. GRTA has already collaborated with the Buckhead Area Transportation Management Association on an electric shuttle that will serve the shopping centers, businesses, and MARTA stations in Buckhead. Other centers include Downtown and Midtown, Hartsfield Atlanta International Airport, Perimeter, Cumberland, and Town Center. Shuttle buses will link transit centers with the major employment and shopping centers in each area, thus making transit a more viable option to use to reach these activity centers.

### **3.3.1.8. Arterial Roadway Improvements**

GRTA will also implement improvements to alleviate congestion on arterial roads throughout the Atlanta region. Congestion and stop-and-go traffic increase emissions and restrict mobility, not only for automobiles but for public transit that use those roads as well.

## **3.3.2. OTHER EXISTING AND POTENTIAL TRANSPORTATION INITIATIVES**

Three other existing and future transportation initiatives are described below.

### **3.3.2.1. Educating Transit Operators of Compressed Natural Gas and Clean Diesel Technologies**

Often when new technology is introduced and implemented in the transit industry it is accompanied by fear and uncertainty among those employees who will operate the new equipment. Such was the case for CNG buses and the operators of those vehicles. The fear, for the most part, existed due to a lack of knowledge and understanding of the product. Natural gas was perceived as an element of nature that had to be treated with extreme caution and care. Union representatives of transit operators were often questioned by members concerning the safety of such a fuel element for the buses. The need for additional education and training became apparent from the onset. Transit Operator training for new operators incorporated an additional 10 to 15 hours of CNG and clean diesel training. This training included understanding the CNG concept and how it is used as a fuel for the buses. The training also included an extensive class on the safety of the CNG fuel and the safety components included in the bus to ensure the safety of the operators and the passengers they carried. Emergency procedures such as “danger indicators” and evacuations were also included in the training. This new fuel educational program has resulted in transit operators being more comfortable with the product.

### 3.3.2.2. Atlanta Regional Bicycle and Multi-Use Pathway Mapping Project

GRTA is working with the ARC on a Georgia regional geographical information systems mapping project titled the Atlanta Regional Bicycle and Multi-use Pathway Mapping Project. Currently, the Atlanta Region has a very limited network of bicycle and multi-use pathways linking the region's major activity centers, schools, transit stations, employment centers, and neighborhoods. The goal is to create a tool to assist in planning for intermodal linkages and to assist in planning for removal of gaps in the regional bike network. By consolidating local jurisdiction's bike and trail plans into a single geographical information system layer there will, for the first time, be a regional view of existing and planned shared-use facilities and a better understanding of the relationship of proposed DRI to non-motorized transportation options.

### 3.3.2.3. Partnership for a Smog-Free Georgia/Clean Air Campaign

The Partnership for a Smog-Free Georgia (PSG) promotes simple and effective voluntary actions that employers, employees and residents in the region can take to help improve air quality in the Atlanta area during the ozone season. The PSG focuses on collective and individual actions to reduce emissions from mobile and area sources. These include changes in vehicle volumes and traffic patterns through alternatives to single occupancy vehicle commuting, such as car pooling, van pooling, transit, teleworking, and participating in alternative work schedules.

EPD is the lead agency for the PSG program. Other participants include GDOT, the Regional Business Coalition, the Metro Atlanta Chamber of Commerce, and ARC. A representative from each of the organizations sits on the PSG Steering Committee and on the PSG Operating Committee. Georgia State University and the Southern Coalition for Advanced Transportation are under contract to assist with monitoring results from the PSG. The Georgia Institute of Technology helps EPD scientists forecast summertime ozone levels. The PSG focuses primarily on employers and secondarily on the general public. Employer "partners" officially sign up for the program, write smog reduction plans which they submit for review and filing, and monitor their activities and report the results to EPD. Employers are encouraged to develop season-long PSG programs

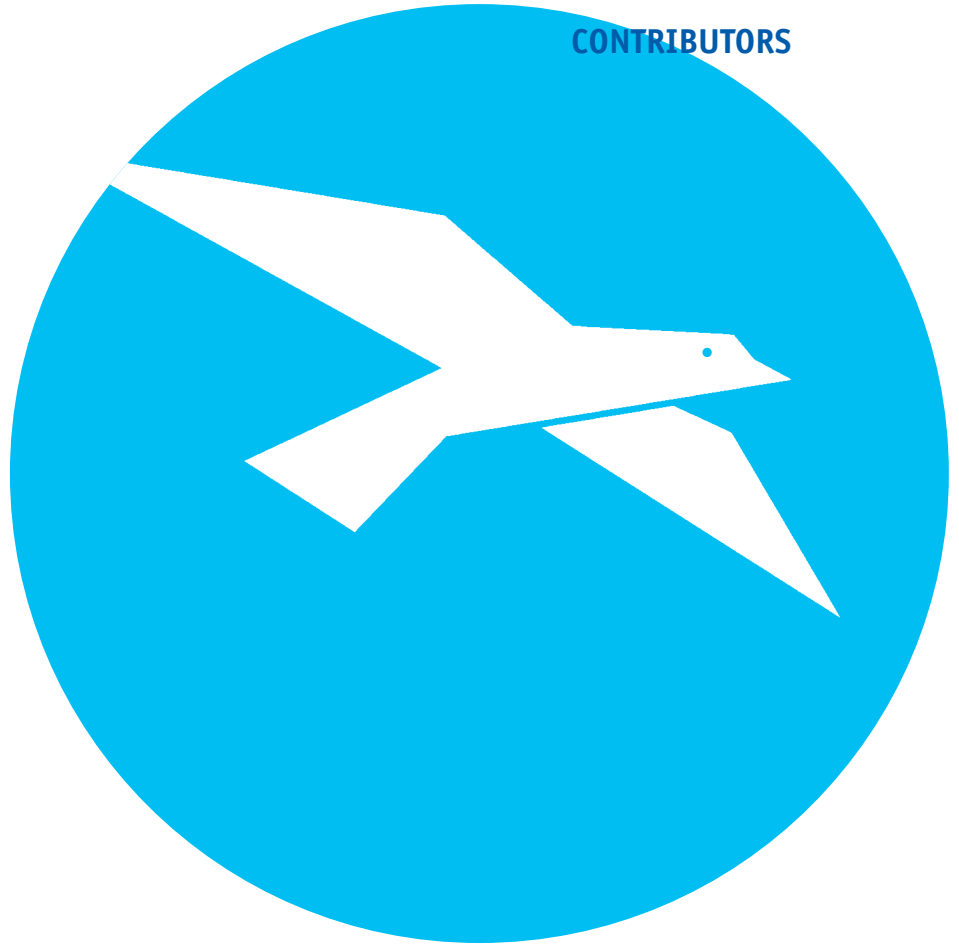
that promote alternative transportation for the entire season. During the ozone season, the PSG forecasts ozone levels for each day, and issues a Smog Alert Day on those days which are forecasted to have ozone levels which might exceed the 8-hour ozone standard. By way of fax, e-mail, highway signs, newspaper, radio and television, partners are notified and they, in turn, notify their employees.

In early 2001, the PSG agreed to a merger with the Clean Air Campaign (CAC), a consortium of more than 65 Atlanta-based companies, agencies and organizations. The CAC has conducted an education and outreach campaign targeting the general public with messaging about Atlanta's traffic congestion, air quality problems and the role of changing driving behaviors in solving these problems. Additionally, the CAC will leverage resources for mass media advertising and public relations, as well as, provide collaborative planning and coordinated program implementation for the reduction in single occupancy trips. This broad advertising and public relations campaign, which uses television, radio and print media for carrying messages to the general public in the entire north Georgia region, will increase participation in PSG. GRTA is on the Board of Directors for the CAC.

**ABBREVIATIONS**

**BIBLIOGRAPHY**

**CONTRIBUTORS**



## ABBREVIATIONS

AQI	Air Quality Index	ppb	Parts per billion
ARC	Atlanta Regional Commission	PM	Particulate Matter
AVR	Accelerated Vehicle Retirement	PM <sub>2.5</sub>	Fine Particulate Matter
C-TRAN	Clayton County Transit	PSG	Partnership for a Smog-Free Georgia
CAA	Clean Air Act	RTAP	Regional Transit Action Plan
CAAA	Clean Air Act Amendments	RDP	Regional Development Plan
CAC	Clean Air Campaign	RTP	Regional Transportation Plan
CCT	Cobb Community Transit	RVP	Reid Vapor Pressure
CFFP	Clean Fuel Fleet Program	SIP	State Implementation Plan
CFR	Code of Federal Regulations	VMT	Vehicle Miles Traveled
CFV	Clean-Fueled Vehicles	SMARTRAQ	Strategies for Metropolitan Atlanta's Regional Transportation and Air Quality
CNG	Compressed Natural Gas	TCM	Transportation Control Measure
CO	Carbon Monoxide	TIP	Transportation Improvement Program
DRI	Development of Regional Impacts	U.S. DOT	United States Department of Transportation
EPA	Environmental Protection Agency	VOC	Volatile Organic Compounds
EPD	Environmental Protection Division		
GDOT	Georgia Department of Transportation		
GRTA	Georgia Regional Transportation Authority		
HDE	Heavy-Duty Engine		
HOV	High Occupancy Vehicles		
I/M	Inspection and Maintenance		
LCI	Livable Centers Initiative		
LEV	Low Emission Vehicle		
MARTA	Metropolitan Atlanta Rapid Transit Authority		
MATI	Metro Atlanta Transportation Initiative		
µg/m <sup>3</sup>	Micrograms per cubic meter		
MY	Model Year		
NAAQS	National Ambient Air Quality Standards		
NO <sub>x</sub>	Nitrogen Oxides		
NTE	Not-To-Exceed		
OTAG	Ozone Transport Assessment Group		

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