

Air Quality Task Force Control Measure Recommendations **Implementation Plan Report**

Introduction

At its September 15, 2003 meeting, the Board of Commissioners received the Wake County Air Quality Task Force report and directed staff to prepare an implementation plan. This memorandum contains background and the most important points on the attached implementation plan for the Air Quality Task Force recommended control measures.

Background

Wake County grew by more than 200,000 people between 1990 and 2000, according to the U.S. Census Bureau, and by an additional 74,000 people between 2000 and 2003, according to Wake County Planning Department estimates. The Wake County Planning Department projects Wake County's growth to continue through 2010 by about 24,500 per year, or more than 67 people per day. While this growth offers opportunities, it also presents challenges to maintain the area's quality of life.

In response to these challenges, the Wake County Board of Commissioners has adopted an Environmental Stewardship Agenda that establishes goals and actions to maintain and improve air quality, water quality, open space, solid waste management, environmental health and safety and environmental education/environmental information. The Wake County Board of Commissioners has also worked with other local governments and stakeholders to prepare a countywide Growth Management Strategy, a Watershed Management Plan and a Consolidated Open Space Plan. The Wake County Board of Commissioners has initiated a comprehensive groundwater investigation and updated its Transportation Plan.

Because of the health effects of air pollution, especially ground level ozone, the Wake County Environmental Services Committee and the Human Services Board have established a goal of eliminating ozone action days in the Triangle by 2010. The Human Services Board created the Wake County Air Quality Task Force to prepare recommendations to achieve this goal, which the Task Force completed July 25, 2003. The Board of Commissioners received the report September 15, 2003.

The Air Quality Task Force recognized that EPA regulations would result in significant improvements to fuels and reduced emissions from new vehicles. Cleaner burning fuels and better engines will create fewer Nitrogen Oxides and Volatile Organic Compounds, which form ground level ozone. However, these reductions may prove to be insufficient to offset the emissions created as the number of vehicles and vehicle miles traveled per person in Wake County increase over time. Thus, local control measures to reduce vehicle miles traveled and emissions are needed to augment stricter fuel and vehicle standards. If added control measures are not implemented, poor air quality in the future and continued designation of Wake County and the Triangle area as a non-attainment area for the National Ambient Air Quality Standards could result.

Staff recommended action on the control measures recommended in the Air Quality Task Force Report:

The Air Quality Task Force recommended 43 control measures designed to improve air quality. The next step in this process is to further evaluate the Air Quality Task Force recommendations for action by the appropriate entities. The attached implementation plan identifies the following for each control measure:

- a) Costs,
- b) Ease of implementation,
- c) Expected benefits,
- d) Wake County staff recommendations on the control measures,
- e) Suggested the parties responsible for carrying out the measures
- f) The status of action on recommended control measures, and
- g) A time frame for implementing the measures.

The control measures are grouped into the following general categories:

- Control measures recommended by staff as a high priority that have already been implemented.
- Control measures recommended by staff as first priority work items.
- Control measures recommended by staff for Wake County and other organizations to implement. For instance, Wake County has joined the Triangle Clean Cities Coalition, and can encourage other local governments and businesses to join.
- Control measures recommended by staff that require a collaborative approach with other organizations. For instance, including air quality and energy conservation goals in land use and transportation planning will require coordination with other local governments.
- Control measures recommended by staff over which Wake County has little control. These are strategies that are best addressed through the transportation planning process or are applicable to specific organizations, such as RDU Airport or public transportation providers.
- Control measures that require further study before a recommendation can be made.
- Control measures that staff does not recommend because either they are already being handled effectively or they would not result in significant improvements to air quality.

In some cases, there are two parts to a control measure, and both parts may not both fit into one of the categories.

Control measures requiring further action by the Board of Commissioners

It should be noted that while Wake County has a role to play in implementing many of the control measures, only four of the control measures would require further direct action by the Board of Commissioners. They are:

1. Collaborating with other local governments, transportation entities and businesses to foster regional cooperation in an organized manner.
2. Implementing a commute trip reduction program in Wake County's jurisdiction.
3. Requiring bike and pedestrian facilities as part of the development approval process.
4. Developing a Memorandum of Agreement with the NC Department of Environment and Natural Resources Division of Air Quality.

As a general guide, the Implementation Plan includes a numerical ranking of the magnitude of costs, ease of implementation and expected benefits.

- The costs range from control measures that are already incorporated into a program and require no additional outlays (1) to control measures that require a major capital investment, such as HOV lanes (5).
- Ease of implementation ranges from control measures which are easy to complete (1) to those that require major changes to the physical environment such as the Triangle Transit Authority Regional Rail system (5).
- Expected benefits range from those with major changes in vehicle miles traveled and/or emissions (1) to those with marginal benefits (5). Some benefits are very concrete and easy to identify, such as emissions reductions from retrofitting diesel engines, while other benefits are less concrete, such as benefits from increased awareness of air quality programs.

In evaluating these control measures, staff used guidance from North Carolina Department of Environmental and Natural Resources Division of Air Quality staff, Air Quality Task Force members and EPA air quality experts. They recommend that the implementation plan focuses on measures that reduce vehicle miles traveled and improve the quality of emissions from motor vehicles, particularly heavy duty diesel engines, through use of cleaner fuels, vehicles with cleaner emissions and alternative fuel vehicles. Staff has used those criteria to rank the expected benefits of control measures.

Control measures recommended by staff as a high priority that have already been implemented:

#1 Support the Triangle Air Awareness Program. <http://daq.state.nc.us/airaware/>

This is a low-cost way to enhance the public's awareness of air quality: to inform them of how to protect themselves on ozone action days and what they can do to help improve air quality. Environmental Services has joined the Triangle Air Awareness Program.

#2 Support the Triangle Clean Cities Coalition. www.trianglecleancities.org This coalition is a source for information and grants for alternative fuels and alternative fuel vehicles. Alternative fuels generally result in less air pollution. Alternative fuels that are derived from crops, can provide markets for local agricultural crops and encourage the development of local refinement industries. Wake County Environmental and General Services Departments have joined the Triangle Clean Cities Coalition.

Control measures recommended by staff as first priority work items:

#3 Develop a formally constituted regional air quality agency to implement regional control measures throughout the Triangle (Air Quality Task Force recommendation.) The Air Quality Task Force recommended that this be an agency comprised of local governments, transportation entities and businesses. However, an agency implies regulatory power, which staff does not believe is necessary or appropriate and there are many forms in which to foster intergovernmental collaboration. Therefore, staff recommends that initial discussions be held among local governments, transportation entities and businesses to determine how best to collaborate regionally on air quality issues in an organized manner.

#4 Become a Best Workplace for Commuters. (www.commuterchoice.gov) This program can reduce vehicle miles traveled during peak hours and enhance employee recruitment potential. North Carolina employers that are Best Workplaces for Commuters include the EPA offices in RTP, Cisco Systems, Triangle Transit Authority, Durham County, GlaxoSmithKline, National Institute of Environmental Health Services, Research Triangle Foundation, the University of North Carolina at Chapel Hill and Mecklenburg County.

#5 Promote Ultra Low and Super Ultra Low Emission Vehicles. These are gasoline vehicles which run 77% to 95% cleaner than traditional vehicles. Purchasing ULEV and SULEV vehicles has no incremental cost and they are easy to identify. Staff also recommends that Wake County purchase hybrid vehicles and alternative fuel vehicles. Hybrid vehicles use gasoline motors and battery power. Manufacturers are planning to incorporate hybrid technology into a number of their models in model year 2004. Alternative fuel vehicles include primarily compressed natural gas and ethanol. The primary constraint to purchasing these vehicles is the cost of the fueling infrastructure. The State of NC will allow local governments to fuel at its sites, which include compressed natural gas and ethanol.

#6 Convert school bus fleets from diesel to Alternative Fuels. This control measure would reduce harmful emissions from diesel engines. This measure addresses the health effects of particulate matter by targeting a source that especially affects children. Wake County is currently pursuing grant funds in partnership with the Wake County Public School System to retrofit up to 150 of Wake County's 878 public school buses with pollution reduction mechanisms as a first step.

Control measures that are not recommended by staff for implementation:

#42 Encourage the public to check gas cap leaks and replace the cap if it is found leaking. Vehicles built since 1996 have On-Board Diagnostic Systems that detect leaks, including leaking or missing gas caps. Since an increasing number of cars will detect leaks and the expected emissions reductions are minimal, this strategy is not recommended.

#43 Implement a Cool Cities program. This program was initiated in Houston Texas, and is very similar to an urban heat island initiative, another control measure recommended by the Air Quality Task Force.

What is the Implementation Plan for the Air Quality Task Force recommended control measures?

The attached matrix outlines the Implementation Plan for the recommended control measures. Each of the control measures recommended by the Air Quality Task Force is listed by category, along with: cost of implementation, ease of implementation, expected benefits, the groups involved in implementing the strategies, a staff recommendation on what actions Wake County should or should not take to implement those strategies, and the current status of those efforts where applicable.

Glossary of Terms and Abbreviations used in Air Quality Task Force Implementation Plan:

Alternative fuels are substantially non-petroleum. The US Department of Energy currently recognizes the following as alternative fuels: methanol and denatured ethanol as alcohol fuels (alcohol mixtures that contain no less than 70% of the alcohol fuel), natural gas (compressed or liquefied), liquefied petroleum gas, hydrogen, coal-derived liquid fuels, fuels derived from biological materials, and electricity (including solar energy).

Biodiesel is a naturally oxygenated fuel produced from organic feed sources such as soybeans, cooking oil, and animal fats. Biodiesel can be used in its pure form (B100 or "neat") or blended at a 20% ratio with petroleum diesel (B20) to achieve cost efficiency and improve cold weather performance.

Cool Cities Program was started in Houston Texas as a control measure to comply with National Ambient Air Quality Standards. The existing tree canopy coverage of the region is used to calculate the economic and environmental benefits that trees provide in terms of pollution mitigation and cooling costs.

Environmental education/environmental information is a cooperative program of environmental educators in Wake County government. It is organized to further the

goals and objectives of the Board of Commissioners' Environmental Stewardship Agenda.

ENERGY STAR is an EPA-backed program helping businesses and individuals protect the environment through superior energy efficiency. It offers a proven energy management strategy that helps in measuring current energy performance, setting goals, tracking savings, and rewarding improvements.

Ethanol is a naturally oxygenated fuel produced by fermenting organic materials such as corn, grains, crop waste materials, and forestry waste materials. Ethanol is usually blended with gasoline at different levels. E10 is a premium high-octane gasoline for cars and E85 (85% ethanol 15% gasoline) is used as an alternative fuel for light-duty vehicles.

High-Occupancy Vehicle (HOV) lanes are designated along major thoroughfares. During designated times, only vehicles with the minimum number of people may travel in these lanes.

High-Occupancy Toll (HOT) lanes are designated along major thoroughfares. During designated times, vehicles with the minimum number of people may travel in these lanes free. Other vehicles may travel in them during those times, but they must pay a fee to do so.

LEED Standards or Leadership in Energy and Environmental Design Standards were created by the U.S. Green Buildings Council to encourage the creation of energy efficient, less costly, healthier buildings.

Metropolitan Planning Organizations are the vehicle for comprehensive, cooperative and coordinated transportation planning in metropolitan areas. In the Triangle, the Capital Area Metropolitan Planning Organization covers all of Wake County and the Durham-Chapel Hill Carrboro Metropolitan Planning Organization covers most of Durham and Orange Counties.

National Ambient Air Quality Standards (NAAQS) The Clean Air Act, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. The Clean Air Act establishes two types of quality standards. **Primary standards** set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. **Secondary standards** set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

The EPA Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" pollutants. They are listed below. Units of measure for the standards are parts per

million (ppm) by volume, milligrams per cubic meter of air (mg/m³), and micrograms per cubic meter of air (µg/m³).

National Ambient Air Quality Standards

POLLUTANT	STANDARD VALUE *		STANDARD TYPE
Carbon Monoxide (CO)			
8-hour Average	9 ppm	(10 mg/m ³)	Primary
1-hour Average	35 ppm	(40 mg/m ³)	Primary
Nitrogen Dioxide (NO₂)			
Annual Arithmetic Mean	0.053 ppm	(100 µg/m ³)	Primary & Secondary
Ozone (O₃)			
1-hour Average	0.12 ppm	(235 µg/m ³)	Primary & Secondary
8-hour Average	0.08 ppm	(157 µg/m ³)	Primary & Secondary
Lead (Pb)			
Quarterly Average	1.5 µg/m ³		Primary & Secondary
Particulate (PM 10) <i>Particles with diameters of 10 micrometers or less</i>			
Annual Arithmetic Mean	50 µg/m ³		Primary & Secondary
24-hour Average	150 µg/m ³		Primary & Secondary
Particulate (PM 2.5) <i>Particles with diameters of 2.5 micrometers or less</i>			
Annual Arithmetic Mean	15 µg/m ³		Primary & Secondary
24-hour Average	65 µg/m ³		Primary & Secondary
Sulfur Dioxide (SO₂)			
Annual Arithmetic Mean	0.030 ppm	(80 µg/m ³)	Primary
24-hour Average	0.14 ppm	(365 µg/m ³)	Primary
3-hour Average	0.50 ppm	(1300 µg/m ³)	Secondary

Nitrogen oxides or **NOx**, is the term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. Many of the nitrogen oxides are colorless and odorless. However, one common pollutant, nitrogen dioxide (NO₂) along with particles in the air can often be seen as a reddish-brown layer over many urban

areas. Nitrogen oxides form when fuel is burned at high temperatures, as in a combustion process. The primary sources of NOx are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels.

Particulate Matter and Fine Particulate Matter (aka PM 2.5) is a mixture of solid particles and liquid droplets suspended in ambient air. Some are directly emitted, others result from secondary formation as chemicals condense and combine in the atmosphere.

ULEV and SULEV Ultra Low Emission Vehicles and Super Ultra Low Emissions Vehicles are designations under California emissions standards for vehicles that burn fuel 77% to 95% cleaner than ordinary vehicles using current engine technology.

Volatile Organic Compound (VOC) is any compound of carbon that participates in atmospheric photochemical reactions. Excluded are carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate.

Abbreviations:

CNG Compressed Natural Gas

SOV Single-Occupant Vehicles, vehicles occupied by one person

VMT Vehicle Miles Traveled, the total number of miles driven by all vehicles