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COMMONWEALTH of VIRGINIA

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June 28, 2007

Mrs. Judith M. Katz
Director, Air Protection Division
US EPA Region III
1650 Arch Street (3AP00)
Philadelphia, PA 19103-2029

Dear Mrs. Katz:

The purpose of this letter is to formally transmit the June 30, 2007 status reports and supporting documents for the Early Action Compact areas of Roanoke and the Northern Shenandoah Valley to EPA Region III. This submission is in response to the requirements of the EAC program and EPA guidance on this subject.

These status reports clearly document the great amount of continuing effort and progress that has been made at both the local and state levels to meet all the commitments of the ozone early action plans for these areas. As a result of these plans, both areas are now in compliance with the 8-hour ozone standard.

Please contact me if you have any questions concerning these reports, and thank you again for your support throughout this successful air quality planning effort.

Sincerely,

Thomas R. Ballou, Director
Air Data Analysis and Planning

Enclosures

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Eighth Semi-Annual Status Report

for Roanoke Valley Area Ozone Early Action Compact Area

NOTE: U.S. EPA refers to the January-June, 2007 period as the 9th semi-annual progress reporting period in the Early Action Compact program.

January 1 – June 30, 2007

Roanoke Valley Alleghany Regional Commission

Part of newva

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PROJECT ORGANIZATION AND SUMMARY TO DATE

This report represents the 8th semi-annual status report for the Roanoke Valley Early Action Compact (EAC) area in Virginia. This area consists of the Cities of Roanoke and Salem, the Counties of Roanoke and Botetourt and the Town of Vinton. As such, this report documents the status and progress made towards the development and implementation of an Early Action Plan (EAP) to address ground level ozone pollution in the area. Specifically, this report covers the period from January 1 to June 30, 2007.

The EAC process in the Roanoke Valley area began in the fall of 2002, with the formal development and signing of the Early Action Compact in December 2002. A series of required documents have been produced, culminating in the submission of the official EAP in March 2004. Provided below is listing and timeline of the products and documents provided by the Roanoke Valley EAC effort:

December 12, 2002 – Early Action Compact for the Roanoke Valley Region
June 16, 2003 – Potential local control list submission
June 30, 2003 – 1st annual status report for January to June 2003
December 31, 2003 – 2nd annual status report for July to December 2003
March 31, 2004 – Completed local Early Action Plan submitted to DEQ & EPA
December 31, 2005 – State Implementation Plan

These documents, along with other information concerning the EAC program and other EAC areas, can be viewed and retrieved from the following EPA web site:

http://www.epa.gov/ttn/naaqs/ozone/eac/index.htm

Efforts on the state and local levels have now moved towards the implementation of the emissions control measures and other actions committed to in the EAP.

The remainder of this status report documents the major actions, milestones, and events that have occurred since the submission of the 7th Semi Annual Status Report for the Roanoke Valley Area Ozone Early Action Compact Area, July - December 2006.

EVENTS SUMMARY (January 1 to June 30, 2007)

Provided below is a listing of major events held, and actions taken, during the period covered by this status report. These developments contribute to the implementation of the local Ozone Air Quality Improvement Plan and associated nonattainment implications:

Events Summary:

- ***February 2007*** – Staff Distributed promotional brochures and items to the first in a series of global-warming related films shown at Hollins University, ***"Putting a Chill on Global Warming,"*** in conjunction with the Cool Cities Coalition.
- ***March 2007*** – Air Quality Program and RIDE Solutions recognized at final film for ***"Putting a Chill on Global Warming"*** film festival at Hollins University, sponsored by Roanoke Valley Cool Cities Coalition. Distributed promotional compact fluorescent bulbs and RIDE Solutions program materials to all of approximately 100 attendees.
- ***March 2007*** – Roanoke-Valley Alleghany Regional Commission open house and public meeting featured RIDE Solutions display and information, including sign-up sheet for Air Quality Action Days.
- ***April 12, 2007*** – Leadership Roanoke Valley (Roanoke Regional Chamber of Commerce) hosted a breakfast meeting titled "It IS Easy Being Green" with a panel discussion including Roanoke Valley Cool Cities Coalition, Roanoke Group of the Sierra Club, Roanoke Valley Chapter of Friends of the Blue Ridge Parkway, Virginia Tech Green Engineering Program and the City of Roanoke. Compact fluorescent light bulbs were distributed courtesy ofIDE Solutions and the Roanoke Valley Cool Cities Coalition.
- ***April 21, 2007*** – Annual Earth Day Celebration at Grandin Gardens.
- ***May 2007*** – RIDE Solutions distributed 200 compact fluorescent light bulbs as promotional effort to regional Household Hazardous Waste Day on May 6th.
- ***May 2007*** – RIDE Solutions Program Director attended Greater Roanoke Valley Asthma and Air Quality Coalition meeting to promote RIDE Solutions and Clean Commute Day.
- ***May 18, 2007*** – Clean Commute Day Event.
- ***June 12, 2007*** – Ozone EAP Stakeholder Meeting – RVARC Conference Room.

Publications, PR and Advertising:

- ***January 2007*** - Story on WDBJ-7 news on NRV Expansion of RIDESolutions.
- ***February 2007*** - Front page article on The Roanoke Times (circulation 98,000) "Commuters Save Money and Energy," featuring interviews with three RIDE Solutions members and mention of the program.
- ***January 2007*** - Story on WDBJ-7 news on NRV Expansion of RIDESolutions.
- ***April 2007*** – RIDE Solutions Director interviewed for "Roanoke County Today" on RVTV about RIDE Solutions and Clean Commute Day, segment to be broadcast from April 8th through the end of the month.
- ***April 2007*** – Press releases about Clean Commute Day and Bike Rack program sent out; op-ed piece written and submitted to The Roanoke Times for publication.
- ***April 2007*** – Launched Clean Commute Day website.
- ***May 2007*** – Accepted proclamation from the County of Roanoke declaring May 18 Clean Commute Day and the week of May 14 – 18 Bike to Work Week in the County.

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- ***May 2007*** – County of Roanoke began offering their own set of incentives to County employees to drive up Clean Commute Pledges.
- ***May 2007*** – Published Op-Ed in The Roanoke Times on Saturday, May 5th discussing the EAP and promoting Clean Commute Day.
- ***May 18, 2007*** – ***Clean Commute Day***
    - Total number of Clean Commute Pledges: 62; Of this total, 4 pledges were submitted from out-of-state, representing Anchorage, AK; Bellingham, WA; Pittsburg, PA; and Wylie, TX
    - Total event attendance: 60
    - Coverage in all major media outlets in the region
        - Op-Ed Published in The Roanoke Times (5/6/07)
        - Live broadcast on WDBJ 7 Mornin' (5/18/07)
        - Extensive evening news coverage on WSLS 10 (5/18/07)
        - Evening news coverage on WDBJ 7 (5/18/07)
        - Interview with Joe Zupan, WVTF Public Radio (5/18/07)
    - Pageviews of the website were 1,826 from the period of 5/5 - when the promotion essentially launched upon the publication of the Roanoke Times Op-ed - through 5/18 - and visits were at 637. An equivalent period from the month before saw 819 pageviews and 389 visits, meaning we doubled our web traffic.

IMPLEMENTATION STATUS OF EARLY ACTION CONTROL MEASURES

This section describes the status of each emission control measure included in the early action plan and the schedule for the measure's implementation.

Additional successes, which were not anticipated at the adoption of the plan, are highlighted in yellow. These represent steps above and beyond what is called for in the Ozone EAP.

Local Controls

Section I of III "Heavy Duty Diesel and Diesel Equipment Strategies"

1) Reduce Locomotive Idling, Implemented

The intention of this measure is to increase operating efficiency and reduce emissions from Transportation activities. Norfolk Southern Railway Company has implemented an operating policy to reduce emissions from idling locomotives as allowable by ambient conditions being greater than 32 degrees.

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Norfolk Southern Railway Company's contact for this measure is:
Gibson Barbee
Engineer Environmental Design
540-981-5185

Identify types of controls and enforcement:

Conservative Assumption *#1:* 2002 Base Year- NS has been working on idle reductions prior to 2005, such that benefits may have occurred earlier.

Conservative Assumption #2: 20 switching units operated in the five county Roanoke maintenance area that have a utilization rate of 55%. This number is further reduced by 20% for times the unit is not immediately switched off or ambient temperature is less then 32 degrees Fahrenheit.

The measure was implemented in Summer 2003.

Results Estimated from Conservative Assumptions #1 and #2 above:

55% utilization, 45% not utilized and therefore turned off and not idling.
[45% * (24 hours / day) * 365] = 3,942 hours not idling and turn off annually

[3,942 * (1-.2)] = 3,153.6 hours not idling including 20% safety factor per unit.

Each locomotive is therefore not idling an average of 3,154 hours annually. Assuming 20 units at 5 gallons diesel fuel per hour equates as follows (most burn closer to 6 gallons per hour such that again a safety factor is present):

3,153.6 hours * 5 gal/ hour * 20 units historically operated within the Valley = 315,360 gal diesel not combusted.

2) Limiting Idling Times for School Busses, Implemented

Local School Systems (City of Roanoke, City of Salem, County of Roanoke and County of Botetourt) have agreed to limit idling times for school busses through internal policy and management. This measure was implemented in Fall 2005 and is a continuous measure of the EAP.

3) Retrofit Roanoke County School Busses, Implemented

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Diesel engine retrofits were completed in June of 2005 (100 units total). Questions concerning the Roanoke County School Bus retrofit program can be directed to Danny Carrol at 540-387-6577.

Diesel engine retrofits for the City of Roanoke school busses, which began in 2004 have been completed. The entire City of Roanoke school bus fleet (140 school busses) have either been retrofitted (older busses) or purchased new with emission control equipment included. City of Roanoke School System participation in the diesel retrofit program was not anticipated in the original Ozone Early Action Plan (EAP), these 140 busses represent progress above and beyond the original EAP. For more information about City of Roanoke School System retrofit program please contact Ronnie Cassell at 540-853-2807.

4) City of Roanoke - Purchase of 5 Bio Diesel Compatible Solid Waste Trucks

In 2003 the City of Roanoke began purchasing bio diesel compatible solid waste trucks. From 2003 to this reporting period the City purchased five trucks. For the June – December 2006 period, two additional trash trucks were purchased. The implementation for this measure will be completed by 2007. In December 2006, the City began using B2 biodiesel. On May 1, 2007 the City began using B5 biodiesel. The B5 will be run for approximately 8-12 months so its use and impacts on fuel mileage, maintenance, repairs, etc. can be evaluated. After that time, consideration will be given to introducing higher blends of biodiesel; i.e., B10.

5) City of Roanoke – Purchase of Ethanol Compatible Vehicles

In 2003 the City of Roanoke purchased eleven sedans and station wagons that are ethanol compatible. During the June to December 2006, last reporting period, two additional flex fuel sedans were purchased. In the current fiscal year the City of Roanoke has purchased 9 flex fuel vehicles: Three Chevy Impalas, One Ford Ranger pickup, Three Dodge Caravans, One ChryslerVan, One Dodge Durango SUV. In the coming fiscal year, all 2008 Ford Crown Victorias will be flex fuel. The City of Roanoke plans to purchase 7-10 Crown Victorias and three Dodge Charger flex fuel units.

6) City of Roanoke – Purchase of 9 Bio Diesel Trucks

In 2003, City of Roanoke purchased nine new trucks that will operate using bio-diesel fuel. By 2007, City of Roanoke will purchase an additional twelve bio-diesel fuel compatible vehicles. No additional Bio Diesel Trucks were purchased during the last reporting period.

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Additional Success:
The City of Roanoke's entire diesel fleet is running their current B-5 Blend from mowers to large trucks. All new diesels that have come into the fleet have beening running this blend as well. Additionally, Roanoke City Schools has been using the City of Roanoke blend to fuel City School Busses. The City of Roanoke has several of our heavy diesel trucks that were purchased this year that have new 2007 emissions standards. These trucks have cleaner emissions and will all have emission particulate filters that trap emissions.

7) City of Roanoke – Purchase of 2 Hybrid Electric Vehicles, On Schedule

The City of Roanoke purchased 1 hybrid Ford Escape for evaluation in 2005. In the June to December 2006 reporting period, two additional hybrid Ford Escapes were purchased. By the end of the January to July 2007 reporting period one additional hybrid For Escape will be delivered bringing the City of Roanoke's total purchase to 4 hybrids.

8) County of Roanoke – Purchase of Low Emission Vehicles, Implemented

The County of Roanoke purchased **5 (five) hybrid electric vehicles**: 2 Honda Civic, 1 Toyota Prius, and 2 Ford Escape Hybrids in 2005. Future purchases are projected to follow prior to 2007. Two additional Ford Escape Hybrids were purchased during the June to December 2006 reporting period, bringing the total hybrids in the county fleet to 7 hybrid vehicles.

9) County of Roanoke – Fleet Management Education and Training, Implemented

The County of Roanoke has completed this strategy, which resulted in the production of a training video so that new hires could be trained on the County's fleet management policy regarding Air Quality. Approximately 300 individuals have received the training as of June 2007. This is a continuing measure of the EAP.

Additional Success – Staff Training/ Air Quality Video
The resulting Staff Training/ Air Quality Video is also useful as a public education tool. As such, the video has been played extensively on the local public access

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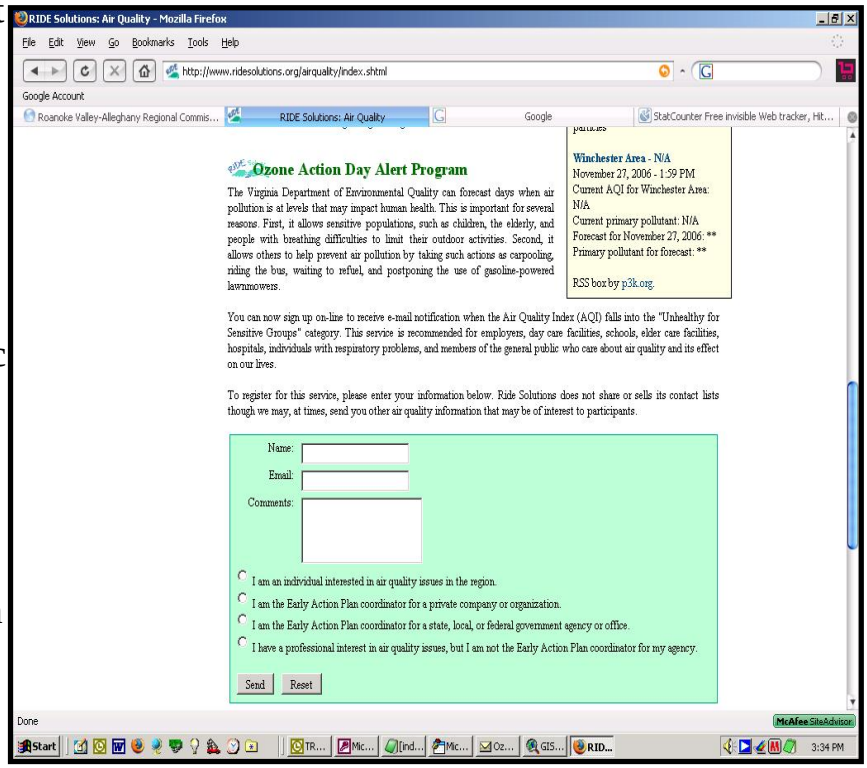
channel RVTV 3. This tool supplements the general public education components of the Ozone EAP.

Section II of III "Air Quality Action Day, Public Education and Stationary Sources Strategies."

10) Air Quality Action Day, On Schedule



Fortunately, there has not been an Air Quality Action Day since the development of this strategy in early 2004. Nonetheless, the initial contact database has grown to over 350 first line contacts in the public and private sectors. These contacts are responsible for forwarding the message within their organizations. Here is an image of the web page where individuals and businesses can register to be on the Ozone Alert Listserv. The Air Quality Index (AQI) is reported to participating organizations when the AQI is forecasted to reach unhealthy levels.
The Air Quality Action Day website was recently revised and is pictured above.

The RIDE Solutions (RS) Program of the Roanoke Valley-Alleghany Regional Commission is charged with managing the Air Quality Action Day program. Organizations and citizens can enroll for the Action Day notification list from the RIDE Solutions homepage, or by calling the RIDE Solutions office. In addition, the following media organizations have agreed to report Air Quality Action Days during their local programming:

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WBDJ 7 (CBS)
K92 (Radio)
WSLS 10 (NBC)
Adelphia (Cable)
RVTV (Local Access)
Cox (Cable)
WVTF (Radio)
WFIR (Radio)
VIBE100 (Radio)
Roanoke Civic Center (Marquee Variable Message Sign)
Roanoke Times (Newspaper)
Clear Channel (Radio System)
Local on the 8s (Weather Channel)
National Public Radio

RIDE Solutions has also added an additional feature to its services to lower Single Occupancy Vehicle) SOV drivers in the region. Commuters who are looking for more temporary or one trip carpool matches can now use the RIDE Solutions bulletin board for carpool matching. It encourages citizens to actively seek out ways in which they can reduce traffic and air pollutions. This forum also provides individuals with more flexibility in their mobility. The RIDE Solutions bulletin board can be viewed at:

http://rvarc.myfreeforum.org/forum2.php&sid=c3d45a73bd578d4dddbef949286d66cc.

Or it can be accessed from the Regional Commission's homepage at http://www.rvarc.org. Ride Solutions currently has over 300 members participating in the alternative transportation program.

The Ozone Early Action Plan also has an official website (www.rvarc.org/work/eap.htm.) The Air Quality Action Day program is the lynchpin of the public involvement component in the Ozone EAP.

11) Early Morning or Late Evening Refueling, Implemented

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All local governments have agreed to, and implemented, this program. Some local governments, such as the City of Salem, have even turned off their fuel pumps during daytime hours from May to October. Many private sector organizations have also voluntarily agreed not to refuel their vehicles between 8:30 and 4:30 pm during the Ozone season. The Commonwealth has also agreed to close pumps on predicted ozone action days. Private sector participants include:

Goodwill Industries	Addecco Staffing
Salem Avalanche	Workforce Staffing
Workman Oil	Echostar
COX Communications	RADAR
Roanoke Times	Spee-Dee Oil Change
Southern Soft Cloth Auto Wash	Roanoke/Botetourt Fitness Club
Liberty Cab	Roanoke Downtown Sports Club
Yellow Cab	Cardinal Bicycles
Valley Metro	Peddlers Bicycles
Blue Ridge Home and Garden Magazine	East Coasters
Blue Ridge Outdoors	Air-Lee Dry Cleaners
Hooptie Ride Limousine Service	Safe Kids Coalition
Breathe Roanoke Asthma Coalition	Roanoke Biz2Biz
Wachovia Regional Headquarters	

12) Promotion of Alternative Fuel Vehicles, Implemented

This strategy is designed to encourage citizens to consider air quality when purchasing a new vehicle. Staff has chosen not to promote one brand or make of vehicle over another. In background research for this strategy, staff discovered that hybrid electric vehicles were in fairly high demand; indicating that fuel economy and/or environmental concerns are present in some consumer's purchasing behavior. The website for the promotion of alternative vehicles has recently been revised see above.

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13) Media and Public Relations Concerning Air Quality Action Days, Implemented and a continuing measure of the EAP

This strategy is the direct complement of strategy #10. Various local media outlets have agreed to alert the public on Air Quality Action Days. As of June 2005 the following media outlets are participating in the program:

WBDJ 7 (CBS)
K92 (Radio)
WSLS 10 (NBC)
Adelphia (Cable)
RVTV (Local Access)
Cox (Cable)
WVTF (Radio)
WFIR (Radio)
VIBE100 (Radio)
Roanoke Civic Center (Marquee Variable Message Sign)
Roanoke Times (Newspaper)
Clear Channel (Radio System)
Local on the 8s (Weather Channel)

14) Public Transit Incentives, Implemented

Valley Metro - Valley Metro's Operations, Maintenance, and Administrative facility is located at 1108 Campbell Avenue SE. The Campbell Court Transportation Center is located in the heart of downtown Roanoke at 17 Campbell Avenue SW, and is a modern intermodal facility which provides connections between Valley Metro, The Smart Way, the Ferrum Express (weekend college service) and Greyhound. Valley Metro runs 16 routes in Roanoke, Salem, and Vinton. Valley Metro can be contacted by the public at (540) 982-2222, with a live operator available between the hours of 5:45am and 8:15pm, Monday through Saturday. The office number is (540) 982-0305 and office hours are Monday through Friday, 7:30am to 4:30pm.

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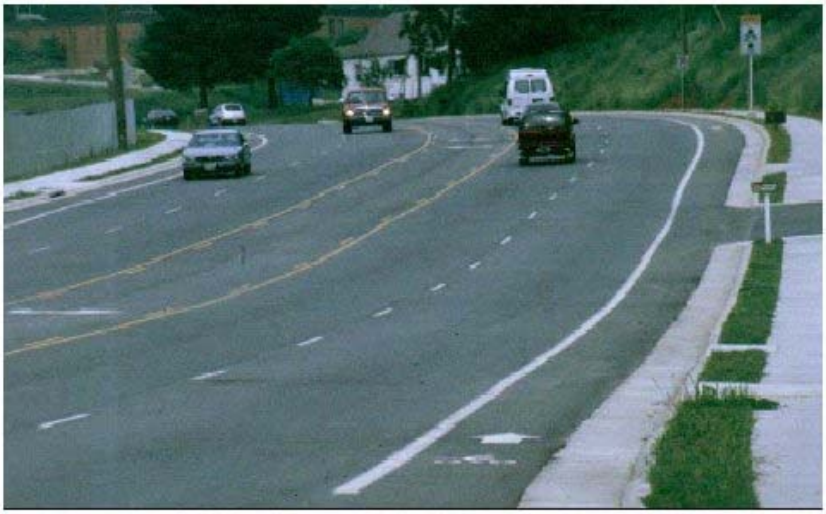
In 2005 Valley Metro and RIDE Solution distributed over 300 free bus passes throughout the region to encourage transit ridership and alternative transportation.

Additional Success - Valley Metro Summer Youth Pass

The Greater Roanoke Transit System (Valley Metro or VM) is continuing a $20 Summer Youth Pass that began in the summer of 2005. This pass allows youth, who are enrolled in school during the regular school year; unlimited fixed transit rides during the summer break. The motivation for this pass is to allow working age youth to find summer employment without having to rely on a private vehicle. The program seeks to encourage the development of a familiarity with public transportation that could carry over into adult hood. In the summer of 2005 Valley Metro sold 218 summer youth passes. In the summer of 2006 Valley Metro sold 143 youth passes. In the summer of 2007 Valley Metro entered into an agreement with Roanoke City School System to allow all Roanoke City High School Students to ride the bus in the summer by showing their school I.D.

15) Bicycle Infrastructure and Amenities, On Schedule



Bike lane along Hardy Road in the Town of Vinton.

The *Bikeway Plan for the Roanoke Valley Area MPO* was developed with input from local governments and interested citizens. The *Bikeway Plan for the Roanoke Valley Area MPO* was adopted by the Roanoke Valley Area Metropolitan Planning Organization in August 2005 and replaces the 1997 *Bikeway Plan for the Roanoke Valley*. The plan implementation began in 2005 and will continue through 2007.

The *Bikeway Plan for the Roanoke Valley Area MPO* represents a coordinated effort by the Roanoke Valley Area MPO and local jurisdictions to facilitate development of a regional transportation network that accommodates and

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encourages bicycling as an alternative mode of travel and as a popular form of recreation in the MPO study area.

The *Bikeway Plan for the Roanoke Valley Area MPO* provides a coordinated and strategic approach to the development of a regional bicycling network that provides greater connectivity between activity centers and cultural resources such as greenways, public areas, downtown areas, commercial centers, employment concentrations, educational institutions, transit facilities, scenic corridors, and other points of interest in the MPO study area. The regional network outlined in this plan will also facilitate inter-jurisdictional connectivity between localities.

The Bikeway Plan should also facilitate the long-range transportation planning process, the Ozone Early Action Plan and the allocation of limited funding for bicycle and pedestrian improvements. This plan should be used in concert with local, regional, state, and national plans and/or policies including the VDOT Policy for Integrating Bicycle and Pedestrian Accommodations and the VTrans2025 Statewide Bicycle and Pedestrian Plan, as well as continued public involvement in the transportation planning process.

In an attempt to promote the Bikeway Plan, staff has provided the Roanoke County Board of Supervisors and the Vinton Town Council with a presentation overview of the plan and an outline for future implementation. Additional outreach materials, the Bikeway Plan and other information can be found at the Roanoke Valley-Alleghany Regional Commission's Bicycle and Pedestrian Planning web-site www.rvarc.org/bike.

Additional Success – Regional Greenway Master Plan Update:

RVARC Staff partnered with the Roanoke Valley Greenways Commission to secure funding from a Virginia Department of Transportation Pilot Program to develop an update to the Conceptual Greenway Plan for the Roanoke Valley (adopted in 1995). This update is focusing on implementation and will contain both an implementation and funding strategy. In fact, Novozimes Biologicals Inc. recently announced a $250,000 (over 5 years) contribution to greenway completion.

16) School Based Public Education, Implemented/ Ongoing

RIDE Solutions provides K-12 education classes with the intention of fostering air quality awareness in youth. This program is in correspondence to the Standards of

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Learning (SOL) Life Sciences Section LS.12 that states that, "The student will investigate and understand the relationship between ecosystem dynamics and human activity. Key concepts include environmental issues such as air quality." In this K-12 education program, RIDE Solutions educates the students about their affects on the environment and what they can do to help improve air quality. Specifically, RIDE Solutions staff would speak on the key concepts of:

a) environmental issues of water supply, air quality, energy production and waste management;
b) food production and harvest;
c) change in habitat size, quality, or structure;
d) change in species competition; and
e) population disturbances and factors that threaten or enhance species survival.

17) Tree Canopy/ Urban Forestry, On Schedule

This strategy is on schedule and enjoying increased popularity. A summary of recent urban forestry activity follows:

- City of Roanoke: on schedule according to "City Urban Forestry Plan" and planted 300 trees as a part of a reforestation effort for the June to December 2006 reporting period.
- Town of Vinton: planted 5 trees from July to December 2006.
- County of Roanoke: on schedule to plant 100 trees this year.
- Friends of the Blue Ridge Parkway are also planting trees along the parkway in the region. The number of trees planted during this reporting period has yet to be determined.

18) Roanoke to Blacksburg Public Transit, Implemented

The Smart Way service between Roanoke and Blacksburg has been successfully implemented and will remain in continuing measure of the EAP and service to the region's citizens. The transit line makes 12 runs a day, 10 runs Saturday, between the Roanoke and New River Valleys. The fare is $3.00. Ridership statistics for the past two months are summarized below: (note June 2006 is only a partial count.)

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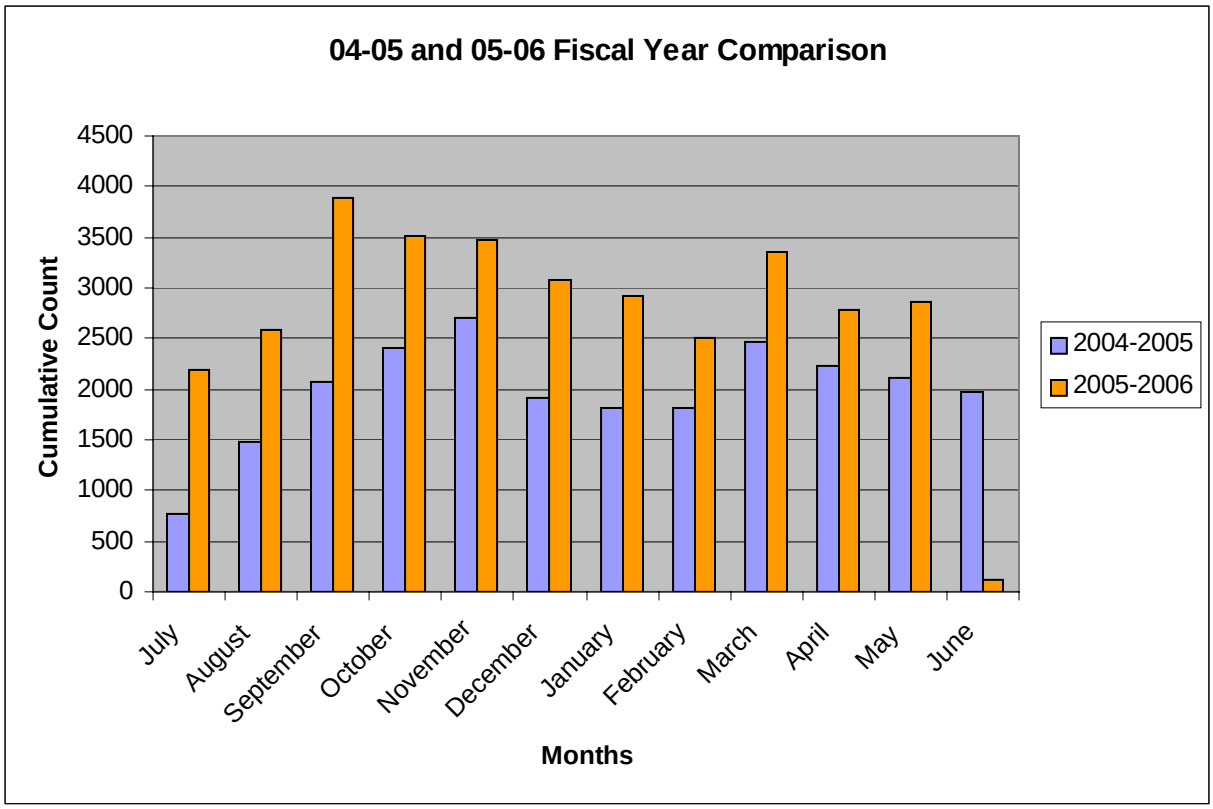

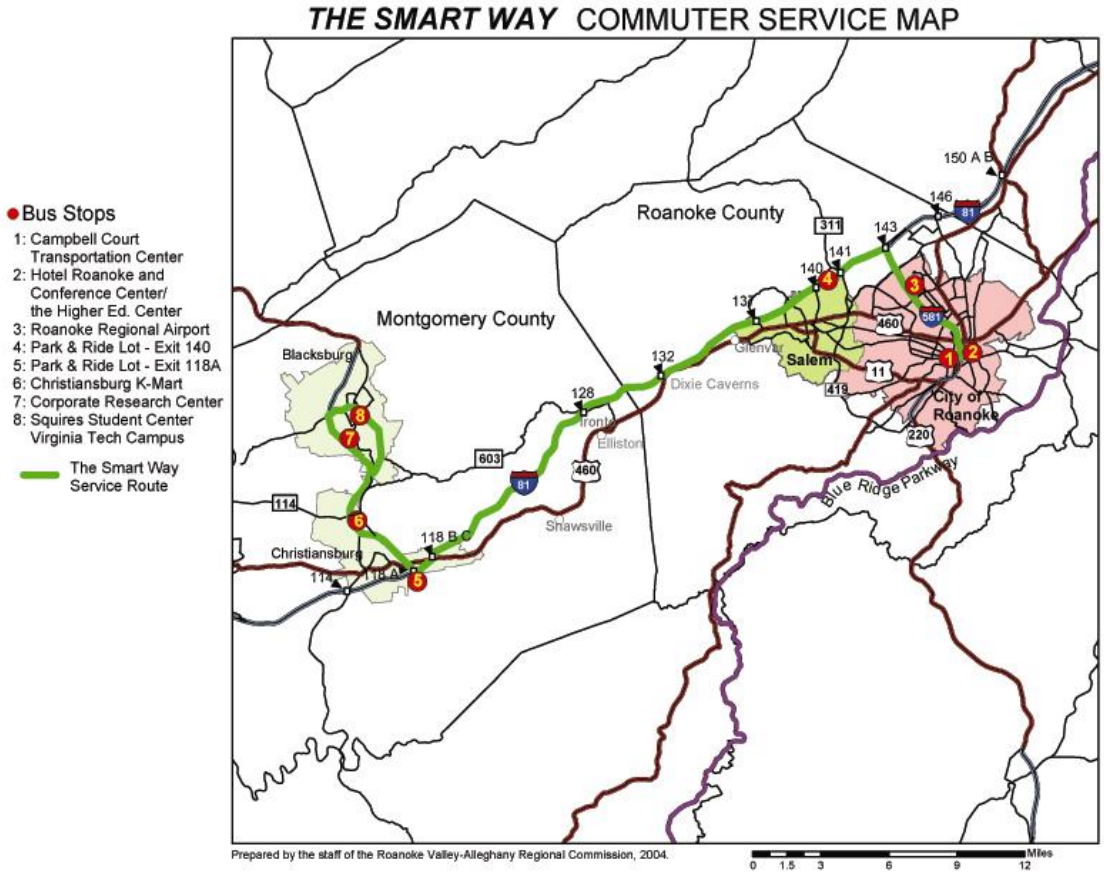

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The most recent ridership numbers for the Smart Way bus are as follows:

January 2007	**Total 3068**
February 2007	**Total 2851**
March 2007	**Total 3586**
April 2007	**Total 3035**
May 2007	**Total 3370**

19) Open Burning, Implemented

When issuing open burning permits the fire marshals of each locality are responsible for monitoring and enforcing open burning regulations in regards to air quality status. Some localities have a general ban on open burning.

Section III of III "Lawn and Garden Equipment Strategies."

Replacement of Gasoline Golf Equipment with Electric, Implemented 2005 and ongoing

Regional Commission staff are working with local retailers to provide citizens with information on lawnmower trade-ins and purchasing electric mowers.

Participating Lawn Mower Recycling Centers:

Anderson Tractor Lawn and Garden Center
21200 Virgil H Goode Hwy Rocky Mount, VA 334-2040

The Farm Store
3112 Lee Hwy, Troutville, VA 966-4522

C&R Lawn Mower Shop
7401 Hardy Rd. Hardy, VA 890-2275

Vinton Saw and Mower Service

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1227 E Washington Ave. Vinton, VA 342-6999

Second Time Around
2921 Shenandoah Ave NW, Roanoke 342-2102

The Regional Commission has also developed this flyer to educate and encourage citizens to consider alternatives to gas powered lawn and garden equipment. The flyer will be distributed to retailers in the region.

Is Your Old Lawn Mower Breaking Down??

Trade-in your old gasoline powered lawnmower for a newer, more efficient and environmentally friendly electric lawn mower. Recycling your old lawn mower ensures that the lawnmower will be discarded in an environmentally friendly fashion and you may even be entitled to a small monetary stipend towards the purchase of a new lawn mower.

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Additional Regional Success - Cradle 2 Cradle

The C2C Home Competition is a partnership between Smith-Lewis Architecture, the Roanoke Redevelopment Housing Authority, City of Roanoke and others. Information can be found at www.c2c-home.org. The program was implemented in May 2005 and is ongoing.

The C2C housing competitions is based on environmental design concepts presented in the book "Cradle to Cradle" by noted UVA Professor William McDonough. A housing design competition has held using sites in the City of Roanoke. The competition attracted over 200 entries from an international pool of architects and designers. Eight homes (various winning designs) are slated for construction.

Implementation and construction of C2C winning designs are being handled by a recently established non-profit organization. Currently the "Feather/RIFE House" design is being constructed at a modular home facility in Franklin County. It is expected to be transported to its site within one month.

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A. Control Measure	B. Summary Description of Measure	C. Program/Measure Status	D. Specific Implementation Date	E. VOC Reduction	F. NOx Reduction	G. Resources (FTE's, $$)	H. Additional Information
31 Roanoke area, VA (Effective date of nonattainment designation deferred)							
Reduce locomotive idling	Reduction of locomotive idling by the Norfolk Southern Railway Co.	Measure has been fully implemented at this time - **Completed**	May-05	0	0.153 TPD		
Limit idling-school buses	Limit on idling times for school buses through internal policy and management	Measure has been fully implemented at this time - **Completed**	May-05	0	0.003 TPD		
Retrofit 100 school buses-oxidation catalyst	Retrofit of 100 school buses in Roanoke County	**Completed**	July, 2004	0.586 TPY	1.67 TPY	144,000	
Retrofit 102 school buses-oxidation catalyst	Retrofit of 119 school buses in Roanoke City - Purchase of 21 new buses with controls	**Completed**	July, 2004	NQ	NQ	124,000 - retrofits only	
Bio-diesel solid waste trucks-purchased	Purchase of bio-diesel trucks by Roanoke City	In 2003 the City of Roanoke began purchasing bio-diesel solid waste trucks. Five trucks have been purchased as June 2006 - **Completed.**	2003 - Ongoing	0	0.27 TPY		
Ethanol alternative fuel vehicles	Purchase of ethanol alternative vehicles by Roanoke City	A total of 22 alternative fuel vehicles have been purchased by the City of Roanoke. An additional 7-10 vehicles will be purchased during the current fiscal year - **Completed**	2003 - Ongoing	NQ	NQ		
Biodiesel ready trucks	Purchase of bio-diesel trucks by Roanoke City	9 new trucks purchased since 2003. Additional 12 trucks to be purchased - **Completed**	2003 - Ongoing	NQ	NQ		
Hybrid vehicles	Purchase of hybrid vehicles by Roanoke City	Four hybrid vehicles purchased - **Completed**	Jun-05	<0.001 TPD	<0.001 TPD		
Low emissions vehicles	Purchase of low emissions vehicles	Seven vehicles purchased - **Completed**	Jun-05	<0.001 TPD	<0.001 TPD		
Implement effective environmental driving	Develop training materials and video on air quality	300 Roanoke County employees trained. Video Developed and used extensively - **Completed**	Nov-05	NQ	NQ		
Public education: Air Quality Action Day	An area-wide program of mandatory and voluntary actions to reduce ozone precursor emissions during predicted high ozone days	Program fully implemented - **Completed**	May-05	NQ	NQ	0.5 FTE	
Timing of refueling vehicles	Local and state commitments to limit refueling of vehicles during the ozone season. 14 private companies also participating in this program	Program fully implemented - **Completed**	May-05	NQ	NQ		
Promote alternative fuel vehicles	Promotion of alternative fuel vehicles as part of overall emission reduction program - web based	Program fully implemented - **Completed**	2005 - Ongoing	NQ	NQ		
Media/public relations program	Public outreach and information program to educate and inform public on air quality issues and specific ozone action days - 13 media outlets participating	Program fully implemented - **Completed**	Jun-05	NQ	NQ		
Public transit incentives	Overall program to promote the use of various transit options	300 free bus passes distributed, 361 discount summer youth pass distributed. A substantial increase in transit ridership is continuing and documented - **Completed**	May-05	NQ	NQ		
Bike Infrastructure and Amenities	Overall program to promote bicycle usage	Regional plan developed and currently being implemented - **Completed**	2005 - Ongoing	NQ	NQ		
Expand public education program	Outreach program to K-12 classes. Outreach to daycare, preschools, and summer camps	Materials produced and class arrangements being made. 50 participating daycares, preschools, and camps - **Completed**	2005 - Ongoing	NQ	NQ		
Tree planting program	Program to plant trees for environmental purposes	Implemented on an ongoing basis - **Completed**	2005 - Ongoing	NQ	NQ		
Mass transit to Blacksburg	Bus service between Roanoke and Blacksburg	Ridership is averaging about 3,000 per month during the Feb to May 2007 period - **Completed**	2004 - Ongoing	0.009 TPD	0.004 TPD	950,000	
Replace gas golf carts w/electric	Purchase/use electric golf carts at local courses	Implementation ongoing - **Completed**	End of 2005		0.061 TPY		
Replace gas mowers w/electric	Program to purchase new or electric lawn mowers	Five lawn mower sales and recycling centers currently participating in this program - **Completed**	2005 - Ongoing	0.017 TPD	0.001 TPD		
Open burning ban -expanded	Restriction of open burning on an episodic and/or seasonal basis	Program fully implemented - **Completed**	May-05	0.56 TPD	0.24 TPD		
Mandatory Restriction lawn equipment usage during ozone action days	Mandatory restriction of landscaping activities by local and state agencies during high ozone days	Program fully implemented - **Completed**	May-05	0.366 TPD	0.094 TPD		
Voluntary Private Sector Restriction lawn equipment usage during ozone action days	Voluntary restriction of landscaping activities by businesses and residents during high ozone days	Program fully implemented - **Completed**	May-05	0.072 TPD	0.016 TPD		
Cradle to Cradle Design Competition	Design and construction of environmentally friendly houses	Eight houses designed and slated for construction. Arrow/Rife House constructed - **Completed**	2005 - Ongoing	NQ	NQ		
Regional Reduction in NOx emissions	Regional program to reduce ozone transport by reducing NOX emissions form power plants	Fully implemented by state regulation during 2004 ozone season - **Completed**	May 31, 2004	NQ	NQ		
National Low Emission Vehicle Program	Requirement for the sale of low emissions vehicles	Program fully implemented by state regulation - **Completed**	1999	NQ	NQ		
Stage1 Vapor Recovery	Requirement for use of Stage I vapor recovery equipment at gasoline service stations	Fully implemented in Roanoke County, and the Cities of Roanoke and Salem - **Completed**	May-04	640.9 TPY	NA		

A. Control Measure	B. Summary Description of Measure	C. Program/Measure Status	D. Specific Implementation Date	E. VOC Reduction	F. NOx Reduction	G. Resources (FTE's, $$)	H. Additional Information
CTG RACT -- CTG VOC RACT and NOx RACT	Expansion of existing source VOC control regulations and non-CTG RACT for major NOX sources	Fully implemented region-wide by state regulation - **Completed**	Nov-05	355.5 TPY	288.4 TPY		
State Cutback Asphalt Regulation	Restriction on the use of cutback asphalt	Fully implemented by state regulation - **Completed**	Nov-05	1.75 TPY	NA		
Enhanced Ozone Forecasting tool	Preparing daily ozone forecasts during the ozone	Program is fully implemented - **Completed**	May-05	NQ	NQ	70,000 & 1 FTE	
Comments:							

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Roanoke Clean Air Plan

Roanoke Ozone Early Action Area

State Air Quality & Program Update

June 30, 2007

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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APPENDIX – Control Program and Measures Summary

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Roanoke Ozone Early Action Area Plan
State Air Quality & Program Update – June 30, 2007

Introduction

Provided in this report is a status of the state efforts to assist the Roanoke Ozone Early Action Compact (EAC) Area to implement the commitments contained in the Early Action Plan for the area. This plan was submitted as a State Implementation Plan (SIP) by the Virginia Department of Environmental Quality (VADEQ) on December 20, 2004 on behalf of the Commonwealth and the localities participating in the EAC process.

Since the formal submission of this plan, great strides have been made at the local, state, and regional levels to both implement control measures and produce emission reductions in ozone precursor pollutants. In turn, these controls and emission reductions have continued to translate into cleaner air for the Roanoke area.

To demonstrate this progress in term of improved air quality, reduced emissions and pollutant transport, and the implementation of controls, the following discussed in the remainder of this report:

- Updated air quality improvement trends and observed reductions in regional ozone transport
- Updated 2006 emissions inventory demonstrating progress towards 2007 attainment goals.
- Implementation of regional and state programs contributing to the EAP process.
- Summary and status of control measures implemented as part of the Roanoke EAP.

Air Quality Update

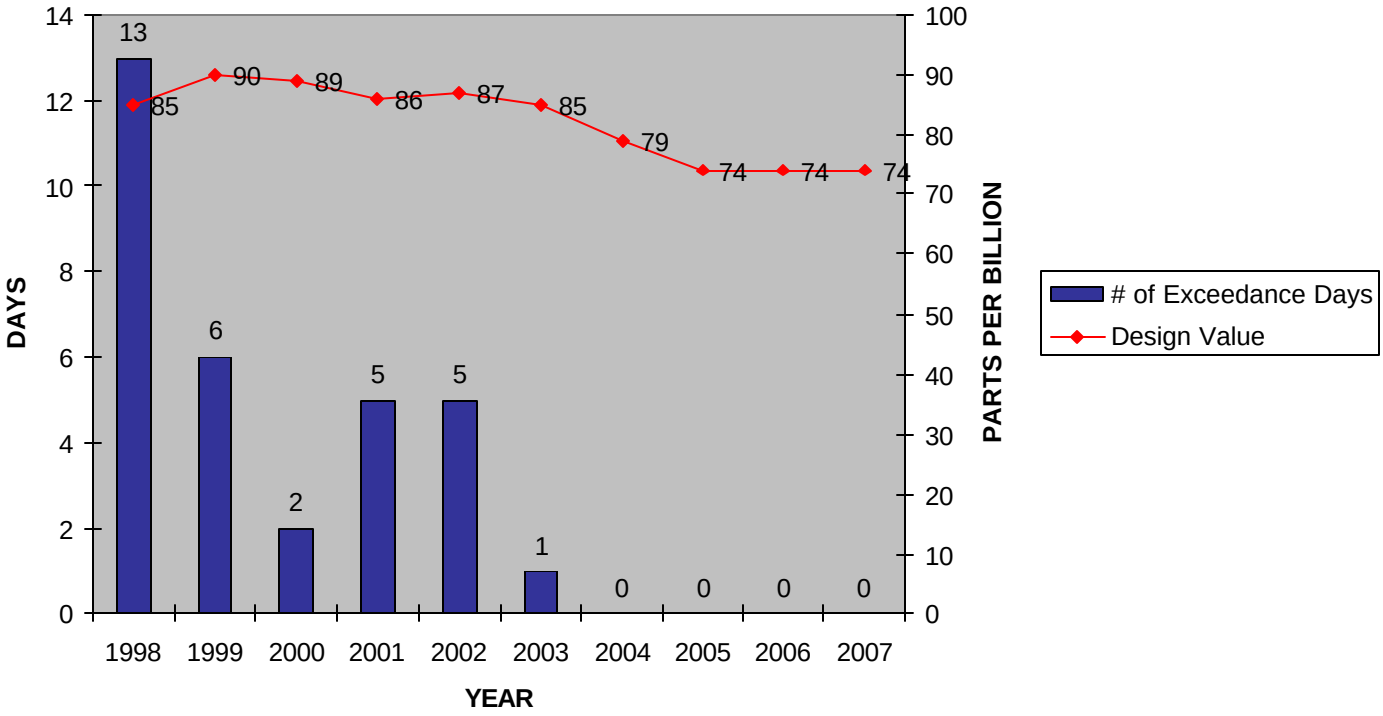
As the 2007 ozone season begins, air quality continues to improve in the Roanoke area. This is demonstrated by the fact that the area recorded no exceedances of the 8-hour ozone standard since 2003. The improvement of air quality has continued in 2006 and early 2007 despite weather more conducive to ozone formation than in previous years. This trend in air quality improvement is documented below from highs recorded in the late 1990s. As a result, the Roanoke area is now in compliance with the 8-hour ozone standard. No exceedances have been recorded in the Roanoke area during 2006 and early 2007. Please note that the 2007 ozone season data presented in this report is unofficial and only represents part of the ozone season.

Table 1 – Roanoke Ozone Exceedance & Design Value Trends

YEAR	*# OF EXCEEDANCE*	*3-YEAR DESIGN VALUE*
1998	13	**85 Parts Per Billion (PPB)**
1999	6	**90 PPB**
2000	2	**89 PPB**
2001	5	**86 PPB**
2002	5	**87 PPB**
2003	1	**85 PPB**
2004	0	**79 PPB**
2005	0	**74 PPB**
2006	0	**74 PPB**
2007*	0*	**74 PPB***

*** Unofficial and partial season data for 2007**

Figure 1 – Roanoke Ozone Exceedance & Design Value Trends



Of equal or even more importance than the local ozone air quality improvement in Roanoke is the trends being observed in the reduction of ozone being transported in to Virginia and the EAC areas. Small areas like Roanoke and Winchester, with relatively small local ozone precursor pollutant emissions are significantly impacted by the regional pollutant load of ozone that is generated in upwind areas and transported into these areas by typical summer weather patterns.

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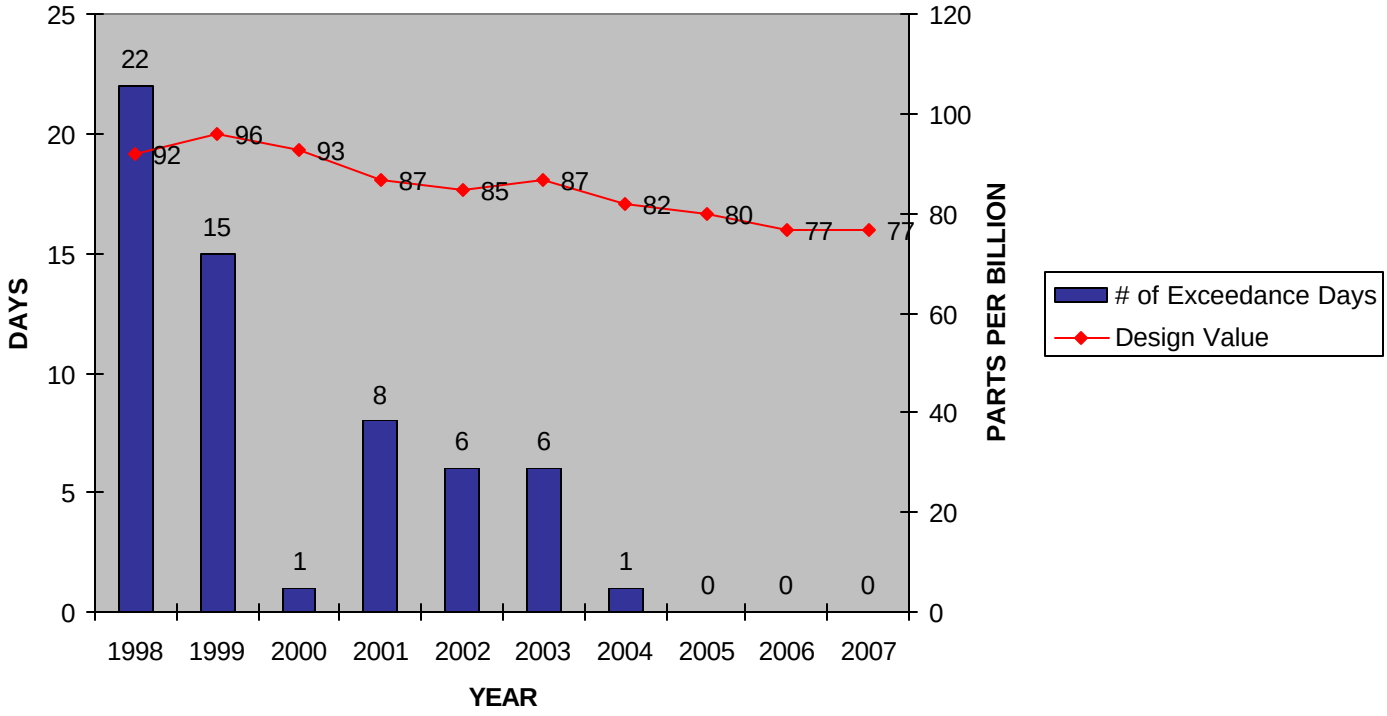
To track and analyze the influence of transported ozone, Virginia has a long standing high-altitude monitor in the Shenandoah National Park (SNP) at Big Meadows. It is well accepted that high ozone values observed at this monitor is reflective of pollution being transported into Virginia from areas west of this monitoring station. As shown below, ozone air quality has also improved significantly at the SNP monitor.

Figure 2 – Big Meadow (SNP) Ozone Exceedance & Design Value Trends



To investigate this reduction in transported pollution, the following analysis was performed. The table and charts presented below show that the average ozone levels measured at Big Meadows during ozone exceedance days has dropped from 1998 to 2006 by about 12 ppb.

Table 2 – Range of Big Meadows Hourly Average Concentrations

YEAR	AVERAGE CONCENTRATION RANGES
1998	69 TO 80 PPB
1999	65 TO 76 PPB
2000	67 TO 74 PPB
2001	68 TO 75 PPB
2002	58 TO 70 PPB
2003	70 TO 77 PPB
2004	56 TO 69 PPB
2005	54 TO 63 PPB
2006	60 TO 68 PPB

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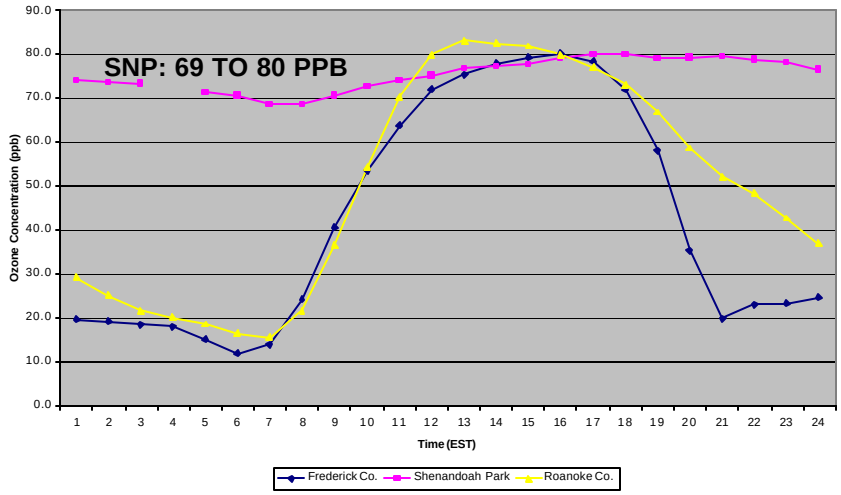
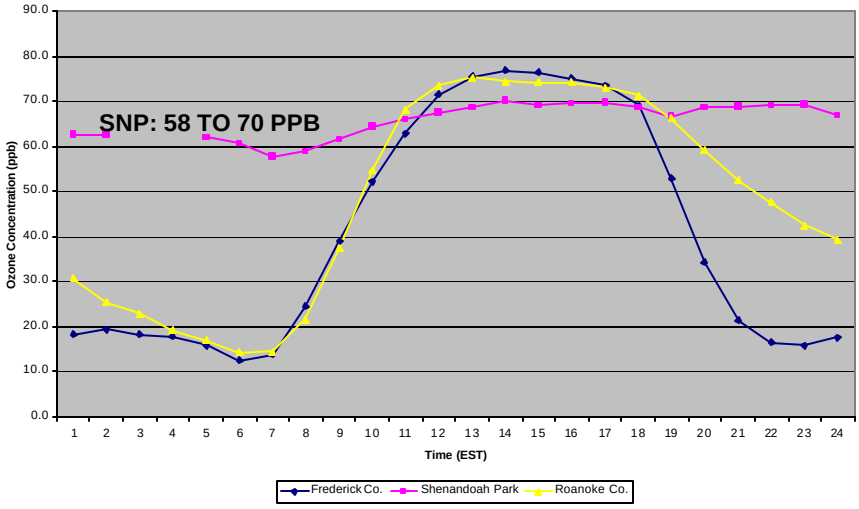
Figure 3-5: Reduction in Ozone Transport (1998, 2002, & 2005)

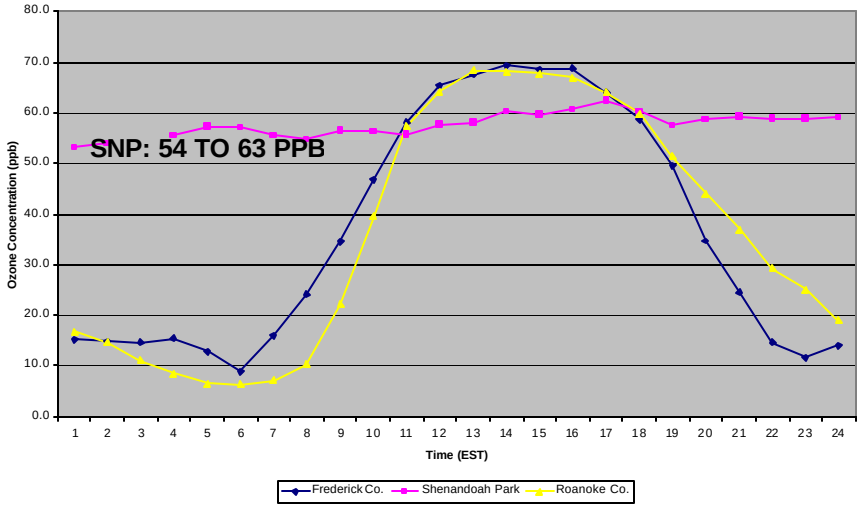
Hourly Ozone Concentration (1998 8- hr Exceedance Days)



Hourly Ozone Concentration (2002 8-hr Exceedance Days)



Hourly Ozone Concentration (2005 8-hr Exceedance Days)



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This reduction is the regional ozone load is due to a number of control programs implemented to reduce ozone precursor emissions on the state and national levels. Most significant of these, the regional reduction of Oxides of Nitrogen (NO_X) emissions from power plants

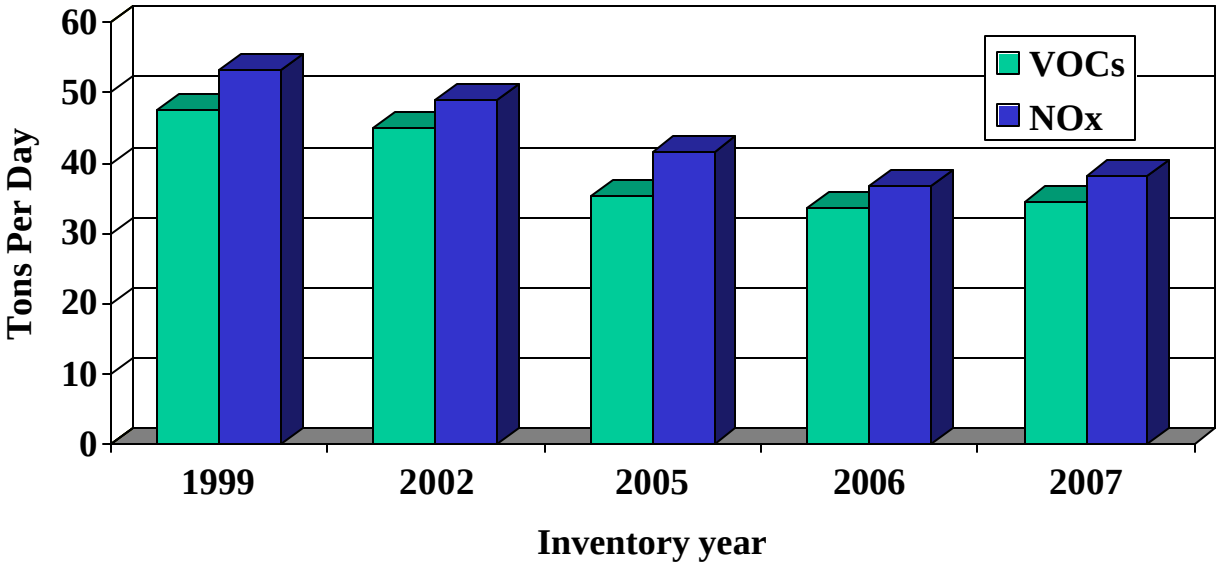
Emissions Inventory Update

To demonstrate that the Roanoke area is making good progress towards the emissions reductions committed to in the EAP, a preliminary 2006 emissions inventory for the area has been developed and is presented below along with a comparison to the 1999, 2002, 2005, and 2007 emissions inventories developed to support the planning process.

Table 3 – Roanoke Area Emissions Inventories and Trends

Source Category	1999 (Baseline)	2002 (Interim)	2005 (Previous Year)	2006 (Current Year)	2007 (Control Case)
Point Sources	4.551	3.518	3.510	2.880	3.927
Area Sources	18.845	19.360	14.590	14.696	15.300
Non-road Sources	6.063	5.922	4.718	3.988	4.352
Mobile Sources	18.074	16.071	12.600	11.935	10.813
Totals:	**47.533**	**44.871**	**35.418**	**33.499**	**34.392**
Point Sources	9.312	7.231	6.560	6.200	7.086
Area Sources	5.091	5.254	4.343	4.399	5.293
Non-road Sources	7.877	8.036	5.201	3.694	6.424
Mobile Sources	31.036	28.336	25.500	22.350	19.481
Totals:	**53.316**	**48.857**	**41.604**	**36.643**	**38.284**

Figure 4 – Roanoke Area Emissions Inventory Trends



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The Roanoke area has already met the attainment year (2007) goals. In fact, the 2006 emissions levels are below the 2007 attainment emissions level goals for both pollutants.

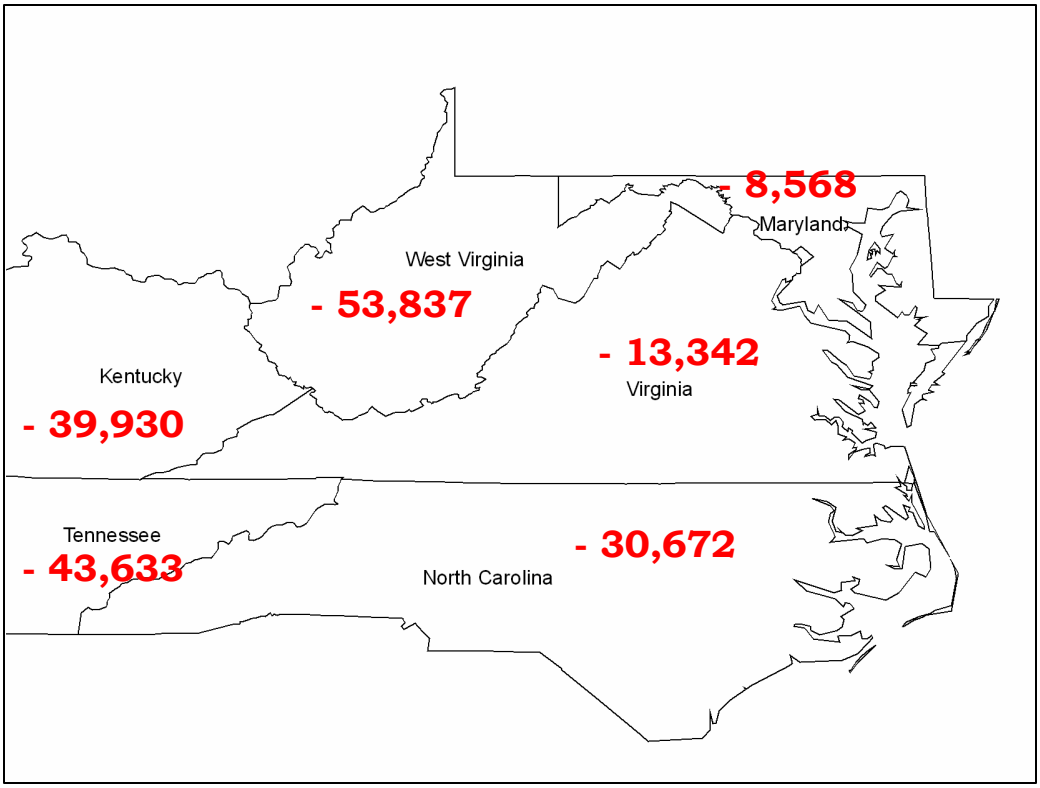
Regional/State Programs Update

The Virginia Department of Environmental Quality (VADEQ) has implemented several control measures to assist the Roanoke area in achieving its air quality goals.

1. Regional Reduction of NO_X Emissions (SIP Call)

The most significant of these programs has been the regional program to reduce NO_X emissions from power plants and large industrial boilers. This regional program, commonly known as the "NO_X SIP Call", was established by the EPA to address the transport of ozone and precursor emissions in the eastern United States. Virginia, along with 22 other state became subject to this rule. Recent reductions in ozone have been linked to this program and the significant reduction of NO_X emissions in the SIP Call control area. An assessment of NO_X emissions and emissions reductions has also been performed for Virginia and surrounding states using data from the EPA Clean Air Markets Division.

Figure 5 – NO_X Emissions Reductions from 2002 to 2006



TOTAL REDUCTION: 189,082 TONS/SEASON

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As can be seen by this analysis, significant NO_X emissions reductions are being achieved through the SIP Call program that is certainly contributing to the improvement in air quality being observed throughout the region and specifically in the EAC areas.

2. National Low Emissions Vehicle Program

The National Low Emissions Vehicle (NLEV) program is a voluntary clean vehicle program established by the EPA through national regulation on December 16, 1997. Due to the voluntary nature of the program, it was contingent upon agreement by a number of Northeast states and the major automobile manufacturers. Virginia opted into this program for lower vehicle emissions standards, beginning with model year 1999 vehicles and subsequently adopted a state NLEV regulation, 9 VAC 5 Chapter 200, which became effective on April 14, 1999.

This program along with the federal motor vehicle control programs, have and continue to provide substantial emissions reductions in Virginia that will assist areas like Roanoke in meeting air quality standards and goals.

3. Existing Source Controls and NO_X RACT

To address local point source emissions, the state extended certain exiting source and Reasonably Available Control Technology (RACT) regulations to the Roanoke area to reduce the local contribution to ozone formation. These regulations were adopted by the Air Pollution Control Board in October 2003 and became effective on March 23, 2004. Compliance with these regulations was then required by November 15, 2005. These regulations mainly apply to two categories of sources which are described below.

A number of state regulations (Chapter 40) regarding exiting sources of the Volatile Organic Compound (VOC) have been extended to the Roanoke area. These regulations are as follows:

Article 5 - Synthesized Pharmaceutical Products Manufacturing Operations
Article 6 – Rubber Tire Manufacturing Operations
Article 11 – Petroleum Refinery Operations
Article 24 – Solvent Metal Cleaning Operations Using Non-Halogenated Solvents
Article 25 – Volatile Organic Compound Storage and transfer Operations
Article 26 – Large Appliance Coating Application Systems
Article 27 – Magnet Wire Coating Application Systems
Article 28 – Automobile and light Duty Truck Coating Application Systems
Article 29 – Can Coating Application Systems
Article 30 – Metal Coil Coating Application Systems
Article 31 – Paper and Fabric Coating Application Systems
Article 32 – Vinyl Coating Application Systems
Article 33 – Metal Furniture Coating Application Systems

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Article 34 – Miscellaneous Metal Parts and Products Coating Application Systems
Article 35 – Flatwood Paneling Coating Application Systems
Article 37 – Petroleum Liquid Storage and Transfer Operations
Article 39 – Asphalt Paving Operations (Cutback Asphalt Restrictions)

Once these regulations became effective, the VADEQ regional office identified 33 point sources in the Roanoke area that were potentially subject to one or more these regulations (not including gasoline service stations). These sources were subsequently notified of the potential applicability of these regulations by letter dated March 12, 2004.

As a result of this notification process, eight sources were determined to be exempt from these rules. The remaining sources have been determined to be in compliance with the applicable rule(s) and/or have permits which include VOC control requirements equal to or more stringent that the Chapter 40 requirements. Compliance with these regulations is specific to the individual process and regulation and mainly relies on VOC content limitations and/or emission reduction requirements. The estimate of about 1 ton per day of cumulative reductions from these requirements remains valid. The reductions from cutback asphalt restriction also remain valid (0.005 tons per day).

In addition to these controls, the gasoline bulk terminal requirements of Article 37 were also extended to Bedford County which is adjacent to the Roanoke EAC area. There are five bulk terminal facilities located in this County and all five have been issued State Operating Permits which include the Article 37 requirement. Furthermore, all these facilities are now in compliance with these requirements that provide additional VOC reductions above and beyond those claimed in the Roanoke EAP.

The second part of the control requirements involved case by case RACT determinations for major sources of NO_X. Three point sources in the Roanoke area were identified as being subject to this requirement which resulted in source specific RACT determinations and permits that were submitted to the EPA and approved as separate SIP revisions as part of the overall EAP SIP. The current compliance status of these three facilities is as follows:

<u>Roanoke Cement:</u> A RACT permit was issued to this source on December 22, 2004. As of November 15, 2005, the emissions from the RACT applicable unit have been reduced by a combination of process controls and good combustion practices. In addition, during the plant shutdown in January 2006, the source installed low NO_X burners to its cement Kiln system which has further reduced emissions from this facility.

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Roanoke Electric Steel: A RACT permit was issued to this source on December 22, 2004. This permit required that NO_X emissions from the source be controlled through a combination of proper operation and maintenance, and low NO_X burners. The source is currently in compliance with all the conditions of this RACT permit.

Norfolk Southern Railroad: A RACT permit was issued to this source on December 22, 2004. This permit required that NO_X emissions from the source be controlled by meeting a 0.4 lbs/mmBtu emission rate for the power plant boilers at the facility. Initial source testing was conducted in November 2005 which indicated a violation of RACT emission rate. Subsequently, the DEQ issued the facility a Notice of Violation (NOV). Subsequently, the source retested in March 2006 and has now demonstrated compliance with the RACT emission rate. A consent order was signed by the company in August which included a civil penalty of $5,700. The company now plans to permanently retire the facility power plant and the boilers involved by the end of June 2007.

Due to the fact that many of the requirements of these RACT permits did not become effective until late 2005, emissions estimates resulting from these requirements are not yet available. However, it should be noted that total point source NO_X emissions in the Roanoke area are already below the projected 2007 post control attainment levels as presented in the emission inventory section of this report.

4. Enhanced Ozone Forecasting tool for the Roanoke Area

One of the main components of the local early action program is a the establishment of an zone action days program. This program requires a combination of mandatory and voluntary action by local governments and residents to reduce ozone precursor producing activities and emissions. In order to implement such a program, daily air quality forecasts are needed. To support this program, the VADEQ has completed the following actions to enhance the ozone forecast and health advisory program for the Roanoke area:

- The VADEQ contracted with Sonoma Technologies Inc. to develop an enhanced ozone forecasting tool for various areas in Virginia, including the Roanoke area. This work has been completed.
- An additional meteorologist has been hired to support the VADEQ air quality forecast and advisory program.
- The forecasts for the Roanoke area have been updated to reflect the 8-hour ozone standard. In addition, daily forecasts for fine particulate matter are now being issued for the Roanoke area all year.

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- The Roanoke area has been updated on the VADEQ air quality forecast webpage, and on the EPA's AIRNOW national forecast webpage to reflect these changes. These sites are shown in the figures below:

Figure 6 – VADEQ Air Quality Forecast Page

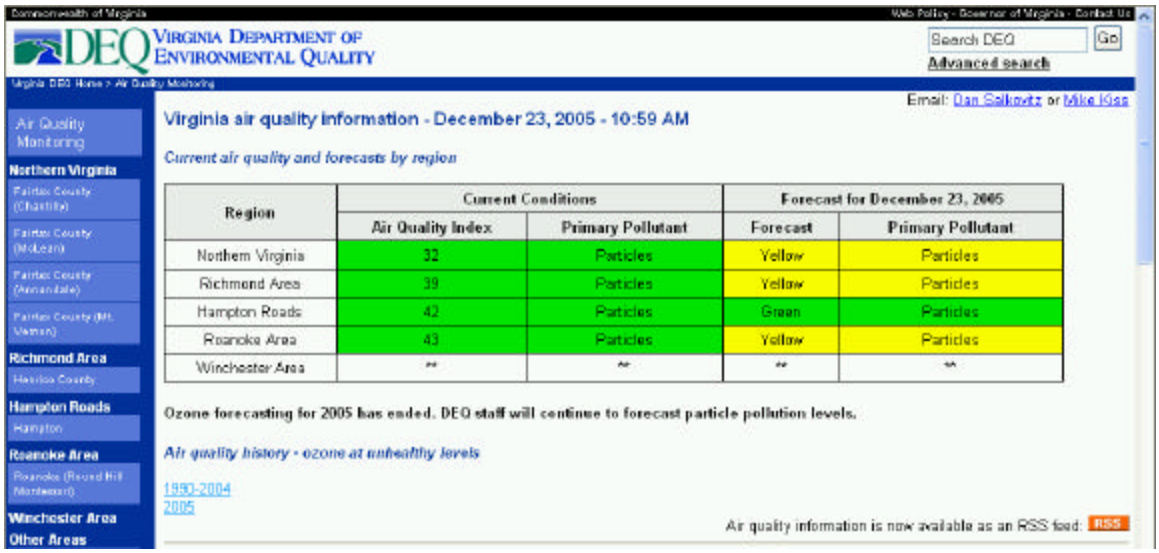
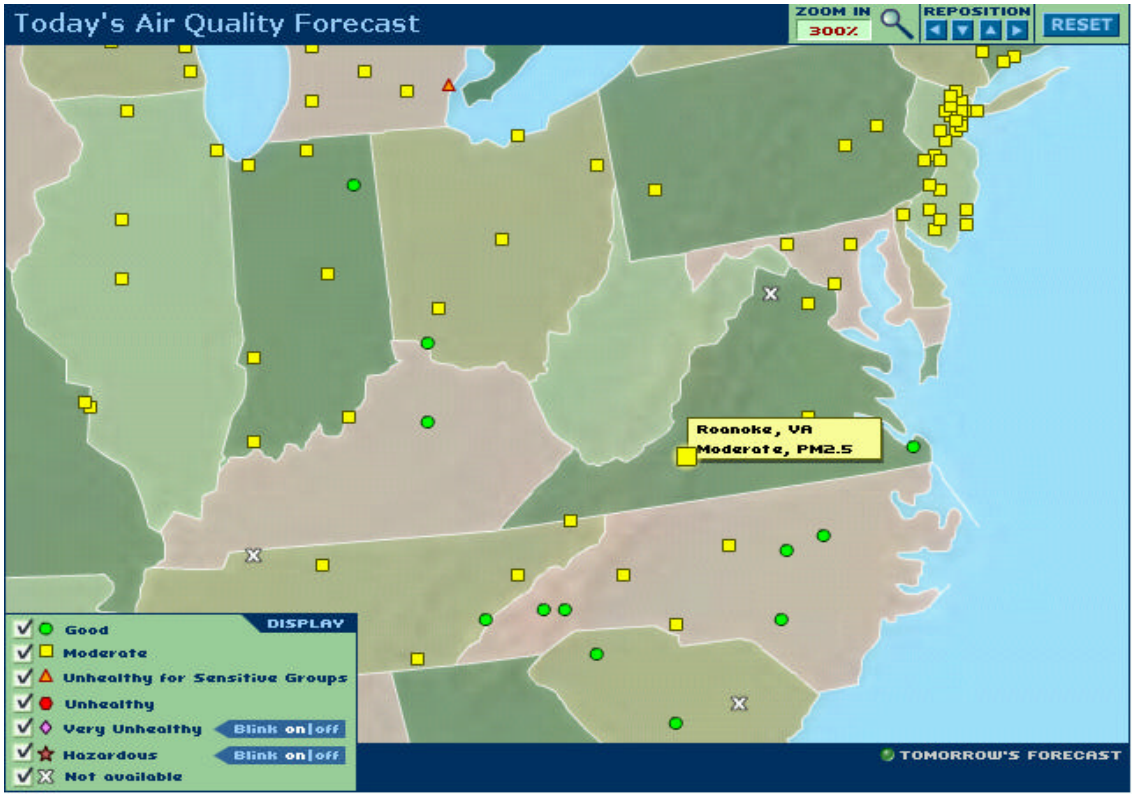


Figure 7 – EPA AIRNOW Air Quality Forecast Page



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5. School Bus Emissions Control Retrofit Program

As part of a EPA/VADEQ funded and administered program, Roanoke County and the City of Roanoke have completed projects to retrofit a significant number of school buses with emission control technologies. The results of these projects are as follows:

Roanoke County: 100 school buses retrofitted with diesel oxidation catalysts (DOC) at a total cost of $144,000.

Roanoke City: A total of 140 school buses retrofitted or purchased new with DOC. The electronic control modules (ECMs) on 19 buses have also been reprogrammed to further reduce NO_X emissions. Total cost of the retrofit portion of the project was $124,000.

6. Stage I Vapor Recovery Control at Service Stations

Section 9 VAC 5-40-5200 B. 3.of Article 37 of the Chapter 40 VOC regulations specifically requires the installation and use of Stage I vapor control and recovery systems at services stations in Roanoke County and the Cities of Roanoke and Salem. A final compliance review has been completed and has reaffirmed that 100% compliance with this regulation has been achieved in the area.

7. State Open Burning Regulation (NEW)

On June 21, 2006 the State Air Pollution Control Board gave final approval to the expansion of a more restrictive seasonal open burning control program to the Roanoke area. This more restrictive program became effective in October 2006.

Control Program and Measures Summary

In general, the Roanoke area and its state and federal partners have been very successful in implementing the commitments contained in the Early Action Plan. A summary of the control measures and estimated reductions in 2007 is presented below. No changes have occurred in the emission reduction estimates since the 2004 SIP. The Appendix to this report contains a summary table of the control measures implemented in the Roanoke area. More details on local implementation of measures are provided in the local area status report for June 2006.

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Control Measures & Estimated Emissions Reductions (2007)

Emissions Control Measures	VOC (tpd)	NO_X (tpd)	Modeled
State/Federal Area Source Controls			
Stage I Vapor Recovery at Gasoline Service Stations (Federally Enforceable)	1.756	0.000	YES
Architectural Products – Federal Rule (Federally Enforceable)	0.372	0.000	YES
Consumer Products – Federal Rule (Federally Enforceable)	0.178	0.000	YES
Metal Cleaning Solvents – Federal Rule (Federally Enforceable)	0.163	0.000	YES
Motor Vehicle Refinishing – Federal Rule (Federally Enforceable)	0.158	0.000	YES
Cutback Asphalt – State Rule (Federally Enforceable)	0.005	0.000	YES
Emissions Control Measures	**VOC (tpd)**	**NO_X (tpd)**	**Modeled**
Subtotals:	**2.632**	**0.000**	
Federal Non-Road Source Controls			
Small Gasoline Engine Standards – Federal Rule (Federally Enforceable)	1.681	0.059	YES
Diesel Engine Standards – Federal Rule (Federally Enforceable)	0.158	0.969	YES
Locomotive Engine Standards – Federal Rule (Federally Enforceable)	0.000	1.112	YES
Large Gasoline Engine Standards – Federal Rule (Federally Enforceable)	0.146	0.546	YES
Recreational Engine Standards – Federal Rule (Federally Enforceable)	0.015	0.000	YES
Subtotals:	**1.995**	**2.686**	
Federal Mobile Source Controls			
Previous Motor Vehicle Standards – Federal Rule (Federally Enforceable)	6.343	7.600	YES
Tier 2 Vehicle Standards – Federal Rule (Federally Enforceable)	0.917	3.799	YES
Heavy Duty Diesel Standards – Federal Rule (Federally Enforceable)	0.001	0.156	YES
Subtotals:	**7.261**	**11.555**	
State/Local Early Action Plan Controls			
Existing Source CTG RACT Controls – State Rule (Federally Enforceable)	1.098	0.790	YES
Ozone Action Days Program – State/Local (Mandatory/Voluntary)	0.918	0.611	YES
Open Burning Restrictions – Local (Soon to be replaced by State Rule)	0.564	0.238	NO
All Other Local Programs – Local (Voluntary)	0.020	0.228	NO
Subtotals:	**2.580**	**1.639**	
TOTALS:	**14.468**	**15.880**	