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COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 629 East Main Street, Richmond, Virginia 23219

Mailing address: P.O. Box 10009, Richmond, Virginia 23240

Fax (804) 698-4500 TDD (804) 698-4021

www.deq.virginia.gov

L. Preston Bryant, Jr.
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

December 28, 2006

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

Dear Judy:

The purpose of this letter is to formally transmit the December 2006 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 document the 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 continue to be 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 in this effort.

Sincerely,

/ S / TRB – December 28, 2006

Thomas R. Ballou, Director
Office of Air Data Analysis and Planning

Enclosures

cc: M. Morris, EPA R3
E. Wentworth, EPA R3
D. Cole, EPA OAQPS
J. Sydnor, VADEQ



Ozone Early Action Plan

Northern Shenandoah Valley

December 15, 2006

Mr. James E. Sydnor, Acting Director
Air Division
Virginia Department of Environmental Quality
629 East Main Street, 8th Floor
Richmond, VA 23219

**RE: Ozone Early Action Plan for Northern Shenandoah Valley
December 2006 Progress Report Submittal to US EPA**

Dear Mr. Sydnor:

This submittal includes the 7th semi-annual Early Action Compact status report for The Northern Shenandoah Valley Region in the Commonwealth of Virginia. Per the October 3, 2006, communication received from Ellen Wentworth of US EPA Region 9, the following elements are included:

Documentation of any progress from the period June 2006 – December 2006 includes:

- Major events and meetings that have taken place;
- Status of control measures that have already been implemented;
- Any impediments to implementation; and
- An updated summary chart depicting the status of the implemented control measures of the Northern Shenandoah Valley Early Action Compact Area.

What follows in the report is this brief introductory memo followed by actions taken to fulfill early action compact milestones during the period of June 2006 to December 2006.

The Winchester-Frederick County Economic Development Commission has administered and continues to administer the overall Ozone Early Action Plan (EAP) for the Northern Shenandoah Valley. If you have any questions regarding our submittal, please contact me at (540) 665-0973.

Sincerely,

Patrick Barker, AICP
Executive Director



Ozone Early Action Plan **Northern Shenandoah Valley**

7th Semi-Annual Status Report **for** **The Northern Shenandoah Valley** **Ozone Early Action Compact Area**

December 31, 2006



Ozone Early Action Plan

Northern Shenandoah Valley

Table of Contents

List of Figures	i
List of Tables	ii
I. Introduction	1
Project Organization and Summary to Date	1
Summary of Events (June to December 2006)	1
II. Implementation Status of Early Action Control Measures	4
Local Phase I Controls	4
1. Ozone Action Days/Public Awareness	4
General Public Awareness Program/Education and Promotion Campaign	4
School-based Public Awareness Program	11
Employer-based Ozone Action Days/Ozone Action Days for Area Sources	14
Dynamic Message Signs	15
Video Monitor System Deployment	16
Lawn & Garden Equipment Usage Restrictions	18
2. VMT Reduction Programs	18
Enhance/Expand existing Northern Shenandoah Valley Regional Commission	
(NSVRC) Ridesharing Program	18
Bicycle and Pedestrian Accommodation	20
Promote Green Space Preservation	22
Promote Mixed Use Development	25
Promote Telecommuting	26
3. Open Burning Restrictions	26
4. Engine Idling Restrictions	27
5. School Bus/Heavy Duty Fleets Retrofits	28
6. Voluntary Industrial Reductions	28
III. Appendices	A



Ozone Early Action Plan

Northern Shenandoah Valley

List of Figures

Figure 1. National Alternative Fuel Vehicle Day Odyssey, Air Quality stations: a) m ³ model; b) vehicle simulator; c) tire pressure measurement	13
Figure 2. Smog Dog: a) Valley AIRNow mascot; b) posing with students during National Alternative Fuel Vehicle Day Odyssey.	13
Figure 3. VDOT variable message sign locations for Bristol, Salem, and Staunton Districts.	16
Figure 4. IP-addressable camera overlooking Interstate 81	16
Figure 5. Shenandoah Valley map of IP-addressable traffic camera locations	17
Figure 6. Phase 1 of the Winchester Green Circle Project	24
Figure 7. Town Run Linear Park—proposed Phase 1-A.....	24



Ozone Early Action Plan

Northern Shenandoah Valley

List of Tables

Table 1. Locations of VDOT traffic cameras in the Northern Shenandoah Valley.	17
Table 2. NSVRC Park and Ride Lots in the Northern Shenandoah Valley area.....	20
Table 3. VOF Recorded Easements in Frederick County and City of Winchester.....	23

I. Introduction

Project Organization and Summary to Date

This report represents the 7th semi-annual status report for the Northern Shenandoah Valley (NSV) Early Action Compact Area in Virginia, which consists of the City of Winchester and Frederick County. 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 air pollution in the area. Specifically, this report covers the period from June 30, 2006, to December 31, 2006.

The EAC process in the Northern Shenandoah Valley (NSV) area began in the fall of 2002, with the establishment of the NSV Air Quality Improvement Task Force and the formal development and signing of the Early Action Compact in December 2002. Moving forward, a series of required documents has been produced, culminating in the submission of the official EAP in March 2004. Provided below is a listing and timeline of the products and documents provided by the NSV EAC effort:

- **December 31, 2002** – Early Action Compact for the Northern Shenandoah Valley Area.
- **June 16, 2003** – Potential local control list submission.
- **June 30, 2003** – 1st Semi-Annual Status Report, January to June 2003.
- **December 31, 2003** – 2nd Semi-Annual Status Report, July to December 2003.
- **March 31, 2004** – Ozone Early Action Plan for the Northern Shenandoah Valley Area.
- **June 30, 2004** – 3rd Semi-Annual Status Report, January to June 2004.
- **December 31, 2004** – State Implementation Plan.
- **June 30, 2005** – 4th Semi-Annual Status Report, January to June 2005.
- **December 30, 2005** – 5th Semi-Annual Status Report.
- **June 30, 2006** – 6th Semi-Annual Status Report.

All these documents, along with other information concerning the EAC program and other EAC areas, can be viewed at and retrieved from the following Web sites:

EPA - <http://www.epa.gov/ttn/naaqs/ozone/eac/index.htm>

Valley AIRNow - <http://www.valleyairnow.com/Reports&Meetings.htm#Submittals>

Efforts on the state and local levels have now moved towards the maintenance and enforcement 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 6th Semi-Annual Status Report on June 30, 2006.

Summary of Events (June to December 2006)

Provided below is a listing of major events held and actions taken during the period covered by this status report toward the implementation and maintenance of the local ozone air-quality improvement plan and associated nonattainment implications:

July 17 - 24, 2006 - Valley AIRNow ran several week-long, live-read public service announcements on area radio stations regarding air-quality tips during the summer season.

July 24 - 31, 2006 - Valley AIRNow ran a prerecorded public service announcement on local public television stations to promote proper tire maintenance during the summer season. The public service announcement was provided by the Federal Highway Administration.

August 2, 2006 – Northern Shenandoah Valley Air Improvement Task Force meeting was administered by Valley AIRNow.

August 3, 2006 – Valley AIRNow attended a Commute Smart Virginia meeting at the American Lung Association of Virginia Headquarters in Richmond, Virginia.

August 7 – 14, August 21 – 28, and September 4 - 11, 2006 – Valley AIRNow ran a weeklong, prerecorded public service announcement on area radio stations promoting proper tire maintenance during ozone season. The public service announcement was provided by the American Lung Association of Virginia and the Virginia Department of Environmental Quality's Office of Environmental Education.

August 22, 2006 – The Metropolitan Planning Organization (MPO) Bicycle and Pedestrian Mobility Plan consultant and MPO Steering Committee toured the city and county in an effort to educate the consultant on key concerns and corridors in the area.

September 6, 2006 – Northern Shenandoah Valley Air Improvement Task Force meeting was administered by Valley AIRNow.

September 7, 2006 – Valley AIRNow participated in a Commute Smart Virginia teleconference coordinated by the American Lung Association of Virginia. Valley AIRNow presented information to attending members on its I-81 Idle Reduction program.

September 18, 2006 – The Winchester-Frederick County Metropolitan Planning Organization held a Stakeholder meeting to discuss the Bicycle and Pedestrian Mobility Plan.

September 19 - 20, 2006 – Valley AIRNow attended the 2006 Virginia Naturally Conference for Environmental Educators at Smith Mountain Lake, Virginia. On Day Two of the Conference, Valley AIRNow held an informational air-quality session titled "Road Trip to Cleaner Air". Participants of the session were provided with a brief introduction to the science surrounding air quality, air pollution impacts on human health and natural resources in Virginia, and individual actions that make a difference in improving the quality of our air.

September 20, 2006 – The Frederick County Planning Commission unanimously approved the authorization to apply for a Virginia Department of Transportation Enhancement Grant to implement bicycle and pedestrian improvements along Senseny Road.

September 20 - 21, 2006 – The Virginia Outdoors Foundation held a Policy and Easement Consideration Board meeting in Charlottesville. Recent easement applications and proposals from various counties across Virginia were discussed.

September 25, 2006 – Frederick County held a Transportation Committee meeting to discuss the county bus service, MPO Bicycle and Pedestrian Mobility study, and the development of an access management plan to study the I-81/Route 11/Shady Elm interchange.

September 30, 2006 – Opportunity Winchester, a citizen-led initiative supported by the city government, hosted a Street Festival in downtown Winchester to provide information to the public by area nonprofit organizations and public agencies. Valley AIRNow collaborated with the Valley Commuter Assistance Rideshare Program to staff an informational booth and distribute educational ozone materials to the community.

September 30, 2006 – Valley AIRNow staffed an air-quality booth at the James Madison University Open House. Educational ozone materials were distributed to hundreds of prospective students from across the state.

October 2, 2006 – Valley AIRNow met with the superintendent of schools for the Frederick County Public School system. Future involvement between Valley AIRNow and Frederick County Public Schools was discussed.

October 5, 2006 – Valley AIRNow participated in a Commute Smart Virginia teleconference coordinated by the American Lung Association of Virginia. Valley AIRNow provided an update on the development of its Idle Reduction Campaign for schools.

October 7, 2006 – The 3rd Annual Green Circle Fall Fitness Fair Adult 5K and Kids' 1-Mile Run took place. Valley AIRNow placed an educational ozone bookmark in approximately 100 runner's packets.

October 12, 2006 – James Madison University hosted a National Alternative Fuel Vehicle Day Odyssey location. SHENAIR and Valley AIRNow staffed an educational air-quality exhibit for hundreds of area students in grades 5 – 12. Students were provided with a brief introduction to air quality in Virginia and participated in several interactive stations to educate them on available learning resources and actions they can take as individuals to improve the air we breathe.

October 17, 2006 – Valley AIRNow met with the assistant superintendent of instruction for the Frederick County Public School system. Future involvement between Valley AIRNow and Frederick County Public Schools was discussed.

October 18, 2006 – The Winchester-Frederick County Chamber of Commerce hosted a Regional Transportation Summit to address traffic congestion in the area.

October 19, 2006 – The Northern Shenandoah Valley Regional Commission and Warren County board of supervisors hosted a Balanced Growth Counties Conference entitled, "The Challenges: Preserving the Valley's Agricultural and Open Space Heritage and Meeting the Service Needs of New Development."

October 26, 2006 – Valley AIRNow joined the Mid-Atlantic Diesel Collaborative. Due to the newly developed Air Quality Action Day program for the Winchester-Frederick County freight industry, as well as enhanced participation with area schools, Valley AIRNow enrolled in the Freight and Clean School Bus Sector Workgroups.

November 1, 2006 – The Northern Shenandoah Valley Air Improvement Task Force meeting was administered by Valley AIRNow.

November 13, 2006 – The Winchester-Frederick County Metropolitan Planning Organization held a public meeting to review the first draft maps of the Bicycle and Pedestrian Mobility Plan.

November 13 - 14, 2006 – Valley AIRNow participated in a GLOBE (Global Learning and Observations to Benefit the Environment) Train the Teacher Workshop at James Madison University. Consequently, Valley AIRNow staff became certified GLOBE trainers.

November 15 - 16, 2006 – The Virginia Outdoors Foundation held a Policy and Easement Consideration Board meeting in Charlottesville. Recent easement applications and proposals from various counties across Virginia were discussed.

November 16, 2006 – Valley AIRNow participated in a Mid-Atlantic Diesel Collaborative Clean School Bus Sector Workgroup Conference Call during which the EPA Diesel Emissions Quantifier (DEQ) is reviewed. For meeting agenda and attachments, refer to Appendix B-1.

November 28, 2006 – Valley AIRNow participated in a Mid-Atlantic Diesel Collaborative Freight Sector Workgroup Conference Call. To view the meeting agenda, refer to Appendix B-17.

November 30, 2006 - The Virginia Department of Conservation and Recreation (DCR) held public meetings to review the draft of the 2007 Virginia Outdoors Plan, focusing on the Northern Shenandoah Valley Regional Commission - Planning District 7 (PD-7).

December 4, 2006 - Valley AIRNow and SHENAIR met with the Assistant Superintendent of Administration for the Frederick County Public School system. A pilot biodiesel program for county school buses was presented.

December 7, 2006 – Valley AIRNow participated in a Commute Smart Virginia teleconference coordinated by the American Lung Association of Virginia.

II. Implementation Status of Early Action Control Measures

This section describes the status of each emission-control measure included in the early action plan. Appendix A includes a tabular summary of each emission-control measure, implementation dates, emissions reductions, and applicable resources.

Local Phase I Controls

The Phase I strategies were implemented as of December 2005 and have since been upheld, maintained, and enforced. These measures have the greatest public acceptance and will provide an important foundation for continued future efforts.

1. Ozone Action Days/Public Awareness

Valley AIRNow is an education and outreach program supported financially by the localities of Winchester City and Frederick County and by the SHENAIR Institute at James Madison University. The SHENAIR Institute operates Valley AIRNow under the advice and consent of the Task Force. Valley AIRNow staff mainly performs activities falling under this control measure.

Control Strategies:

General Public Awareness Program/Education and Promotion Campaign

Valley AIRNow Air Quality Hotline: Maintained 2006

The air-quality hotline provides daily air-quality forecasts during ozone season, information about how to contact Valley AIRNow, and messaging-service capabilities. The hotline number is (540) 450-2207. During the off season, the hotline is operable only in its messaging-service capabilities. The forecasting service is suspended but still provides the community with a message center to voice any questions or concerns.

Valley AIRNow Email System: Maintained 2006

The community can contact Valley AIRNow via email at: info@valleyairnow.com. The system is checked for messages every weekday, and responses are returned promptly within one business day or less.

Valley AIRNow Web site: Ongoing 2006

The Valley AIRNow website can be accessed at: www.valleyairnow.com. Air-quality information is added on a weekly basis to keep local residents informed of the most current and up-to-date news on ground-level ozone. In addition, the community can stay informed of recent and upcoming Valley AIRNow events by visiting the "News & Updates" page at <http://www.valleyairnow.com/newsandupdates.html>. Photographs from these events are made available to the public at <http://www.valleyairnow.com/pictures.htm>. Other staples of the Valley AIRNow Web site include: Task Force meeting materials, EPA submittals, congestion and haze web cameras, and a local air-quality Media Center.

Valley AIRNow continues to partner with the Federal Highway Administration's *It All Adds Up to Cleaner Air* initiative to make seasonal air-quality web content available at www.valleyairnow.com. This content can be inserted into the Valley AIRNow Web site for free at http://www.italladdsup.gov/community_partners/dc_readytogo_03.asp and viewed by clicking the "What Can We Do" tab or by pasting <http://www.valleyairnow.com/whatcanwedo.html> into a web browser.

News Coverage (PRINT): Ongoing 2006

The *Winchester Star* has published several articles related to Valley AIRNow events and air-quality issues in the area.

- April 28, 2006 – Open Forum: "Take it Personally – What You Can Do to Combat 'Noxious' Ozone" (Appendix C-1).
- May 17, 2006 – Open Forum: "Having a Bad 'Air' Day?" (Appendix C-2)
- May 20, 2006: "Telecommuting an Environmentally Friendly Convenience – Completing Work Via Computer and Telephone Cuts Down on Driving Time and Ground-level Ozone" (Appendix C-3).
- August 12, 2006: "MPO Wants Input on Mobility Plan" (Appendix C-9).
- September 28, 2006: "Celebrate Winchester at Opportunity Festival" (Appendix C-11).
- October 2, 2006: "Festival Spotlights Nonprofits and Local Government" (Appendix C-12)
- October 6, 2006: "Green Circle Fitness Fair Planned" (Appendix C-14).
- October 24, 2006: "Air Quality Tower, Information Kiosk Dedicated in Clarke" (Appendix C-20)
- November 14, 2006: "Citizens Give Ideas on Paths: MPO continues work on bike and pedestrian needs" (Appendix C-24).

Other related articles and press releases from various media resources, include

- May 20, 2006: "Valley AIRNow Pushing Air Quality" (*Northern Virginia Daily*; Appendix C-6).
- June 12, 2006: "Teachers Span The GLOBE – Educators to Attend Sessions that Emphasize Air Quality" (*Daily News Record*; Appendix C-7).
- August 4, 2006: "14 Communities Continue Early Smog Reductions" (EPA press release; Appendix C-8).
- October 12, 2006: "Students Fuel Up on Science" (NBC 29; Appendix C-15)
- October 13, 2006: "Middle and High Schoolers Discover Alternative Fuels" (*Daily News Record*; Appendix C-16).
- October 19, 2006: Towering Achievement: Data Collection to Take a Measure of Valley Air (James Madison University press release; Appendix C-18).
- October 24, 2006: "A Towering Achievement" (*Daily News Record*; Appendix C-22).

- November 15, 2006: "Training Teachers to Teach" (James Madison University Newsroom; http://www.jmu.edu/news/TheNewsroom/college_ISAT.shtml and Appendix C-26).
- November 27, 2006: "Early Smog Reductions in 14 U.S. Communities" (EPA press release; Appendix C-27).

News Coverage (RADIO): September 2006

WINC FM, a popular radio station serving the Winchester-Frederick County area, interviewed Dan Salkovitz of the Virginia Department of Environmental Quality regarding the ending of Ozone Season 2006.

News Coverage (TELEVISION): Ongoing 2006

NBC-29 covered the National Alternative Fuel Vehicle Day Odyssey events at James Madison University on October 12, 2006. Valley AIRNow staffed an air-quality learning station through which hundreds of area students circulated. Two separate news clips can be viewed by visiting the following link: <http://www.valleyairnow.com/MediaCenter.htm>.

Public Service Announcements (RADIO): Ozone Season 2006

During the period of July to September, Valley AIRNow released a variety of week-long, live-read and prerecorded public service announcements to popular area radio stations. The live-read announcements can be found in Appendix D. Valley AIRNow partnered with the American Lung Association of Virginia and the Department of Environmental Quality's Office of Environmental Education through its Clean Air Champions program to deliver a series of three prerecorded announcements. These announcements were released the weeks of August 7, August 14, and September 4, 2006, to promote proper tire maintenance.

Public Service Announcements (TELEVISION): Ozone Season 2006

Valley AIRNow partnered with the Federal Highway Administration's *It All Adds Up to Cleaner Air* initiative to release a week-long public service announcement on two local television stations—WAZT-TV and Winchester Community Television. The announcement aired from July 24 to July 31, 2006.

Air Quality Action Day Program: Maintained and Expanded Ozone Season 2006

The Air-Quality Action Day Program (AQAD) is a five-dimension network created by Valley AIRNow in 2005. The five separate groups in this network that are alerted of an Air-Quality Action Day are business (Valley AIRCorps program), educators, government, health, and media. If enacted, the Air-Quality Action Day Program protocol is as follows. When the Virginia Department of Environmental Quality forecasts ozone levels for the next day to reach the Code Orange level or higher, the Valley AIRNow team alerts the AQAD Network by sending an email or fax press release (Appendix E). The community and general public are then alerted mainly through the media, business, and health dimensions. Local newspapers run stories, while area radio stations run public service announcements. Businesses, health-care providers, and local government offices share the alert with all employees and—if applicable—customers, by displaying informative posters in high-visibility areas, offering incentives for participation in emissions-reduction activities, displaying the AQAD Alert on their message boards, etc.

The Air-Quality Action Day Program for the 2006 Ozone Season was suspended on September 30 to be reactivated in May of 2007. At this time, a sixth dimension of the AQAD Network is to be added for area members of the freight industry. This dimension is to be called the Clean Diesel Network (CDN) and applies to fleets, truck stops, and rest areas within the Winchester-Frederick County area. By enrolling in the CDN, members agree to educate employees and/or customers of better engine management practices (i.e., reduced idling), particularly on Action Days.

Expanded Ozone Forecasting (INTERNET): Ozone Season 2006

Since 2005, Winchester City and Frederick County air-quality forecasts have been made available through several notification systems—the Virginia Department of Environmental Quality’s daily air-quality forecast and the American Lung Association’s Smog Alert systems. Links for the general public to join these notification systems were made available from May to September at the Valley AIRNow Web site by following our “Current Air Quality” navigation bar (<http://www.valleyairnow.com/currentairquality.html>). Winchester-Frederick County residents were also given the option to contact us at info@valleyairnow.com to join our Air-Quality Action Day email list and receive alerts on Code Orange days or higher.

In addition, real-time ozone data for Winchester-Frederick County were available during Ozone Season 2006 from the following sources. Updated links and information to these sources are included in the Valley AIRNow Web site at <http://www.valleyairnow.com/currentairquality.html>.

- Hourly ozone levels measured daily from the Frederick County ozone monitor – VA DEQ: <http://www.deq.virginia.gov/airquality/510690010.html>.
- Current air-quality conditions for Virginia and two-day forecasts by region – VA DEQ: <http://www.deq.state.va.us/airquality>.
- Current air-quality conditions and one-day forecast for Winchester – EPA AIRNow: <http://cfpub.epa.gov/airnow/index.cfm?action=airnow.showlocal&cityid=376>.
- Current air-quality conditions and one-day forecast for the Mid-Atlantic Region, including Winchester – The Weather Channel: http://www.weather.com/outlook/health/airquality/?state=VA&from=36hr_outlet_aq.
- Current air-quality conditions and four-day forecasts for Winchester – Weather Underground: <http://www.wunderground.com/US/VA/Winchester.html>.
- Regional (Northeast) current air-quality map – Weather Underground: <http://www.wunderground.com/US/Region/Northeast/AirQuality.html>.
- Animated ozone-AQI map for Virginia/North Carolina – EPA AIRNow: <http://www.airnow.gov/index.cfm?action=airnow.showmap>.
- Air-quality hotline for Winchester-Frederick County – Valley AIRNow: (540) 450-2207.
- Air-quality hotline – VA DEQ: (804) 698-4444.

Expanded Ozone Forecasting (TELEVISION): Ozone Season 2006

On WAZT-TV, a Christian television network serving the entire Shenandoah Valley, ozone forecasts for Winchester-Frederick County were integrated into a local cutaway that aired five evenings a week during a program entitled “CBN Newscast”. Additionally, The Weather Channel agreed to display the words “Valley AIRNow Air Quality Outreach Program” on their “Local on the 8’s” segment in the case of a forecasted Action Day.

In late 2006, a new television news station will begin airing in Winchester-Frederick County—TV-3 Winchester. Valley AIRNow is hoping to work with the TV-3 Winchester meteorologists to incorporate air-quality forecasts and animated ozone maps into their daily weather segments.

Expanded Ozone Forecasting (PRINT): Ozone Season 2006

The Winchester Star, a popular local newspaper, published air-quality forecasts and information in their daily edition.

Materials Development, Adaptation, and Revision: Ongoing 2006

Valley AIRNow will continue to adapt and revise existing air-quality materials as needed for Winchester-Frederick County businesses, government, schools, media resources, health-care providers, and community members. This includes Valley AIRNow posters, brochures, memorandums, public service announcements, as well as air-quality curriculum for both public and private schools (Appendix F).

In addition to existing materials, new air-quality materials will be developed on an ongoing basis. Recent material development for 2006 includes:

For media: Media kits were developed that contained the following basic materials: Valley AIRNow Air-Quality Action Day and AIRCorps brochures, informational EPA ozone brochures, American Lung Association pamphlets, Air-Quality Index guides, an air-quality forecasting press release, and an air-quality novelty item. Other resource-specific materials were included in kits for meteorologists and news reporters. These media kits were distributed throughout the 2006 ozone season.

Additionally, a letter endorsed by the Winchester-Frederick County Chamber of Commerce (Appendix F-1) was created to promote the AIRCorps program. Starting in September, this letter was faxed to all Chamber partners.

For schools: In June, an informational brochure advertising the Teacher Air Quality Workshop at James Madison University was created and distributed to Winchester City and Frederick County teachers (Appendix F-2). A draft document outlining the correlations between GLOBE atmosphere investigations and Virginia Standards of Learning (Appendix F-4) was also developed as a result of this workshop.

Additional materials were developed in the fall for the School Idle-Reduction program. Materials included: two 12" x 18" metal anti-idling signs to be placed in parent pick-up zones (Appendix F-8 – F-9), a bumper sticker to be handed out to parents and teachers by school environmental clubs (Appendix F-10), and a campaign kick-off letter to parents explaining the Idle-Reduction program (Appendix F-13).

For general public: Educational Valley AIRNow bookmarks (Appendix F-15) were inserted in approximately 100 packets, which were handed out to all participants in the 3rd Annual Green Circle Fall Fitness Fair. The purpose of these bookmarks was to explain the adverse health effects associated with ground-level ozone on runners.

Valley AIRNow partnered with the Federal Highway Administration's *It All Adds Up to Cleaner Air* initiative to personalize their "10 Simple Steps to Improving Air Quality" bookmark (Appendix F-17). The Valley AIRNow logo was inserted, and the bookmark was distributed to the public at local events.

Valley AIRNow also developed a draft document listing outstanding on-line air-quality resources (Appendix F-18). This informational document contained resources relevant to all audiences, including the general public, educators, kids, and young adults.

For business and health: A large poster was created for the advertisement and recruitment of our business outreach program, Valley AIRCorps (Appendix F-20). The magnetic nature of this poster allows for easy manipulation of company names from one membership level to another. In addition, Valley AIRNow continues to work with each business that signs up for the AIRCorps program to personalize posters with the activities a particular business is adopting to help preserve the air on Air-Quality Action Days (Appendix F-21). These posters are to be displayed during Ozone Season, particularly on Air-Quality Action Days.

Materials from the EPA AIRNow Web site were adapted in June to create posters for display in heavily trafficked areas of local businesses to serve as educational tools for employees and/or customers. These posters included a large visual display of the Air-Quality Index (Appendix F-22) and a *Health Effects of Common Air Pollutants* poster (Appendix F-23) for display in medical offices, retirement homes, wellness centers, and other health care provider locations. These posters continue to be provided to members upon enrollment in the AIRCorps program.

In the fall, a variety of materials were developed for the Clean Diesel Network (CDN)—the Air-Quality Action Day program for the Winchester-Frederick County freight industry. These materials were developed to help educate members of the freight industry on better engine management practices (i.e., reduced idling) and the monetary and environmental savings that result. First, a brochure was created that is specific to diesel-engine idling in the Shenandoah Valley (Appendix F-6). This brochure is to be provided to all CDN members, fleet owners and managers, tractor-trailer drivers, area truck-stop facilities, and local rest areas. Second, a bumper sticker (Appendix F-10) was developed for CDN fleet members to promote their participation in the program by displaying the sticker on all fleet trucks. Third, a 12" x 18" metal anti-idling sign was created (Appendix F-8). This sign is to be placed in designated parking spaces at local truck stops, fleet facilities, or rest areas to encourage drivers to turn off their engines.

Other CDN materials that were developed include a tip sheet and poster. Each document lists 10 ways that the freight industry can improve air quality while reducing fuel and maintenance costs. The tip sheet (Appendix F-12) is magnetized for drivers to use on cab appliances but may be removed to use as a bookmark instead. The poster (Appendix F-11) was created as an educational tool to be displayed in various locations around local fleet facilities, truck stops, and rest areas.

Ozone Season 2005 Outreach Surveys: Analysis Made Available to Public July 2006

Lord Fairfax Community College was subcontracted by Valley AIRNow to complete and compile data from phone surveys on Winchester City and Frederick County residents in order to measure the success of Valley AIRNow's ozone education and outreach program. Two surveys were administered—a pre-ozone season survey lasting from May to June 2005 and a post-ozone season survey performed in November of the same year. The analysis of the pre- and post-ozone season surveys was completed in April and posted on the Valley AIRNow Web site for public access in July.

Three important conclusions were made from the analysis of the survey data. First, the Winchester-Frederick County population has a general knowledge about ozone, but it lacks specificity in its knowledge. Second, the population is amenable to ozone education, but the message must be delivered more effectively. Third, although television is the preferred medium, most of the respondents' knowledge of air quality comes from the newspaper. Valley AIRNow would benefit from developing a stronger presence and relationship with television news outlets, while concurrently improving its presence in *The Winchester Star*, the local newspaper.

In addition to these conclusions, it was found from the post-ozone season survey that approximately 17% of those polled changed their driving habits in some way (e.g., trip chaining, refueling after dark) as a result of what they had learned about air quality during the 2005 ozone season. The final analysis and results from the surveys can be found in Appendix G.

Conferences and Presentations: Ongoing 2006

Valley AIRNow began seeking out and presenting to various groups, organizations, and conferences in 2006. These presentations, along with a brief description of each, are listed below.

- September 7, 2006: Valley AIRNow participated in a Commute Smart Virginia teleconference coordinated by the American Lung Association of Virginia. A presentation was given to attending members on the development of the I-81 Idle Reduction Program.
- September 19 – 20, 2006: Valley AIRNow attended the 2006 Virginia Naturally Conference for Environmental Educators at Smith Mountain Lake, Virginia. On Day Two of the Conference, Valley AIRNow held an informational air-quality session, titled "Road

Trip to Cleaner Air.” Participants of the session were provided with a brief introduction to the science surrounding air quality, air pollution impacts on human health and natural resources in Virginia, and individual actions that make a difference in improving the quality of our air. Information on this conference, including the program of events, can be found in Appendix H.

- October 12, 2006: SHENAIR and Valley AIRNow presented to hundreds of area students in grades 5 – 12 for National Alternative Fuel Vehicle Day Odyssey. Students were provided with an overview of air quality in Virginia and participated in several interactive stations to educate them on actions they can take as individuals to improve the air we breathe. For additional information on this event, refer to Appendix I.

Additional presentations are tentatively planned for 2007 at the following conferences:

- January 14 – 18, 2007: 87th American Meteorological Society Annual Meeting in San Antonio, Texas. SHENAIR will give a poster presentation displaying abstracts from the “Climate and Air Quality in the Shenandoah Valley” workshop (Appendix F-2) held in June 2006 at James Madison University. These abstracts were developed by Valley teachers who creatively formulated ways to implement air-quality information into classroom instruction.
- February 11 – 14, 2007: National Air Quality Conference in Orlando, Florida. In November, Valley AIRNow submitted an application and abstract (Appendix J) for a poster presentation, entitled “Assessment of air-quality outreach effectiveness in rural schools: Pilot test results from the Shenandoah Valley, Virginia’s Valley AIRNow study.” A previous Valley AIRNow survey of 39 air-quality outreach programs across the United States revealed that a majority of programs rely primarily on the completion of short-term milestones as indicators of the effectiveness of that outreach. Quantitative assessment of the effectiveness of outreach, particularly as it relates to grades K-12, was not reported in any of the surveys. Consequently, Valley AIRNow piloted a method that both qualitatively and quantitatively assessed the effectiveness of our K-12 outreach program. In particular, the outreach provided at the Air Quality Station on National Alternative Fuel Vehicle Day Odyssey, was analyzed. Formal application acceptance for this presentation is currently pending.

3rd Annual Opportunity Winchester Street Festival & All-America City Community Celebration: September 30, 2006

Valley AIRNow and the Northern Shenandoah Valley Regional Commission’s Rideshare program shared a booth at the Opportunity Winchester Street Festival—an event to highlight nonprofit organizations and local government. Throughout the day, educational ozone materials were distributed to the public, and residents were given the opportunity to pose any questions regarding local air quality to booth staff. Additional information on this event can be found in Appendix K.

3rd Annual Green Circle Fall Fitness Fair: October 7, 2006

On October 7, the 3rd Annual Green Circle Fall Fitness Fair took place in Winchester. This event included an adult 5K and a kids’ 1-mile race that showcased the existing Green Circle trail—a walking and biking path that, upon completion, will provide a safe means of alternative transportation to various locations throughout the city. For the event, Valley AIRNow inserted educational ozone bookmarks (Appendix F-13) in approximately 100 Runner’s Packets. These packets were then provided to each runner for their participation in the event. Additional information regarding the races can be viewed by visiting the Winchester Green Circle Web site at <http://www.winchestergreencircle.com/>.

Regional Transportation Summit: October 18, 2006

The Winchester-Frederick County Chamber of Commerce hosted a Regional Transportation Summit to address traffic congestion in the area. A panel of business leaders was asked to

present its ideas and comments on the area's strained transportation network. Particular issues in the region that were discussed included high-volume traffic and gridlock on I-81, at the I-81 interchange at Stephenson, Routes 7 and 50, as well as Fairfax Street in Stephens City.

School-based Public Awareness Program

Educators Air Quality Action Day Program: Maintained Ozone Season 2006

Winchester City Public Schools and Frederick County Public Schools again participated in the Air Quality Action Day program for the 2006 ozone season. Each school system supported a designated clean air coordinator who was responsible for receiving and disseminating any Action Day Alerts (Appendix E-3) throughout the schools.

Clean Air Champions Program: Ongoing Development

Also during the series of meetings held with Frederick County Public Schools, the possibility of implementing the Clean Air Champions program in high school Driver's Education classes was explored. Clean Air Champions is a statewide campaign led by the VDEQ Office of Environmental Education and the American Lung Association of Virginia. The purpose of the program is to educate motorists, particularly new drivers, about the benefits of improving air quality by reducing fuel consumption and ozone generation through proper car maintenance.

The Clean Air Champion's Driver's Education curriculum would consist of a canned PowerPoint presentation (Appendix L) that Valley AIRNow would deliver to students. The presentation would be supplemented with several interactive activities dispersed throughout the class period. These activities would include a stationary bicycle in which students could experience the resistance associated with increases and decreases in tire pressure, and practice tires to learn the correct way to measure tires at home using a pressure gauge.

GLOBE Equipment in K – 12 Classrooms: Ongoing 2006

GLOBE (Global Learning and Observations to Benefit the Environment) is a worldwide hands-on, primary and secondary school-based education and science program. For students, GLOBE provides the opportunity to learn by:

- Taking scientifically valid measurements in the fields of atmosphere, hydrology, soils, and land cover/phenology;
- Reporting their data through the Internet;
- Publishing their research projects based on GLOBE data and protocols;
- Creating maps and graphs on the free interactive Web site to analyze data sets;
- Collaborating with scientists and other GLOBE students around the world.

SHENAIR provided two Frederick County schools—Admiral Richard E. Byrd Middle and Northwestern Regional Education Programs (NREP)—with a set of certified GLOBE Surface Ozone equipment for classroom implementation. The equipment will provide students with an opportunity to collect surface ozone, cloud cover, relative humidity, min/max/current temperature, and wind data. These data can then be entered into the GLOBE on-line database, and local atmospheric trends can be viewed over time.

To view school information and data for Admiral Richard E. Byrd Middle, visit the following link: <http://viz.globe.gov/viz-bin/info.cgi?&rg=n&l=en&b=g&enc=00&nav=1&s=j9sNKQP&e=>. To view school information and data for Northwestern Regional Education Programs, visit <http://viz.globe.gov/viz-bin/info.cgi?&rg=n&l=en&b=g&enc=00&nav=1&s=i3SUKb8&e=>.

GLOBE Train The Trainer Workshop: November 13 – 14, 2006

In November, SHENAIR and Valley AIRNow staff participated in an intensive, two-day GLOBE Train The Trainer (TTT) Workshop held at James Madison University. Staff members were formally trained on the Surface Ozone Protocol (Appendix M) as well as other supplementary protocols in the areas of atmosphere, hydrology, soils, and land cover. Workshop sessions consisted of both lecture and field work. GLOBE instruments, such as a turbidity tube, densiometer, and clinometer, were constructed. As a result of this workshop, Valley AIRNow staff is certified to train K–12 teachers to become GLOBE educators.

Idle Reduction Program: Ongoing Development

In October, a series of meetings was held with the superintendent and assistant superintendents of Frederick County public schools. During these meetings, the possibility of implementing an idle-reduction program was reviewed. The program would consist of educating parents, teachers, and students on the health and environmental effects associated with engine idling in school zones. A variety of educational tools were developed to promote the initiative, including idle-reduction street signs and bumper stickers. An estimated 30–50 street signs (Appendix F-9) would be placed in Frederick County school parent pick-up locations to encourage parents to turn off their engines. The bumper sticker (Appendix F-10) would be passed out to parents and teachers by school environmental clubs. Additionally, an introduction to the idle reduction program would be placed in the newsletter of each participating school to kick off the initiative.

The exact locations of the idle-reduction signs are being assessed by the Frederick County Safety Audit team in the winter of 2006-2007. The installation of signs is anticipated to begin prior to ozone season 2007. Valley AIRNow also plans to contact Winchester City Public Schools to implement a similar idle-reduction program within its school system.

National Alternative Fuel Vehicle Day Odyssey: October 12, 2006

National Alternative Fuel Vehicle Day Odyssey, or Odyssey Day, is a nationwide event that was held in multiple locations across the United States on October 12. Although Odyssey Day is typically an event to showcase alternative transportation technologies, James Madison University (JMU) was the only location to extend the event to encompass all areas of sustainability—including air quality, water quality, wind energy, green-roof technology, and more! Area students from grades 5–12 attended Odyssey Day and visited each of the sustainable areas stationed around the JMU campus. Two schools from the Frederick County school system, Millbrook High and Sherando High, participated in the event.

Valley AIRNow and SHENAIR staffed the Air Quality Station, which consisted of two interactive exhibits. The first was a Learning Resources exhibit which highlighted GLOBE (Global Learning and Observations to Benefit the Environment) air-quality monitoring equipment and an interactive ozone simulation game called Smog City (<http://www.smogcity.com>). The second exhibit, called the “What YOU Can Do” station, promoted proper tire maintenance as a simple step to improve air quality. This exhibit featured 1) a cubic meter model to show students what ozone might look like and how much ozone they may breathe during various outdoor activities (Figure 1a), 2) a stationary bicycle for students to experience the resistance associated with increases and decreases in tire pressure (Figure 1b), and 3) practice tires and pressure gauges for students to learn the proper technique for checking their own tire pressure (Figure 1c).

Additional information on National Alternative Fuel Vehicle Day Odyssey 2006 can be viewed at <http://www.nationalafvdayodyssey.org/>. Further details on the JMU Odyssey Day event can be found in Appendix I, and media coverage of the event can be found in Appendix C or on the Valley AIRNow homepage.



a)



b)



c)

Figure 1. National Alternative Fuel Vehicle Day Odyssey, Air Quality stations: a) m^3 model; b) vehicle simulator; c) tire-pressure measurement

Smog Dog: Ongoing 2006

Smog Dog (Figure 2a), the Valley AIRNow program mascot, continues to be used at events as an educational, public outreach tool for kids. The mascot proved to be very popular with students of all ages at National Alternative Fuel Vehicle Day Odyssey 2006 (Figure 2b).



a)



b)

Figure 2. Smog Dog: a) Valley AIRNow mascot; b) posing with students during National Alternative Fuel Vehicle Day Odyssey.

Employer-based Ozone Action Days/Ozone Action Days for Area Sources

Valley AIRCorps program: Ongoing 2006

Valley AIRCorps is the Business Outreach and Promotions Program of the Northern Shenandoah Valley Ozone Early Action Plan. Valley AIRCorps is a no-cost program that seeks to create, nurture and promote clean air partnerships with businesses in the Northern Shenandoah Valley. The program spreads the word about our air-quality challenges and provides valuable public health networking.

The center of the AIRCorps program is membership in the Air Quality Action Day Network (AQAD)—a network to inform the community of health risks on Code Orange Action Days or higher, and to take simple steps to reduce smog-inducing emissions. Businesses appoint a Clean Air Coordinator (CAC) who subscribes to the AQAD email or fax notification system. Valley AIRNow sends out a media release (Appendix E) to each CAC when ozone levels are predicted to be Code Orange or higher. In return, each AIRCorps member agrees to disseminate the AQAD information to all employees and/or customers. This informational dispersion may take the form of one or more of the following methods: email notification to all employees, a media release or AQAD poster (Appendix F-21) displayed on employee message boards, personalized AQAD poster displayed in heavily trafficked areas (e.g., waiting rooms, lobbies, store windows, checkout registers, etc.), verbal announcements to employees and/or customers throughout the day. Additional methods of AQAD dissemination continue to be explored with AIRCorps Clean Air Coordinators.

As of December 2006, 27 Winchester-Frederick County businesses have enlisted in the Valley AIRCorps program to receive Air Quality Action Day alerts. A current list of these businesses can be viewed on the Valley AIRNow Web site at <http://www.valleyairnow.com/aircorpsmembers.htm>.

AIRCorps Program Recruitment Campaign: Ongoing 2006 – 2007

Valley AIRNow continued to recruit new members for the AIRCorps program and AQAD network throughout 2006. Partnering with the Winchester-Frederick County Chamber of Commerce, Valley AIRNow faxed a recruitment letter (Appendix F-1) to hundreds of Chamber members. The letter explained the AIRCorps program and encouraged businesses to register on-line at <http://www.valleyairnow.com/aircorpsregistration.htm>. The letter will continue to be faxed until all 1,200 Chamber members are reached.

Additional forms of recruitment for the AIRCorps and AQAD network will continue into 2007.

Clean Diesel Network: Ongoing Development

A sixth dimension of the Air Quality Action Day Network was developed this year and is referred to as the Clean Diesel Network (CDN). The CDN was created due to the recent increase in traffic on Interstate-81. I-81 serves as one of the most important transportation corridors on the East Coast and is the route for a large majority of the truck traffic in the Shenandoah Valley. Although this interstate traffic is essential to the economic vitality of the Valley, there is increasing concern about the health and environmental effects associated with diesel engine exhaust.

The Clean Diesel Network will be specific to all Winchester-Frederick County members of the freight industry, including fleet and trucking companies, truck stops, and rest areas. By enrolling in the CDN, members agree to educate employees and/or customers about better engine management practices (i.e., reduced idling), particularly on ozone Action Days. When an Action Day is predicted, the designated Clean Air Coordinator will receive a press release (Appendix E-6) explaining the health risks involved and the steps each business can take to reduce emissions for that day.

Other membership benefits that CDN members will enjoy include:

- Publicity on the Valley AIRNow Web site. A list of participating members can be viewed by visiting <http://www.valleyairnow.com/cdnmembers.htm>.
- Publicity at local events. CDN members, along with AIRCorps members, will be recognized at all Winchester-Frederick County events in which Valley AIRNow participates.
- Recognition in local media resources. Upon kicking off the Clean Diesel Network in 2007, Valley AIRNow will promote those participating through newspaper articles, press releases, and other media outlets.
- Educational materials. Valley AIRNow will provide members with a poster (Appendix F-11) to display around the business facility and a bookmark (Appendix F-12) that outlines 10 simple steps to improve air quality while reducing fuel and maintenance costs. Each member will also be given a brochure (Appendix F-6) that is specific to diesel engine idling in the Shenandoah Valley. The brochure outlines air pollution in the area and its relationship to vehicle idling, why the freight industry should be concerned, and what can be done.
- Bumper stickers. CDN members will be supplied with bumper stickers (Appendix F-10) to place on fleet trucks advertising their participation and dedication to improving air quality in the Valley.
- Idle reduction street signs. For those CDN businesses that may be interested, Valley AIRNow will post signs (Appendix F-8) in truck parking zones to encourage drivers to turn off their engines.
- Annual awards. CDN members will be provided with certificates of appreciation and exemplary service to the community for their participation in the network.

To date, Valley AIRNow is in the recruitment stages of the Clean Diesel Network. The brochure, bookmark, poster, and bumper sticker have been printed and will be presented to members upon enrollment. Member recruitment will extend through ozone season 2007.

For more information on the Clean Diesel Network, visit the Valley AIRNow Web site at <http://www.valleyairnow.com/cleandieselnetwork.htm>. To register for the CDN on-line, potential members may visit <http://www.valleyairnow.com/cdnregistration.htm> or contact Tiffany Tumer at tumerta@jmu.edu.

Dynamic Message Signs

Episodic Ozone Program: Implemented Ozone Season 2006

Virginia Department of Transportation (VDOT) highway variable message signs were activated on June 18 when VA DEQ designated an Air Quality Action Day. On this day, the message signs displayed the words "Air Action Day" to inform motorists of potential 8-hour ozone exceedances.

VDOT currently operates two variable message signs in Northern Shenandoah Valley at the following locations:

1. I-81 Northbound, mile marker 287.5 (#17, Figure 3), and
2. I-81 Southbound, mile marker 323.1 (#18, Figure 3).

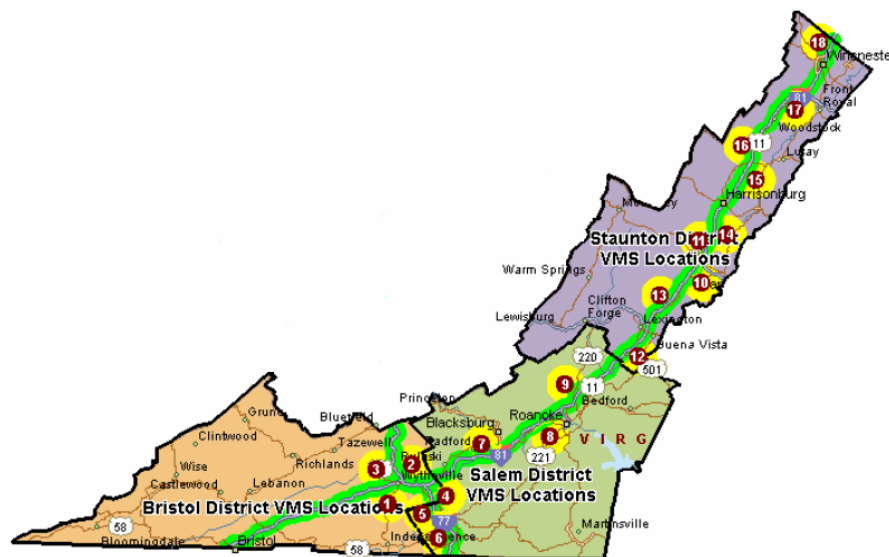


Figure 3. VDOT variable message sign locations for Bristol, Salem, and Staunton Districts.
(Source: Virginia Department of Transportation)

Video Monitor System Deployment

Public Availability of Traffic and Visibility Web Cameras: Expanded 2006

Visibility and traffic webcams are made available to the public on the Valley AIRNow homepage year round. In 2004, VDOT initiated a closed circuit television (CCTV) pilot by placing various models of IP-addressable cameras (Figure 4) at several positions along the I-81 corridor at New Market, Strasburg, and Woodstock. In 2006, VDOT expanded the project and installed approximately 30 additional IP-addressable cameras throughout the District along I-81, I-64, and I-66. Current I-81 locations for cameras in the Northern Shenandoah Valley area are listed in Table 1 below. A link to these webcams, as well as a visibility camera overlooking the Potomac River in Washington, D.C., is also available on the Valley AIRNow homepage.



Figure 4. IP-addressable camera overlooking Interstate 81.
(Source: Virginia Department of Transportation, Smart Traffic Center)

Table 1. Locations of VDOT traffic cameras in the Northern Shenandoah Valley.

(Source: Virginia Department of Transportation, Smart Traffic Center)

Camera Location	Mile Post
New Market	I-81, Exit 264
Mount Jackson	I-81, Exit 273
Woodstock	I-81, Exit 283
Toms Brook	I-81, Exit 291
Strasburg	I-81, Exit 298
Strasburg	I-81, Exit 300 (westerly view)
Strasburg	I-81, Exit 300 (southerly view)
Middletown	I-81, Exit 302
Stephens City	I-81, Exit 307
South Winchester	I-81, Exit 310
Winchester	I-81, Exit 313
Winchester	I-81, Exit 313
Winchester	I-81, Exit 315
Clearbrook	I-81, Exit 321
WV State Line	I-81, Exit 323
Shenandoah Farms	I-66, Exit 13
Front Royal	I-66, Exit 6
WV State Line	Route 55 West

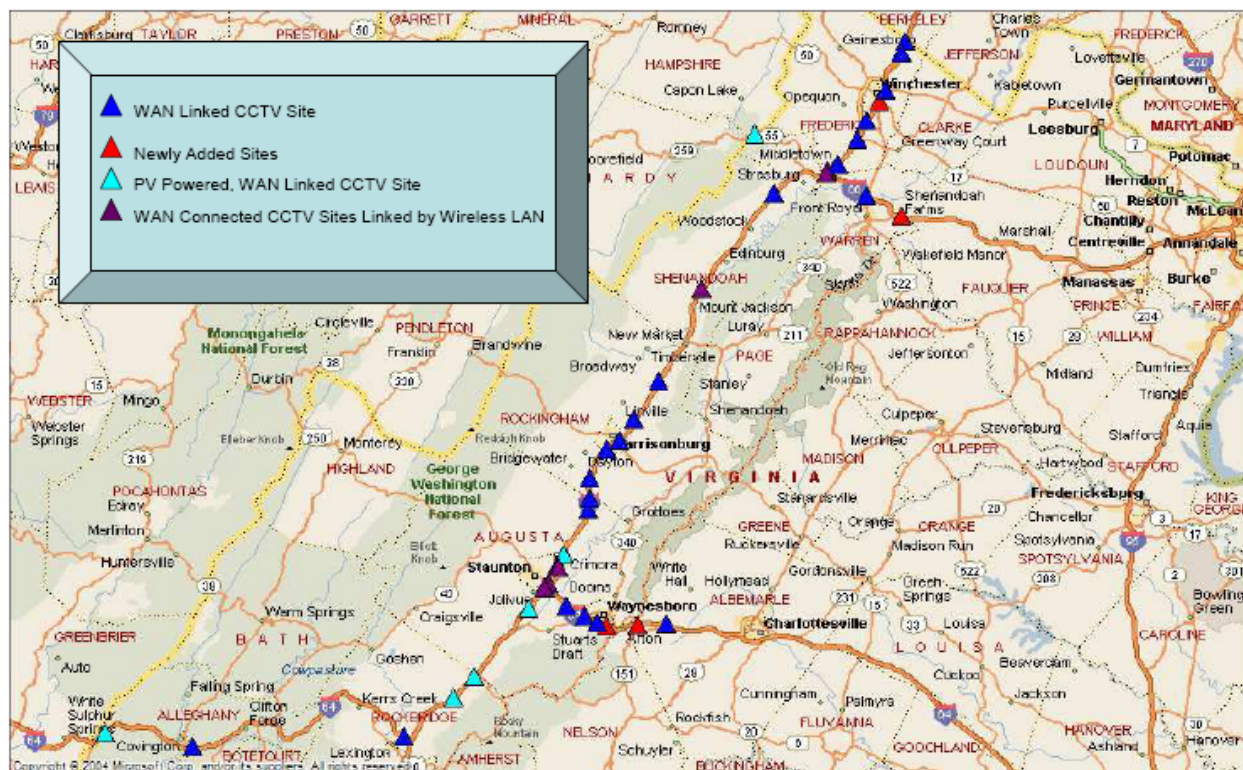


Figure 5. Shenandoah Valley map of IP-addressable traffic camera locations.

(Source: Virginia Department of Transportation, Smart Traffic Center)

Lawn & Garden Equipment Usage Restrictions

Local Government Air Quality Action Day Program: Ozone Season 2006

In June, a memorandum regarding local government actions on Air Quality Action Days was issued by the Winchester city manager and Frederick County administrator to all respective local government agencies and offices. This memorandum, located in Appendix N, specified the postponement of mowing on Air Quality Action Days, which included the use of publicly owned gasoline and diesel powered mowers, weed eaters, and other similar gasoline engines. Other AQAD actions specified in the memorandum included postponement of the use of oil-based paints and solvents, restrictions on engine idling, restrictions on any burning associated with county land clearing and construction, as well as the limitation of prolonged outdoor exertion by government employees.

On June 18, the area's only forecasted Action Day, this memorandum was disseminated to all local government agencies and offices.

VDOT Episodic Ozone Program: Ozone Season 2006

VDOT issued a memorandum (Appendix N-2) for employees that outlined 2006 VDOT actions on Air Quality Action Days. These actions included the following ozone alert procedures:

- Travel reduction;
- Postponement of mowing;
- Fueling restrictions;
- Use of variable message signs;
- Reduction of electricity usage;
- Postponement of painting.

Additionally, VDOT issued a memorandum for employees regarding 2006 VDOT gas restrictions on Air Quality Action Days. This memorandum, located in Appendix N-3, specified that gasoline pumps operated by VDOT in early action compact areas would be closed from 8:30 a.m. to 5:00 p.m. on these days. Travelers needing to refuel state cars in Winchester-Frederick County on Air Quality Action Days are required to do so before 8:30 a.m. or else make other refueling arrangements.

2. VMT Reduction Programs

This strategy combines a number of individual programs/activities designed to reduce vehicle miles of travel (VMT).

Control Strategies:

Enhance/Expand existing Northern Shenandoah Valley Regional Commission (NSVRC) Ridesharing Program

From June to December 2006, the NSVRC, operating through its Valley Commuter Assistance Program (VCAP), has been involved with the following programs and activities to promote ridesharing and improve air quality in the Northern Shenandoah Valley area (Appendix O). For additional information on the Northern Shenandoah Valley Regional Commission's Rideshare Program, visit <http://www.vcapride.virginia.gov/>.

Conferences and Presentations

June 6 – 8, NSVRC staff attended the Virginia TDM/Ridesharing Conference in Chincoteague, VA. Information and ideas were exchanged with other rideshare programs from across the state.

The Association for Commuter Transportation (ACT) International Conference was held August 27 – 30 in Boston, Massachusetts. NSVRC staff attended this conference and presented on a study that was used in the Northern Shenandoah Valley to create additional commuter programs and services for the area.

Media Advertising

In September, Valley Commuter Assistance Program sponsored a series of back-to-school safety messages that were aired on WFTR-FM 93.5. Drivers were urged to be safe and to contact the Rideshare program for additional information.

NSVRC staff recently developed *The Key* Newsletter—an electronic newsletter that is distributed to all persons registered with VCAP. This newsletter provides a wealth of traffic and rideshare information, including where to obtain updated VDOT highway construction alerts, openings in existing vanpool and carpools, and details on commuter bus operations. Refer to Appendix O-5 for the December edition of *The Key*.

NSVRC has currently planned several upcoming media advertisement projects. This winter, VCAP plans to run a media campaign on Adelphia Cable Television. A series of crawl advertisements will play on the Weather Channel early weekday mornings and evenings to promote the commuter bus service. Phone numbers and Web site links to obtain additional information will be provided in the ads as well. VCAP has also reached an agreement with S&W Tours, the company operating the Washington, D.C. commuter bus service, to promote the Valley Commuter Assistance Program by placing large transit ads on the Northern Shenandoah Valley bus. Negotiations are currently underway to display additional transit ads on at least two other S&W buses.

Employer Outreach

In May, NSVRC staff attended an employer work fair at the Westfields Business Park in Fairfax County. The Valley Commuter Assistance Program provided information at this event on the commuter bus service between the Business Park and Northern Shenandoah Valley. In addition, materials explaining alternative methods of transportation (i.e., carpooling, vanpooling and telecommuting) were disseminated. To date, NSVRC continues to communicate with Westfields to determine whether enough demand exists to establish a second commuter bus.

Rideshare Programs

NSVRC created three new vanpools containing 10 to 13 passengers each to serve the Northern Shenandoah Valley area. A new commuter bus service was recently created as well, carrying passengers to the Central Intelligence Agency's Central Office in Fairfax County. Approximately 32 riders currently use this service.

NSVRC also continued to support several private commuter bus services. One is a commuter bus traveling to Westfields Business Park in Fairfax County. Thirty-seven riders currently use this service. The second service is a bus traveling to Washington, D.C. on I-66. To date, ridership totals 22 passengers—up slightly from 20 passengers reported in June. Additionally, NSVRC staff is working to establish a second bus to Washington, D.C. that will operate on a later time schedule than the existing service.

A demonstration grant to be filed in February 2007 with the Virginia Department of Rail & Public Transportation is currently underway. The grant would fund a new shuttle service running between park and ride lots located in the Northern Shenandoah Valley and the Vienna Metro Station in Fairfax County. This proposed service would operate four morning and afternoon runs during the week.

Park and Ride Lots

To date, NSVRC has identified 11 park and ride lots in the Northern Shenandoah Valley area, totaling 1,050 parking spaces available for commuters. A list of these lots is included in Table 2 below. Discussions with VDOT, Clarke County, and Berryville to explore available options for the creation of a park and ride lot within the Town of Berryville continue. Additionally, NSVRC is working with VDOT and Warren County to find ways to increase park and ride lot capacity at the Front Royal and Linden lots. These lots are currently operating at 100% capacity and additional spaces are required.

Table 2. NSVRC Park and Ride Lots in the Northern Shenandoah Valley area.

(Data compiled from <http://www.vcapride.virginia.gov/>)

County	Lot Name	Location	# of Spaces
Clarke	Double Tollgate	US 340 / US 522	17
Clarke	Waterloo	VA 340 at US 50	160
Fauquier	Markham	Rt. 688 & I-66	15
Fauquier	Marshall	Frost Road	75
Fauquier	Remington	VA 651 & US 15 / 29 / 17	16
Fauquier	Warrenton	US 29 / 211 & VA 605	212
Page	Luray	Rt. 340 & Rt. 211 Bypass	103
Page	Shenandoah	Off Rt. 602	30
Shenandoah	Strasburg	Rt. 11	30
Warren	Front Royal	I-66 & US 340 / 522	262
Warren	Linden	I-66 & Rt. 647	130

Although no park and ride lots currently exist within the Winchester-Frederick County MPO area, the 2030 Transportation Plan (refer to Bicycle and Pedestrian Accommodation) includes the development of two future park and ride facilities at

- US Route 522 near Tasker Road (Route 642) and
- Route 7 between I-81 and the Clarke County Line.

On October 26, NSVRC attended the VDOT 6-Year Statewide Transportation Improvement Program public hearing in Verona. NSVRC staff presented testimony and requested the Commonwealth Transportation Board to allocate additional resources to new park and ride lot construction and to the expansion of existing lots in the Northern Shenandoah Valley region.

Rideshare Matching Services

NSVRC continues to provide rideshare matching services to the Northern Shenandoah Valley area. Since June 2006, NSVRC staff received and responded to 125 new matching requests for carpools, vanpools, and commuter bus services as well as 70 renewal requests from existing VCAP members.

Bicycle and Pedestrian Accommodation

Winchester-Frederick County Metropolitan Planning Organization (MPO) Bicycle and Pedestrian Mobility Study

A study to provide a connected and comprehensive network of bicycle and pedestrian facilities in the MPO study area (Winchester-Frederick County Urbanized Area) began in 2005. The goals of the plan are to provide new facilities that will create logical connections to existing facilities; enhance recreational opportunities; improve access to schools, libraries, and other public facilities; and provide an alternative to using a personal automobile.

Toole Design Group, LLC, one of the nation's leading planning and design firms specializing in multi-modal transportation, was hired in 2006 as the consultant for the study. Toole Design has

developed similar projects in the past, including the Maryland Pedestrian and Bicycle Safety Education Program, the District of Columbia Bicycle Master Plan, and the Loudoun County Bicycle and Pedestrian Mobility Master Plan. Additionally, a grant was received from the National Park Service's Rivers, Trails, and Community Assistance Program to provide technical assistance to the MPO Study.

On August 22, Toole Design and the MPO Steering Committee toured the city and county in an effort to educate the consultant on key concerns and corridors in the area. In addition, several important meetings were held by the MPO to discuss future development of the Mobility Study. A stakeholders meeting was held on September 18 followed by a public meeting on November 13 to review the first draft maps of the proposed network.

An on-line survey is currently posted on the Winchester-Frederick County MPO Web site at <http://www.winfredmpo.org/> to gain community feedback that will aid in the development of the Mobility Study. This survey consists of three sections: pedestrian, bicycle, and demography. To date, more than 500 responses have been received. A copy of this survey can be found in Appendix P-1.

The anticipated completion date of the MPO Bike and Pedestrian Mobility Study is spring 2007.

Winchester-Frederick County Metropolitan Planning Organization (MPO) 2030 Transportation Plan

The Winchester-Frederick County MPO 2030 Transportation Program consists of a multi-modal transportation plan that addresses existing and current transportation needs of the Winchester-Frederick County MPO area. Among the many goals and objectives of the plan are:

- Encourage the use of alternate modes of transportation such as bicycle, pedestrian, carpooling and ridesharing, public transit, air, and rail.
- Provide a transportation network that is sensitive to the region's environment.
- Provide land use patterns that maximize the efficiency of the transportation network.

The 2030 Final Transportation Plan is currently available for public access by visiting the MPO website at http://www.winfredmpo.org/transplan_final.asp. A poster overview and map of the Plan is located in Appendix P-9.

Bike and Pedestrian Safety Grant Project Analysis: Ongoing 2006

Earlier this year, Winchester City was awarded a Bike and Pedestrian Safety grant from VDOT. The city is currently involved in negotiations with VDOT to administer the projects locally that would involve the incorporation of pedestrian signals and crosswalks to seven intersections along the Winchester Green Circle route.

Route 11 Corridor Access Management Study

The Northern Shenandoah Valley Regional Commission (NSVRC) and Virginia Department of Transportation (VDOT) are currently involved in a study of the U.S. Route 11 corridor spanning for eight miles from Bellview Avenue in the City of Winchester to south of the Town of Stephens City. The purpose of the study is to assess proposed improvements, policies and regulations that will reduce congestion, safely and efficiently manage access to adjacent properties, and increase roadway capacity, including bicycle and pedestrian transportation. The study is scheduled for completion by August 2007.

Route 11/Route 37/Shady Elm Drive Interchange Study

NSVRC, VDOT, and HNTB, a private consulting firm from Arlington, Virginia, are currently studying a complex interchange configuration located adjacent to Exit 310 of I-81. Due to private development near this area, congestion, accidents, and other traffic problems have increased significantly. The purpose of this study is to assess proposed improvements, policies and

regulations that will reduce congestion, safely and efficiently manage access to adjacent properties, and increase roadway capacity, including bicycle and pedestrian transportation. The MPO Policy Committee appointed a management team composed of two individuals from the city, two from the county, and one from VDOT to lead the procurement effort for this study. The study is scheduled for completion by August 2007.

Transportation District Feasibility Study

The Winchester-Frederick County MPO Policy Committee carried over a Transportation District Feasibility Study from fiscal year 2004-2005. The purpose of this study was to analyze the feasibility of creating a transportation district to facilitate the expansion of mass transportation services outside the City of Winchester. This study led to the development of a Unified Planning Work Program for Fiscal Year 2007 (July 1, 2006 – June 30, 2007).

Virginia Department of Transportation Enhancement Grant

On September 20, the Frederick County Planning Commission unanimously approved the authorization to apply for a Virginia Department of Transportation Enhancement Grant to implement bicycle and pedestrian improvements in the vicinity of Senseny Elementary School (Appendix Q-11). Since then, the county has formally applied for the grant with the intent to construct multi-use asphalt paths along a section of Senseny Road near Senseny Elementary. The results of the application are expected to be received in the spring of 2007.

Walking & Wheeling the Northern Shenandoah Valley Program

The Northern Shenandoah Valley Regional Commission and Shenandoah Valley Battlefield Foundation's Walking & Wheeling Plan was adopted in 2005 and continues to be promoted in 2006 as a source of justification for further bicycle and pedestrian accommodation studies and projects.

James Wood High School Bicycle and Pedestrian Facilities Survey

Frederick County Planning & Development partnered with a Government Service Learning class from James Wood High School to survey county students on their opinions of bicycle and pedestrian facilities in the area. More than 700 surveys were administered, resulting in approximately 500 completed responses. The government students then tabulated the survey results and presented their data to the Frederick County Board of Supervisors.

Promote Green Space Preservation

Frederick County Conservation Easement Authority: Ongoing

The Frederick County Conservation Easement Authority was established to assist county landowners in the protection and preservation of farm land, forests, open space, scenic landscapes, historic sites, water resources, and environmentally sensitive lands. The primary method for accomplishing this mission is for the Authority to facilitate conservation easements.

In 2006, a publicity campaign for the Easement Authority was initiated. The Authority developed informational materials, which included a Frederick County Conservation Easement Authority brochure (Appendix R-1) and application (Appendix R-3). All county landowners retaining 50 or more acres were sent these educational materials to promote and generate interest in the program.

Although no easements have been placed to date, Authority members and county staff continue to welcome any opportunities to meet with landowners and members of the community to discuss land preservation and to provide explanations of how conservation easements work. This winter, Authority members plan to hold an educational training session on the newly implemented tax laws.

For additional information on the Frederick County Conservation Easement Authority, visit <http://www.co.frederick.va.us/PlanningAndDevelopment/ConservationEasementAuthority/>.

Virginia Outdoors Foundation Easement Program: Ongoing

The Virginia Outdoors Foundation (VOF) was created by the General Assembly in 1966. Its purpose is to promote the preservation of open space lands and to encourage private gifts of money, securities, land or other property to preserve the natural, scenic, historic, open-space and recreational areas of the Commonwealth. The primary mechanism for promoting this mission is the open space easement.

On November 15 and 16, VOF held a Policy and Easement Consideration Board meeting in Charlottesville. Potential easement applications were reviewed for dozens of counties across Virginia. The agenda from this meeting is located in Appendix S.

As of November 2006, 14 easements totaling approximately 2,300 acres have been donated to VOF by Winchester City-Frederick County residents. A list of these recorded easements is included in Table 3 below. Additional easements are currently being reviewed, such as a 47-acre lot and a 222-acre lot in Frederick County up for donation by the Potomac Appalachian Trail Club (Appendix S-4).

Table 3. VOF Recorded Easements in Frederick County and City of Winchester
(Data provided by the Virginia Outdoors Foundation)

County	Type	Recorded Date	Acreage
Frederick	Original deed	11/4/1998	1,019.17
Winchester (City)	Original deed	10/23/2000	0
Frederick	Original deed	11/9/2000	222.03
Frederick	Original deed	6/29/2001	135.08
Frederick	Original deed	6/29/2001	15.27
Frederick	Original deed	9/13/2002	142.70
Frederick	Original deed	9/13/2002	10.00
Frederick	Original deed	10/29/2002	183.13
Frederick	Subsequent deed	3/28/2003	108.08
Winchester (City)	Subsequent deed	3/28/2003	115.2659988
Frederick	Original deed	8/28/2003	62.20
Frederick	Original deed	10/4/2006	63.70
Frederick	Original deed	10/10/2006	55.00
Frederick	Original deed	10/24/2006	186.00

For additional information on the Virginia Outdoors Foundation, visit its Web site at <http://www.virginiaoutdoorsfoundation.org/>.

Winchester Green Circle Project: Ongoing 2006

The Winchester Green Circle Project is a walking and biking trail that, once completed, will encircle the city and provide safe alternative transportation methods for the community by connecting parks, neighborhoods, schools, and tourist attractions. In 2005, Phase 1 of the Project was completed by creating a 1-mile trail along Abrams Creek Wetland Preserve (Figure 6). To date, the current focus of the Winchester Green Circle Project is the completion of Phase 1-A—Town Run Linear Park. The City of Winchester recently submitted a proposal to VDOT for funding of this portion of the Green Circle. Town Run Linear Park is a proposed section of trail following Town Run from Pleasant Valley Road to Pall Mall Street to Cecil Street (dashed blue line, Figure 7). This trail would connect Old Town Winchester, Shenandoah University, Jim Barnett Park, Winchester-Frederick County Virginia Conventions and Visitors Bureau, Shawnee Springs Park as well as the future locations of the Shenandoah Valley Discovery Museum and History & Tourism Center.

For additional information on the Winchester Green Circle organization, visit <http://www.winchestergreencircle.com/>.



Figure 6. Phase 1 of the Winchester Green Circle Project.

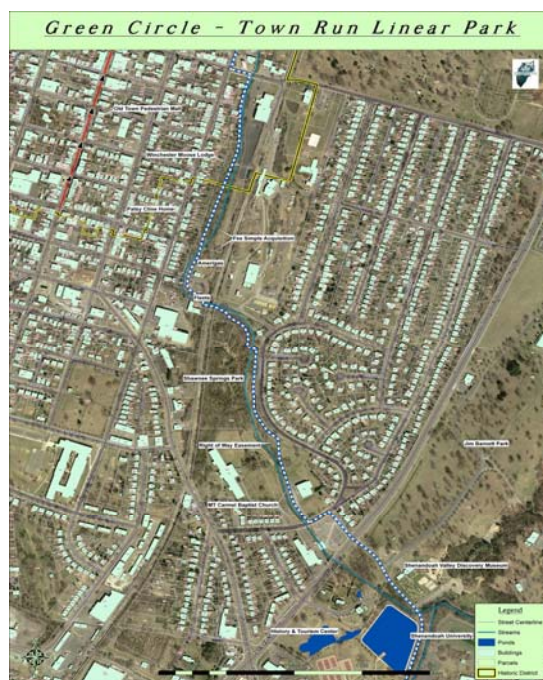


Figure 7. Town Run Linear Park—proposed Phase 1-A trail of the Winchester Green Circle Project.

2007 Virginia Outdoors Plan

The Virginia Outdoors Plan is the Commonwealth's official conservation, outdoor recreation, and open-space plan, which serves as a guide to all levels of government and the private sector in meeting the land conservation, outdoor recreation, and open-space needs of the state. On November 30, the Virginia Department of Conservation and Recreation (DCR) held public meetings to review the draft of the 2007 Virginia Outdoors Plan, focusing on the Northern Shenandoah Valley Regional Commission - Planning District 7 (PD-7).

Preparation of the 2007 plan has been under development this past year, and now the Department of Conservation and Recreation has scheduled public meetings to introduce this coming year's plan and specifically regional sections. Areas discussed in the plan follow boundaries of the Virginia Planning Districts. With this series of meetings, it is DCR's intent to

provide the public with an overview of the VOP, outline draft recommendations for regions, receive comments on these recommendations, and solicit any comments or ideas for land conservation efforts in the area.

The 2007 edition of the Virginia Outdoors Plan will be the 9th produced in Virginia in accordance with § 10.1-200 of the Code of Virginia. In addition, the plan serves as a guidance document for the protection of lands through actions of the Virginia Land Conservation Foundation (VLCF).

Draft 2007 Virginia Outdoors Plan documents can be viewed by visiting the DCR Web site at <http://www.dcr.virginia.gov/prr/vop.htm#drfts>. Regional analysis and recommendations for the Northern Shenandoah Valley Planning District are not yet available. Refer to Appendix T for a copy of the 2002 PD-7 Virginia Outdoors Plan.

Balanced Growth Cities Conference: October 19, 2006

The Northern Shenandoah Valley Regional Commission and Warren County Board of Supervisors hosted a Balanced Growth Counties Conference entitled, "The Challenges: Preserving the Valley's Agricultural and Open Space Heritage and Meeting the Service Needs of New Development."

Promote Mixed Use Development

City and County Comprehensive Plans

Comprehensive plans for the City of Winchester and Frederick County include provisions for promoting mixed use and cluster development.

Frederick County Urban Development Area Study: Ongoing

The purpose of the Urban Development Area (UDA) Study is to address the needs of the urbanizing areas of Frederick County while assuring a sustainable community and maintaining a high quality of life for all Frederick County community members. A UDA Study fact sheet is included in Appendix U-1.

In 2006, the UDA working group of the Comprehensive Plans and Programs Subcommittee evaluated the land use policy within the existing Comprehensive Plan. Revisions to the county land use policy (Appendix U-4) were then proposed. The UDA policy will promote a new form of development—neighborhood mixed use urban community centers. Mixed use urban community centers is a new philosophy of development that creates neighborhoods that incorporate residential, retail, educational, and public uses; commercial services; the opportunity for employment; and institutional and recreational resources.

To date, this land use policy proposal has been endorsed by the Frederick County Planning Commission and awaits discussion by the County Board of Supervisors in December. For additional information on the Frederick County UDA study, visit <http://www.co.frederick.va.us/PlanningAndDevelopment/UDA/Basic%20Information.htm>.

The Villages at Artrip Mixed Use Project: Approved November 2006

On November 8, 2006 the Frederick County Board of Supervisors approved the Villages at Artrip mixed use project. This project advances many of the positive attributes of mixed use communities including increased density, a variety of commercial and housing opportunities, and pedestrian accommodations. The Villages at Artrip will enable the mixed use development of 793 residential units and retail, restaurant, office, and public uses on approximately 170 acres.

Orrick Commons Mixed Use Project: Ongoing

Orrick Commons is a mixed use project of retail and residential uses to be located off of Senseny Road in Frederick County. The residential component is set to be age restricted. Development of Orrick Commons is currently underway with construction to be completed in 2007.

Promote Telecommuting

Episodic Ozone Programs: Ozone Season 2006

Each Air Quality Action Day Network member (i.e. business, government, educators, media, and community) is encouraged to promote telecommuting, especially on Air Quality Action Days.

NetTech Center of Winchester

The NetTech Center of Winchester is a member of the Valley AIRCorps program and the Air Quality Action Day network. The center offers many amenities and technology services, including broadband internet connectivity; desktop video-conference services; affordable set-up; overflow capacity; real-time remote employee access; Smart Digital telephone system with voicemail; and access to fax machines, printers, copiers, and shredders.

Using The Telework Coalition on-line calculator (<http://www.telcoa.org/id134.htm>), the NetTech Center reports the following statistics for 2006:

- Total round trip miles saved per year: 1,237.
- Total emissions lbs saved per year: 105,455.
- Total gallons of gasoline saved per year: 5,168.

The NetTech Center also offers a free trial for federal employees at specific times throughout the year. For more information on the center, visit <http://www.nettechcenter.net/>.

3. Open Burning Restrictions

Establishing open burning restrictions for land clearing activities has the potential to reduce combustion sources in the emissions inventories. While this type of rule is sometimes difficult to enforce, the reduction of related fire hazards, along with the reduction of visible smoke and the resulting air-quality benefits were deemed important by the Northern Shenandoah Valley Task Force. This measure will be implemented by local ordinances.

Control Strategies:

City and County Restrictions: Ozone Season 2006

In June, a memorandum (Appendix N-1) regarding Frederick County local government actions on Air Quality Action Days was issued by the county administrator to all government agencies and offices. This memorandum specified the restrictions of any burning associated with county land clearing and construction projects on AQAD. Other AQAD actions specified in the memorandum included postponement of mowing and the use of oil-based paints and solvents, restrictions on engine idling, as well as the limitation of prolonged outdoor exertion by government employees.

Winchester City code prohibits open burning within city limits.

On June 18, the area's only forecasted Action Day, this memorandum was disseminated to all local government agencies and offices.

4. Engine Idling Restrictions

Due in part to the nearby, heavily traveled I-81 corridor, restrictions for engine idling is another control strategy for the Northern Shenandoah Valley area. A large amount of idling emissions is generated from heavy-duty diesel vehicles that are parked at truck stops, rest areas, and to a lesser extent, distribution centers.

Control Strategies:

City and County Restrictions on Air Quality Action Days: Ozone Season 2006

In June, a memorandum (Appendix N-1) regarding local government actions on Air Quality Action Days was issued by the Winchester city manager and Frederick County administrator to all respective local government agencies and offices. This memorandum specified restrictions on engine idling of gasoline powered, publicly owned vehicles on Air Quality Action Days. Other AQAD actions specified in the memorandum included postponement of mowing and the use of oil-based paints and solvents, restrictions on any burning associated with county land clearing and construction, as well as the limitation of prolonged outdoor exertion by government employees.

On June 18, the area's only forecasted Action Day, this memorandum was disseminated to all local government agencies and offices.

Clean Diesel Network

A sixth dimension of the Air Quality Action Day Network was developed this year and is referred to as the Clean Diesel Network (CDN). The CDN was created due to the recent increase in truck traffic on Interstate-81.

The Clean Diesel Network is a voluntary program that will be specific to all Winchester-Frederick County members of the freight industry, including fleet and trucking companies, truck stops, and rest areas. By enrolling in the CDN, members agree to educate employees and/or customers of the benefits of reduced engine idling, particularly on ozone Action Days. When an Action Day is predicted, the designated Clean Air Coordinator will receive a press release (Appendix E-6) emphasizing engine idling reduction as a step to reduce emissions for that day.

For more information on the Clean Diesel Network, visit the Valley AIRNow Web site at <http://www.valleyairnow.com/cleandieselnetwork.htm>.

Frederick County Public Schools Bus Idling Policy

Frederick County Public Schools imposed an idling policy for all County school buses that reads,

"Due to the increased health concerns relating to diesel emissions as well as rising fuel cost, Frederick County Public Schools has established the following anti idling policy.

- When performing pre-trip inspections, start the bus only at the point determined necessary to evaluate certain operational functions.
- Avoid all unnecessary idling while waiting at schools to load or unload students. This requirement applies to all am/pm, kindergarten, tutor and activity runs, field trips, etc.
- Follow manufacturer's recommendations on limiting idling time to five minutes or less, with the exception of medical requirements (heat or a/c) of special needs passengers.
- If your bus is equipped with an engine block heater and has been plugged in overnight it is unnecessary to start it to warm it up.

- In extreme cold weather conditions, a “cold weather starting” procedure may be implemented for the purpose of assuring the safety of students and will supersede the above requirements.”

This idling policy can be found in the Frederick County Driver’s Handbook—one that is issued to all bus drivers in the school system.

5. School Bus/Heavy Duty Fleets Retrofits

Retrofitting heavy duty diesel engines with emissions-control technologies, such as EGR systems or after-treatment devices, is an emissions-control measure that was addressed by the Northern Shenandoah Valley Task Force and completed as of December 2005. Eighteen Winchester City and 124 Frederick County schools buses were retrofitted with diesel oxidation catalysts. In addition, the ECM on all six late model school buses were reprogrammed to reduce NOx emissions. Refer to Appendix V for a list of EPA Mid-Atlantic Clean Diesel projects, which includes Frederick County and City of Winchester school bus retrofit information.

6. Voluntary Industrial Reductions

Although emissions-reduction benefits are sometimes difficult to quantify for voluntary industrial reductions, a campaign to promote voluntary measures by local industries is a reasonable and practical method to improve local air quality. Additionally, this strategy helps to increase awareness of the pollution problem and establish a relationship between local government and area industry.

Control Strategies:

Valley AIRCorps Program: Ongoing 2006

Valley AIRNow continues to recruit new members in a year-round effort for its Valley AIRCorps business outreach program. Upon enrollment in the program, companies designate a Clean Air Coordinator, who will receive email or fax notification of an Air Quality Action Day. The company can choose to formulate and personalize their AQAD program by encouraging alternative commute options, promoting telecommuting to those employees who qualify, regularly providing sponsorship for community events, regularly providing AQAD outreach assistance, lending use of dynamic message signs, and other emissions activities on AQAD. Companies have the flexibility to implement any creative policy that reduces emissions during ozone season.

For more information on the AIRCorps program, refer to Page 14.

Clean Diesel Network: Ongoing Development

A sixth dimension of the Air Quality Action Day Network was developed this year. It is referred to as the Clean Diesel Network (CDN). The CDN was created due to the recent increase in traffic on Interstate-81. The Clean Diesel Network will be specific to all Winchester-Frederick County members of the freight industry, including fleet and trucking companies, truck stops, and rest areas. By enrolling in the CDN, members agree to educate employees and/or customers of better engine management practices (i.e., reduced idling), particularly on ozone Action Days. When an Action Day is predicted, the designated Clean Air Coordinator will receive a press release (Appendix E-6) explaining the health risks involved and the steps each business can take to reduce emissions for that day.

For more information on the Clean Diesel Network, refer to Page 14.

Appendix A

Summary Chart

Control Measure	Summary description of control measure	Program/Measure status	Implementation Date	VOC/NO _x Reductions	Resources	Additional Information
Ozone Action Days/Public Awareness Campaign	A comprehensive local Ozone Action Days Program. This strategy is a combination of a number of measures that had been evaluated earlier as individual strategies and are currently being maintained and promoted, including: • General Public Awareness Program • School-based Public Awareness Program • Education and Promotion Campaign • Education and Promotion Campaign • Employer-based Ozone Action Days • Area Sources Ozone Action Days • Dynamic Message Signs • Video Monitor Deployment • Lawn and Garden Equipment Usage Restrictions for State/Local Governments • Other State/Local Government Restrictions (Refueling, Pesticides) • Voluntary Restrictions by Public (Lawn and Garden, Refueling, Others) Further information can be found in the SIP submitted December 30, 2004 on page 13, and in Appendix B	Valley AIRNow, an education and outreach program, was created in April 2005 to address this milestone, and continues its maintenance, implementation, and promotion in 2006. The activities of the program are broken down into two main categories: networks and information dissemination. Networks: <u>Government Air Quality Action Day Network</u> • Valley AIRNow continued to collaborate with City/County officials and designated Clean Air Coordinators to maintain and enforce the Air Quality Action Day (AQAD) Plan for Local Government. This Plan consists of (a) the dissemination of Alerts by the City and County-wide Clean Air Coordinators before predicted high ozone days specifying measures employees can take to protect their health and reduce emissions for that day, and (b) the restriction of City/County department activities, such as mowing, painting, open burning, idling, and physical outdoor exertion on Action Days. <u>Schools Air Quality Action Day Network</u> • Valley AIRNow continued to collaborate with City and County schools to maintain and enforce the Air Quality Action Day (AQAD) Plan for Educators. This Plan consists of the dissemination of Alerts by the City and County-wide School Clean Air Coordinators before predicted high ozone days. Specific measures employees and students can take to protect their health and reduce emissions for the day, are clearly identified.	Public Education and Outreach launched 2004 with creation of website, PSAs, and Air Quality Action Day alerts. Valley AIRNow Air Quality Education and Outreach Program launched April 2005. Full implementation completed September 30, 2005. Ozone Action Days/Public Awareness Campaign maintained, expanded and promoted October 2005 to present.	Please refer to associated VADEQ document for all reductions estimates.	Funding provided by Winchester-Frederick County and the SHENAIR Institute.	Additional information on Valley AIRNow, including outreach materials, can be found at www.valleyairnow.com or by request at info@valleyairnow.com .

Ozone Action Days/Public Awareness Campaign (cont...)		- Valley AIRNow developed an idle reduction program for schools. Staff met with Frederick County Public Schools (FCPS) Superintendents to discuss the possibility of installing idle reduction signs in parent pick-up zones. - Valley AIRNow and SHENAIR met with FCPS Superintendents to discuss the possibility of implementing a biodiesel program for County school buses. - Valley AIRNow met with FCPS Superintendents to discuss the possibility of implementing the Clean Air Champions program in high school Driver's Education classes. - Valley AIRNow and SHENAIR staff hosted an interactive, air quality session for area students on National Alternative Fuel Vehicle Day Odyssey. - SHENAIR provided two FCPS with a set of certified GLOBE Surface Ozone equipment for classroom implementation. - Valley AIRNow and SHENAIR staff attend a GLOBE Train The Trainer Workshop to be certified to train K – 12 teachers interested in becoming GLOBE educators. - Valley AIRNow continued to use Smog Dog at events as an educational, public outreach tool for kids. <u>Media Air Quality Action Day Network</u> - Valley AIRNow continued to collaborate with television, print, and radio resources in and around Winchester-Frederick County to maintain the Air Quality Action Day (AQAD) Plan for Media. This Plan consists of the dissemination of Alerts by Media Clean Air Coordinators before predicted high ozone days. Specific measures employees and audiences can take to protect their health and reduce				
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Ozone Action Days/Public Awareness Campaign (cont...)		emissions for the day, are clearly identified in the Alert. • Valley AIRNow related events were featured in several newspaper articles, television and radio spots in 2006. • Multiple PSAs were run on local radio and television stations. • WAZT-TV incorporated air quality information into their local broadcasts. • Informational media kits were distributed throughout the 2006 ozone season. <u>Health Air Quality Action Day Network</u> • Valley AIRNow continued to collaborate with Northern Shenandoah Valley health-care providers to maintain the Air Quality Action Day (AQAD) Plan for Health. This Plan consists of the dissemination of Alerts by Health Clean Air Coordinators before predicted high ozone days. Specific measures employees and patients can take to protect their health and reduce emissions for the day, are clearly identified in the Alert. • Valley AIRNow partnered with various health organizations (e.g. Valley Health Systems, The American Lung Association, Winchester Parks & Recreation, Winchester Green Circle) to provide informational health and ozone materials to the community at various events. <u>Business Air Quality Action Day Network</u> • Valley AIRNow continued to collaborate with various Winchester-Frederick County businesses to maintain the Air Quality Action Day (AQAD) Plan for Business. This Plan consists of the dissemination of Alerts by designated Business Clean Air Coordinators before predicted high ozone days. Specific measures employees and customers can take to protect their health and reduce emissions for				
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Ozone Action Days/Public Awareness Campaign (cont...)		the day, are clearly identified in the Alert. - Valley AIRNow continued to promote and expand the Valley AIRCorps business outreach program. Current membership in the AIRCorps program as of December 2006 is a variety of 27 manufacturing, petroleum, and health/fitness businesses. - The Clean Diesel Network, a new strand of the Valley AIRNow AQAD network, was developed for area members of the freight industry. Member recruitment is ongoing. Information Dissemination: <u>Stakeholder Building</u> - Valley AIRNow adapted, revised, and/or developed AIRCorps educational and recruitment posters, Clean Diesel Network materials (brochures, signs, bumper stickers, bookmarks and posters), public service announcements, media kits, news briefings, presentations, informational bookmarks and a variety of other informational materials. - Valley AIRNow hosted, attended, and/or presented at the following events: 2006 Virginia Naturally Conference for Environmental Educators, Opportunity Winchester Street Festival, James Madison University Open House, Green Circle Fall Fitness Fair, National Alternative Fuel Vehicle Day Odyssey, and GLOBE Train The Trainer Workshop. - Valley AIRNow served as a member of several air quality related organizations, including: Commute Smart Virginia, Mid-Atlantic Diesel Collaborative Clean School Bus Workgroup, and Mid-Atlantic Diesel Collaborative Freight Workgroup. - Valley AIRNow continued to provide real-time, local air quality information to the public via the Valley AIRNow website, Valley				
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Ozone Action Days/Public Awareness Campaign (cont...)		AIRNow Air Quality Hotline, and by coordinating with the DEQ Ozone Forecasting Program, EPA AIRNow, American Lung Association's Smog Alert Program, The Weather Channel, and Weather Underground. <u>Coordination</u> • VDOT highway variable message signs will be utilized when VA DEQ designates an Air Quality Action Day, displaying the words "Air Action Day" to inform motorists of current conditions. • Additional VDOT visibility webcams were made available to the public on the Valley AIRNow website. • Valley AIRNow continued to coordinate and host monthly/bi-monthly Air Quality Improvement Task Force meetings, lead the Ozone Action Days/Public Awareness Phase I strategies, and ensure the implementation and maintenance of all other Phase I strategies. • Valley AIRNow continued to coordinate and maintain valuable collaborative partnerships with the following organizations: American Lung Association of Virginia, Eastern Panhandle Clean Air Connection, Winchester Green Circle, Valley Commuter Assistance Program, Winchester Green Circle Project, Mid-Atlantic Diesel Collaborative etc.				
Vehicle Miles Traveled Reduction Programs Vehicle Miles Traveled Reduction Programs	A comprehensive local Vehicle Miles Traveled (VMT) Reduction Program. This strategy is a combination of several individual programs and activities that are promoted to reduce vehicle miles of travel, including: • Enhanced/expanded Northern Shenandoah Valley Regional Commission Ridesharing	Many programs and policies addressing VMT control measures were developed, implemented, and/or expanded upon throughout the Winchester-Frederick County area, including: • Valley Commuter Assistance Program (VCAP, www.vcapride.virginia.gov) via rideshare programs, park and ride lot expansion, coordination with various organizations, outreach events, and media advertisement;	Full implementation completed September 30, 2005. Vehicle Miles Traveled	Please refer to associated VADEQ document for all reductions estimates.	The Valley Commuter Assistance Program is funded by the State, with 20% local matching	Appendix I-K included in the December 2005 NSV Semi-Annual Status Report.

Vehicle Miles Traveled Reduction Programs Vehicle Miles Traveled Reduction Programs (cont...)	Program • Bicycle and Pedestrian Accommodation • Green Space Preservation • Promotion of Mixed Use Development • Promotion of Telecommuting Further information can be found in the SIP submitted December 30, 2004 on pages 13-14, and in Appendix B.	• Metropolitan Planning Organization (MPO) Bike and Pedestrian Mobility Study to integrate bicycle and pedestrian facilities between Winchester and Frederick County; • Metropolitan Planning Organization (MPO) 2030 Transportation Program to create a multi-modal transportation plan that addresses existing and current transportation needs of the Winchester-Frederick County MPO, including: the use of alternate modes of transportation, creation of a transportation network sensitive to the environment, and the utilization of land use patterns that maximize the efficiency of the network; • Bike and Pedestrian Safety Grant project analysis to administer local projects involving the incorporation of pedestrian signals and crosswalks to 7 intersections along the Winchester Green Circle route; • Walking & Wheeling the Northern Shenandoah Valley project to justify further bicycle and pedestrian accommodation studies and projects; • Transportation District Feasibility Study to analyze the feasibility of creating a transportation district to facilitate the expansion of mass transportation services outside the City of Winchester; • VDOT Enhancement grant to construct multi-use asphalt paths along a section of Senseny Road in Frederick County; • Route 11 Corridor Access Management Study to assess proposed improvements, policies and regulations that will reduce congestion, safely and efficiently manage access to adjacent properties, and increase roadway capacity of Rt. 11; • Route 11/Route 37/Shady Elm Drive Interchange Study to assess proposed improvements, policies and regulations that	Reduction Programs developed, implemented, and promoted September 2005 to present.		funds. Funding has been allocated for all bicycle and pedestrian accommodations, green space preservation initiatives, and mixed use development initiatives as described. The funding of the Net Tech Center of Winchester is Congressional ordered and is administered by the GSA.	
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Vehicle Miles Traveled Reduction Programs (cont...)		will reduce congestion, safely and efficiently manage access to adjacent properties, and increase roadway capacity of this interchange area; • James Wood High School Bicycle and Pedestrian Facilities Survey to gather the opinions of County students on bicycle and pedestrian facilities in the area; • Frederick County Conservation Easement Authority to assist county landowners in the protection and preservation of farm land, forests, open space, scenic landscapes, historic sites, water resources, and environmentally sensitive lands; • Virginia Outdoors Foundation Easement Program to promote the preservation of open space lands and to encourage private gifts of money, securities, land or other property to preserve the natural, scenic, historic, open-space and recreational areas of the Commonwealth; • Winchester Green Circle Project to complete the construction of Town Run Linear Park—a section of trail for pedestrians and bicyclists that connects parks, neighborhoods, schools, and tourist attractions; • Balanced Growth Cities Conference entitled, “The Challenges: Preserving the Valley’s Agricultural and Open Space Heritage and Meeting the Service Needs of New Development”; • Comprehensive Plans for the City of Winchester and Frederick County to promote mixed use and cluster development; • Urban Development Area Study to create neighborhoods which incorporate residential, retail, educational, and public uses, commercial services, opportunity for employment, and institutional and recreational resources; • The Villages at Artrip Mixed Use Project to				
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Vehicle Miles Traveled Reduction Programs (cont...)		enable the mixed use development of 793 residential units and Retail, Restaurant, Office, and Public uses. • Orrick Commons Mixed Use Project of retail and residential uses to be located off of Senseny Road in Frederick County. • NetTech Center of Winchester to promote telecommuting services in the Northern Shenandoah Valley area.				
Open Burning Restrictions	A ban(s) and/or restriction(s) on open burning during predicted high ozone days and/or the ozone season. Further information can be found in the SIP submitted December 30, 2004 on page 14, and in Appendix B.	The Frederick County Administrator issued a memorandum for Ozone Season 2006 specifying restrictions on burning associated with County land clearing and/or construction projects on Air Quality Action Days. Winchester City Code prohibits open burning within City limits.	Full implementation completed September 30, 2005. Open Burning Restrictions maintained and promoted for ozone season 2006.	Please refer to associated VADEQ document for all reductions estimates.	Coordination of plans to restrict open burning on Action Days is incorporated into the Valley AIRNow budget.	Appendix E included in the December 2005 NSV Semi-Annual Status Report.
Engine Idling Restrictions	A restriction(s) on public and private diesel truck idling. The EAC jurisdictions are committed to reduce idling of local government vehicles (including school buses) and to promote voluntary restrictions from privately owned vehicles and fleets.	Winchester City and Frederick County issued a memorandum for Ozone Season 2006 specifying restrictions on the idling of local government vehicles on Air Quality Action Days. The Clean Diesel Network (CDN) is a new, voluntary program that is specific to all Winchester-Frederick County members of the freight industry, including fleet and trucking companies, truck stops, and rest areas. CDN members educate employees and/or customers of the benefits of reduced engine idling, particularly on ozone Action Days. Frederick County Public Schools has a school bus idling policy currently in place.	Full implementation completed September 30, 2005. Engine Idling Restrictions maintained and promoted for ozone season 2006.	Please refer to associated VADEQ document for all reductions estimates	Coordination of plans to restrict engine idling on Action Days is incorporated into the Valley AIRNow budget.	December 2005 NSV Semi-Annual Status Report.
School Bus and Heavy	A program involving the retrofitting of heavy duty diesel engines with	The retrofitting of 142 Winchester City and Frederick County school buses with diesel	Full implement-	Please refer to associated	The VA DEQ	Appendix L(a) and L(b)

Duty Fleets Retrofits	emissions control technologies, such as EGR systems, or after treatment devices. Further information can be found in the SIP submitted December 30, 2004 on page 14, and in Appendix B.	oxidation catalysts was completed in 2005. The reprogramming of all late model school bus ECM devices was completed in 2005 as well.	tation completed September 30, 2005. No further control strategy progress exists for 2006.	VADEQ document for all reductions estimates.	committed \$475,000 to complete this project in 2005.	included in the December 2005 NSV Semi-Annual Status Report.
Voluntary Industrial Reductions	A voluntary reductions program for local industries. The EAC jurisdictions are committed to seek voluntary commitments from local industries to reduce ozone precursor emissions during the ozone season and/or on predicted high ozone days. This strategy will help increase awareness of the pollution problem and establish a relationship between local government and area industry. Further information can be found in the SIP submitted December 30, 2004 on page 14, and in Appendix B.	Valley AIRNow worked with local industry through the AIRCorps program to formulate unique and personalized programs/policies for members that reduce smog-inducing emissions, particularly on Air Quality Action Days. New members are recruited for the program in a year-round effort. The Clean Diesel Network (CDN) is a new, voluntary program that is specific to all Winchester-Frederick County members of the freight industry. By enrolling in the CDN, members agree to educate employees and/or customers of better engine management practices (e.g. reduced engine idling), particularly on ozone Action Days.	Full implementation completed September 30, 2005. Voluntary Industrial Reductions program maintained and promoted September 2005 to present.	Please refer to associated VADEQ document for all reductions estimates.	Coordination of plans for Voluntary Industrial Reductions on Action Days is incorporated into the Valley AIRNow budget.	Additional information about Valley AIRCorps, including program materials, can be found at www.valleyairnow.com/aircorps.htm .

Appendix B

Mid-Atlantic Diesel Collaborative Workgroup Materials



Agenda
Clean School Bus Sector Workgroup
November 16, 2006
10:00 am – 11:00 am EST
Call-in number: 866-299-3188
Passcode: 2158145616

Facilitator: Paula Krall, US EPA Region 3

Welcome and Introductions – Paula Krall, US EPA Region 3

*Presentation/Training- An introduction & hands-on training for EPA's new emissions calculation tool known as the Diesel Emissions Quantifier (DEQ) given by Jennifer Went, OTAQ, EPA Headquarters.

*This is an interactive training session. If possible, try to get access to a PC during the call.

Workgroup Business

- Future facilitator for workgroup calls
- Initiatives/projects for FY 07

Adjourn

MDC FREIGHT WORKGROUP
Conference Call Agenda
November 28, 2006
10:00 - 11:00 p.m. EDT

Call-in Number: 866.299.3188
Conference Code: 215.814.5616

- 10:00 Welcome, Introductions, and Review of the Agenda
- 10:10 The National SmartWay/SBA Loan Program, EPA Headquarters
- Overview and Update
 - How can MDC help advertise the program?
- 10:30 The “Interest Rate Buy Down” Concept, EPA Headquarters
- What is this concept?
 - State Infrastructure Banks (SIBs) in EPA Region 3
 - How do we get SIBs engaged in the Collaborative?
 - What is the best strategy for approaching them?
- 10:50 Update on the SmartWay Energy Service Company (ESCOs) Meeting,
EPA Region 3/EPA Headquarters
- What are energy service companies
 - What is the benefit to trucking companies
- 11:00 Next Call - Suggestions for Topics

Appendix C

News Coverage – Print

'Take It Personally'

What You Can Do to Combat 'Noxious' Ozone

By TODD HEDINGER

"Take it personally."

The expected phrase is "Don't take it personally," but when it comes to the air we breathe, it's a very personal matter! Valley AirNow, the air quality outreach program for Winchester-Frederick County, challenges the Northern Shenandoah Valley to take our air quality personally, because that's how we'll protect it, our quality of life, and our community for today and tomorrow.

May 1 through Sept. 30 is ozone season in Virginia. For us non-scientists, that translates to smog season. This makes a difference to Winchester-Frederick County because since 2004, our area has been working with the Environmental Protection Agency to reduce the amounts of ground-level ozone (a.k.a. smog) generated locally.

Many of us have been making an effort, and our air quality is headed in the right direction. Some of the good effects we can expect to see from reduced ozone are clearer days and fewer asthma attacks.

For those interested in joining the effort, we present a crash course on ground-level ozone and small actions you can take to reduce it.

Ozone 101

There is good and bad ozone. Good ozone occurs 10 miles up and higher in the atmosphere, where it helps filter out harmful ultraviolet radiation. But ozone has bad health effects for people, plants, and animals, so it is a public health problem when it occurs at or near ground level.

Ground-level ozone is formed when sunlight and heat "cook" two kinds of precursor chemicals, nitrogen oxides and volatile organic compounds. This is why ozone season occurs between May 1 and Sept. 30: It takes the sunlight and heat of summer to produce ground-

level ozone.

Nitrogen oxides, or NOx, are a major component of emissions from vehicles and smokestacks. Volatile organic compounds, or VOC, are the "aromatics" you smell from sources such as lead-based paint, gasoline fumes, and solvents. When NOx and VOC combine in sunlight and heat, ground-level ozone forms.

Some of our precursor chemicals are transported into the area from other parts of the world. But we produce tens of thousands of tons of those chemicals each year locally as well. They come out of our smokestacks, and up to 45 percent of them come out of the tailpipes of our cars and trucks.

The chemical reaction that produces ground-level ozone is natural. We can't stop it from happening. We also can't stop the heat and sunlight of summer. What we can do is work to limit the amounts of NOx and VOC we release in the air — not just in the summer, but all year long.

How can we limit those chemicals? By taking it personally, because reducing emissions takes subtle lifestyle changes.

Anybody who has ever gone on a diet or quit a bad habit knows how hard it can be to make lifestyle changes. The good news about emissions behavior is that simple steps can make a positive difference — especially if we all do our share. What can you do?

To limit NOx, limit your driving.

- Ride a bike or walk whenever you can. You'll improve your health, and the air. You'll save on gasoline, and you'll reduce traffic congestion.

- If you need motorized transportation to get to school, work,

church, and other scheduled destinations, take the bus, or carpool. For information on the Rideshare carpool matching service, call 540-635-4146.

- When you have errands, try to "trip chain" — that is, run all your errands in a series, because a car which has cooled down can emit up to 50 percent more than one which is warmed up.

- See if your employer will let you telecommute. The first telecommuting center in the nation, Net-Tech Center of Winchester, is located at 2281 Valley Ave. For information, call 540-450-2222.

- Instead of using drive-through services at banks and fast-food restaurants, shut off your car and go inside.

- Keep your car in peak condition. Cars that are tuned, with properly inflated tires and new air filters, use less gasoline and run cleaner.

To limit VOC, be careful with those stinky chemicals!

- Gas up your vehicle at night. If you gas up when there is no sunlight, the VOC can't get "cooked" with NOx.

- Don't "top off" the tank. Gasoline spillage evaporates into the air. Let the automatic shut-off do its job.

- Limit charcoal grill usage. Charcoal lighter fluid evaporates when it burns, putting chemicals in the air.

- Limit your use of oil-based paints.

- You can also plant a tree — or, better yet, several trees! They do a super job removing pollutants from the air, water, and soil.

If we all take it personally and make subtle lifestyle changes, we will do our share to protect our air. Please, do your part!

Open Forum is a column available to Star readers to address a subject of their choice. Todd Hedinger is co-coordinator of Valley Air Now, affiliated with James Madison University in Harrisonburg.

OPEN FORUM

The Winchester Star
Friday, April 28, 2006

A3

C-1

Having a Bad 'Air' Day?

Not the Case Now in Winchester, Frederick County

By TIFFANY A. TUMER

OPEN FORUM

Are you having a bad "air" day? If you live in Winchester or Frederick County, you're not!

Since July 3, 2004, the Winchester-Frederick area has had zero Air Quality Action Days of code orange or higher. Valley AIRNow would like to celebrate this achievement by honoring the community and our AIRCorps program members during this week of National Air Quality Awareness, May 15-19.

What are Air Quality Action Days (AQAD)? They are based on the Air Quality Index and indicate days on which unhealthy ozone concentrations occur in the area. The Air Quality Index (AQI) is a simple tool for measuring ozone that consists of five colors, or levels of concern — green, yellow, orange, red, and purple.

A green AQI reading signifies that air quality is good and no health impacts are expected. A yellow reading denotes moderate air quality and suggests that unusually sensitive people, such as those with lung disease or respiratory problems, should consider cutting back on prolonged outdoor exposure.

On orange ozone days, considerable adverse health effects may occur, and an AQAD is issued to warn the public of these concerns as well as inform us of steps that can be taken to improve overall air quality. An orange ozone day denotes that air quality is unhealthy for the following sensitive groups: active children, active adults, the elderly, and people with respiratory disease, including asthma. The Environmental Protection Agency recommends that those people falling within one or more of these groups

should limit prolonged outdoor exertion and exposure.

The Virginia Department of Environmental Quality monitors ozone levels in Winchester-Frederick County and issues daily ozone forecasts for our area based on this Air Quality Index. For more information on how to obtain these forecasts, you can call the Valley AIRNow Air Quality Hotline at (540)-450-2207, or contact us at info@valleyairnow.com.

AQAD and AIRCorps

In response to AQI days of code orange or higher and the associated health effects, the AIRCorps program of Valley AIRNow was created. AIRCorps is a business, health, and media outreach program that is completely free to join! By becoming a member of AIRCorps, local businesses and organizations agree to enroll in our ozone Air Quality Action Day Network, an informational network to inform the public of Code Orange Action Days and steps that can be taken to reduce smog-inducing emissions.

Signing up for the AIRCorps program is simple — register with Valley AIRNow, receive AQAD alerts on code orange days, and inform your employees and/or customers on those days. That's it! It's a simple and easy process to show that your business cares about local air quality and the health of the community.

To date, the following businesses have shown their support of good air and health by enlisting in the AIRCorps program: AirPac Inc., Bank of Clarke County, BB&T, Commerce Mortgage Inc., Emmart Oil Co., Executive Protection Sys-

tems, General Electric (Winchester Lamp Plant), Handley Regional Library, Holtzman Oil Corp., Holtzman Propane, H.N. Funkhouser & Co., Morgan Oil Corp., NetTech Center of Winchester, Nikken Lifetime Wellness Associates, Roach Energy, Runners' Retreat, Skyline Oil Inc., Wachovia, The Willows at Meadow Branch, Winchester Courtyard by Marriott, and Winchester Family Health Center.

"Celebrate good times"

... And good air! Thanks to these members of the Valley AIRCorps program, the Northern Shenandoah Valley Air Quality Task Force, local government, and supporting Winchester and Frederick County community members, the last ozone season was AQAD free!

To celebrate, Valley AIRNow is holding a Clean Commute and AIRCorps Recognition event on May 19 at the NetTech Center of Winchester. This event will take place from 12 noon to 1 p.m. and will consist of refreshments, a brief tour of the center, and a presentation of awards to the 2005 AIRCorps members.

In addition, the NetTech Center will be offering free telecommute usage on that day. All existing and potential AIRCorps members, as well as anyone interested in learning more about alternative methods of commuting, are invited.

For more information on this event or how to become a 2006 member of the AIRCorps team, visit www.valleyairnow.com or send us an e-mail to info@valleyairnow.com.

Open Forum is a column available to Star readers to address a subject of their choice. Tiffany A. Tumer is air quality outreach coordinator for Valley AIRNow at James Madison University in Harrisonburg.

Mona Charen is a political writer. Her column is distributed nationally by the Creators Syndicate.

Telecommuting an Environmentally Friendly Convenience

Completing Work Via Computer and Telephone Cuts Down on Driving Time and Ground-Level Ozone

By Sarah A. Reid
The Winchester Star

More than a month ago, civil servant Mary Pendleton would have been spending her workday in a Pentagon City office checking over adjudicated claims of lost or damaged luggage.

By the end of the day, she would have driven 150 miles, round trip, between her Winchester home and the U.S. Department of Homeland Security's Transportation Security Administration.

But on Friday, the 58-year-old was relaxed, yet working, in a private cubical designed for telecommuting in the NetTech Center on Valley Avenue.

"I had the longest commute, and now I think I have the shortest," Pendleton said as her lips curled into a smile.

Since April, she's been working via computer and telephone — like four other long-distance Transportation Security Administration telecommuters in Maryland — as part of a pilot telework program.

She meets with the Maryland telecommuters once a week, on Tuesdays, when she goes to the Pentagon City office, picks up a week's worth of work, and drops off what she's completed.

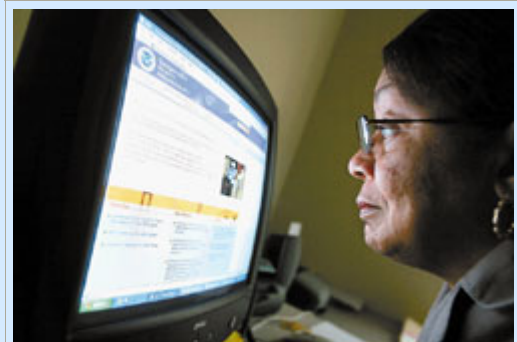
"They tease us because we all come in smiling on Tuesdays," she said. "We are happy now."

Pendleton started with TSA in 2002 but, as gas prices and her time on the road increased, so did her exhaustion, financial strain, and health issues.

"Half the time, you take a sick day because you really can't make the drive more so than you can't do the work," she said.

Those issues prompted Pendleton to try teleworking.

Just down the hall from her at the NetTech Center, another organization was promoting the new telecommuting technology Friday as a way to reduce ground-level ozone as part of its self-designated Clean Commute Day.



Mary Pendleton of Winchester traded her commute to Pentagon City for a work station at the NetTech Center on Valley Avenue, where she is now a teleworker for the U.S. Department of Homeland Security's Transportation Security Administration.
(Photo by Jeff Taylor)

“Ozone is great up in the atmosphere because it blankets us and protects us from UV rays, but at ground level, it can cause a lot of adverse health effects,” said Tiffany A. Tumer, air quality outreach coordinator with Valley AIRNow of Winchester.

Ground-level ozone is created in warm-weather months when heat combines with nitrous oxides and volatile organic carbons often found in exhaust, solvents, fingernail polish, and in nature.

The chemicals hang in the air and can cause the smoggy haze that is sometimes seen hovering around the mountains that surround the Shenandoah Valley.

People that breathe in the ozone compounds can experience respiratory problems from coughing and chest tightness due to shortness of breath, depending on their sensitivity and the accumulation of chemicals in the air, Tumer said.

The Virginia Department of Environmental Quality measures ground-level ozone levels and posts them on their Web site, www.deq.state.va.us/airquality, and on an Air Quality Hotline, (804) 698-4444. The levels are measured in what is called an Air Quality Index, which uses colors just like the Department of Homeland Security’s threat level advisory system does. While the color red means there’s a severe risk of terrorist attacks on the Homeland Security scale, the Air Quality Index’s red — the second-highest rating — means air quality is unhealthy.

“Orange days we are most concerned with, because that’s when active children, active adults, people with respiratory disease and asthma, can be affected,” Tumer said, noting these people might want to curb outdoor physical activity when the ground-level ozone layer is heavier.

When the index is orange, Valley AIRNow sends out an air quality alert to people and organizations in its network.

No notices needed to be sent out in 2005, but one notice went out in both 2003 and 2004 and nine were issued in 2002, according to the Virginia Department of Environmental Quality’s Web site.

During ozone season, which lasts from May 1 to Sept. 30, and during air quality alert days, Valley AIRNow recommends residents refuel vehicles after 6 p.m., combine errands into a single trip, and carpool, bike, or walk to destinations if possible.

Jennifer Schneider, the director of public and government affairs for Executive Protection Systems in Winchester, represented one of the businesses that has partnered with Valley AIRNow to get the word out about air quality alerts.

While Tumer is trying to get businesses to be more proactive in promoting and practicing clean air techniques, Schneider said Executive Protection Systems already carpools, but not primarily because of ozone concerns.

“We do it for the cost efficiency,” Schneider said. “It’s easier on the employees.”

The 25-person emergency preparedness company trains government employees in Washington, D.C., and Maryland, and sometimes provides and maintains their equipment, she said.

“It helps us be more environmentally conscious,” Schneider said.

NetTech Center Director Linda Whitmer echoed Schneider’s comments, noting many people use one of the company’s 14 congressionally created telework centers for reasons other than

environmental concerns. “They hate the drive,” Whitmer said. “They don’t want to do it ... But there are the secondary factors for these people.”

Some of the secondary factors she cited were having one less car and a happier home life.

The Winchester center can seat 31 people and saves an estimated 1,513 round-trip miles a day, or 6,996 gallons of gas a year, according to NetTech Center statistics.

Valley AIRNow pushing air quality

By Alex Bridges
Daily Staff Writer

WINCHESTER — Regional air quality watchdogs have high hopes for fewer hazy days during the ozone season that started this week.

Valley AIRNow, a nonprofit air-quality group based in Harrisonburg, marked the season at the NetTech Center in Winchester on Friday at the end of National Air Quality Awareness Week. They also lauded a local firm for its work to get the word out to curb ozone.

The Winchester-Frederick County area was cited for non-attainment for federal ozone standards several years ago. The community must come back into compliance with federal guidelines or face a gasoline tax increase and mandatory vehicle emission systems inspections.

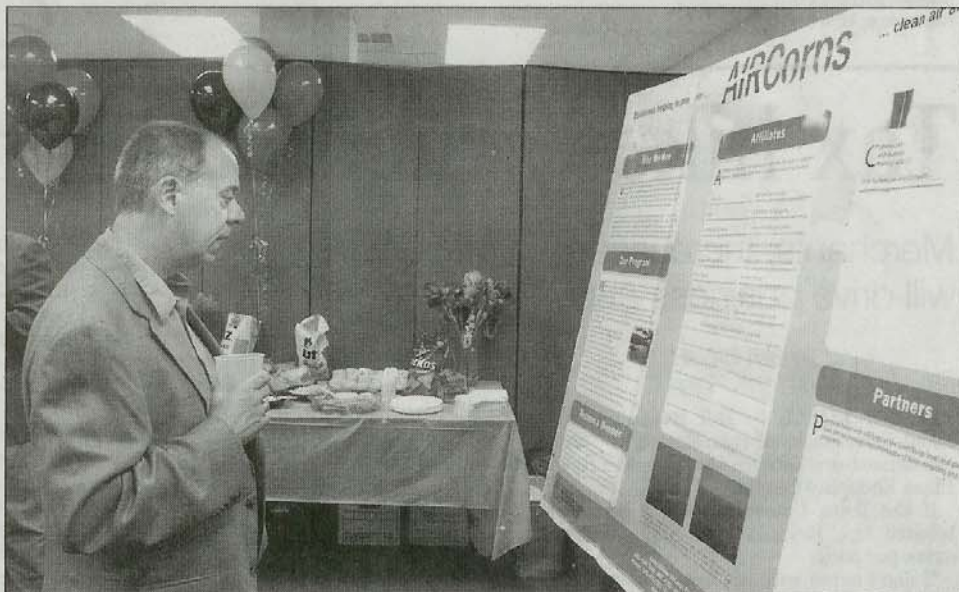
Valley AIRNow — part of Shenandoah Valley Air Quality Initiative, or Shenair, at James Madison University — also recognized the AIRCorps, businesses and local governments that receive alerts on days with high and unhealthy ozone levels and take actions to make the air cleaner.

"We're trying to get local businesses to do a little more to spread the word about air quality and to help protect the air," said Tiffany Tumer, air-quality outreach coordinator for Valley AIRNow.

Many regional firms have jumped on board in AIRCorps' first year.

Petroleum firm H.N. Funkhouser & Co. received a special recognition at the event for "going the extra mile." Besides displaying AIRNow posters in all of the company's 16 HandyMart locations, Funkhouser also gave free coffee and doughnuts to car-poolers and those who refueled their vehicles on Air Quality Action Days.

"We got involved because everyone wants to have clean air, and this is my hometown, and I have children living in this community, and now I have



Alan Lehman/Daily

Steve Howe, chief financial officer of Executive Protection Systems, of Winchester, looks at an AIRCorps display at the NetTech Center in Winchester on Friday.



Claytor



Tumer

grandchildren," said Robert Claytor, president of H.N. Funkhouser & Co. "We need to make sure that our threshold goes down to accommodate the growth that's going to be coming."

Claytor warned that the area could suffer financially if ozone levels do not fall back into compliance.

But the region has had good news: Department of Environmental Quality monitors recorded no "orange" days last year, Claytor said. The "orange" designation means the air quality is dangerous for those with respiratory problems.

Most of the 22 AIRCorps members act as affiliates who receive information from the organization through the Air Quality Action Day program. Contributors, like H.N. Funkhouser, also give either financial or in-kind donations to Valley AIRNow or take action above the basic requirements for affiliates.

AIRCorps seeks to build partnerships with Winchester and Frederick County businesses

and provide public health networking through the air-quality action days, Tumer said. They also are pushing an initiative to help members develop commuter programs.

NetTech, a federally funded site at 2281 Valley Ave. for telecommuters, has a similar mission — to help cut on vehicle emissions that help create ozone and smog and protect air quality. It has 31 spaces for telecommuters with about 70 percent in use at most times, Director Linda Whitmer said.

"I consider the center a tremendous asset to the com-

munity because we are keeping the people off the roads, hopefully, helping in some way reduce the air emissions and all the things that go along with that," Whitmer said.

The site opened in 1993 in downtown Winchester as the first of 14 centers in the greater Washington area, for federal teleworkers and later for the private sector.

NetTech is also a member of AIRCorps and helps Valley AIRNow.

► Contact Alex Bridges at abridges@nvdaily.com

Daily News-Record (Harrisonburg, VA)

June 12, 2006

Section: Valley Virginia

Teachers Span The GLOBE

Educators To Attend Sessions That Emphasize **Air Quality**

DAN KIPPERMAN, Daily News-Record

Area teachers will get a new look at environmental studies later this month. More than a dozen middle school teachers will attend work sessions at James Madison University in an attempt to focus more attention on **air quality**.

The 14 teachers from Harrisonburg and Rockingham County will participate in JMU's pilot program GLOBE (Global Learning and Observations to Benefit the Environment), said Tiffany Newbold, an **air quality** expert at JMU.

GLOBE is a worldwide organization that provides instruction to teachers who are willing to do more with environment in the classroom, Newbold says.

"We want to start out small," said Shenandoah **Air Quality** Initiative (SHENAIR) chairman Steve Bauserman. "But I think eventually, this will prove to be a very successful program."

Bauserman hopes that in 10 years, the majority of middle and high school teachers will have participated in at least one GLOBE workshop.

SOL Ready

A major **quality** teachers see in the GLOBE program is the connection with Virginia's Standards of Learning tests.

"The SOL's are so important these days," said Tiffany Newbold. "What GLOBE is teaching the teachers really plays into that a lot."

GLOBE provides educators with alternative ways to teach environmental issues in today's schools.

Teachers have been assured that GLOBE presentation will correlate with the yearly standardized tests.

"If there was a hesitation with the teachers before, knowing the SOL's would be included really convinced a lot of them to participate," Newbold said.

The GLOBE work sessions will begin on June 26 at JMU.

Contact Dan Kipperman at 574-6274 or dkipp@dnronline.com

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EPA Newsroom

14 Communities Continue Early Smog Reductions

Release date: 08/04/2006

Contact Information: John Millett, (202) 564-4355 / millett.john@epa.gov

(8/4/06) Fourteen communities across the United States remain ahead of schedule in the effort to reduce ground-level ozone, or smog. Due to the progress these areas have made and continue to make under EPA's Early Action Compacts program, the agency is proposing to defer certain ozone pollution requirements. As part of EPA's voluntary Early Action Compacts program, these communities committed to meeting EPA's more stringent 8-hour ozone standard by Dec. 31, 2007, one to two years earlier than required by the Clean Air Act.

Early Action Compacts provide a strong incentive for state and local governments, civic leaders and business interests to develop innovative, cost-effective strategies for improving ozone air quality in ways that are tailored to individual communities. There are 29 Early Action Compact areas in the country. Fifteen of these communities already meet the 8-hour ozone standard, but chose to join the compact to ensure that they stay in attainment while continuing voluntary steps to protect the health and quality of life in their communities.

Today's action proposes to defer the effective date for nonattainment designations for the 14 communities that are in non-attainment but are ahead of schedule to meet the standard. This is the third proposed deferral for these areas. If they meet the 8-hour standard by Dec. 31, 2007, which they are on track to do, they will be designated as in attainment. The areas are: Frederick County/Winchester, Va.; Roanoke, Va.; Washington County/Hagerstown, Md.; Berkeley & Jefferson Counties, W.Va.; Hickory/Morganton/Lenoir areas, N.C.; Fayetteville, N.C.; Greensboro/Winston-Salem/Highpoint areas, N.C.; Greenville-Spartanburg-Anderson, S.C.; Columbia area, S.C.; Chattanooga area, Tenn.; Nashville area, Tenn.; Johnson City-Kingsport-Bristol area, Tenn.; San Antonio area, Texas; and Denver-Boulder-Greeley-Ft. Collins-Love area, Colo.

[More information about the proposed rule and the Early Action Compact Program:](http://epa.gov/oar/eac/)

Saturday, August 12, 2006

MPO wants input on mobility plan

By Mark R. Dorolek
The Winchester Star

Winchester — The Winchester-Frederick County Metropolitan Planning Organization is looking for public input to complete a long awaited Bicycle-Pedestrian Mobility Plan.

“This is a project that we really want to do,” said Glen P. Burke, vice chairman of the MPO Policy Committee.

The MPO has put a link on its Web site, www.winfredmpo.org, to get feedback on what should be done to get paths and sidewalks to various destinations of interest in the Winchester area.

Burke said the MPO has been trying to get a plan like this in place for years because it would help the environment and allow people to walk to locations such as schools.

“It just makes good sense,” Burke said.

He said the MPO will do its best to get the plan implemented. “We are pushing very hard for this, and I think I speak for the whole MPO.”

Burke said there is grant money available to get the project started, but the MPO is still looking for funds that would allow the plan to be completed.

The MPO has hired Toole Design Group of College Park, Md., to formulate the plan.

“These people are really good at this type of work,” said Steve Kerr, secretary-treasurer of the MPO.

Kerr said the MPO has received \$80,000 in grant money from the Virginia Department of Transportation and \$2,500 each from Winchester and Frederick County.

Kerr said once the plan is finished, it will be reviewed by the MPO’s Citizens and Technical advisory committees before it could be approved by the Policy Committee.

Kerr said once the plan is in place, the MPO could ask for a path or sidewalk to be put in by VDOT if it were to do a street widening in either Winchester or Frederick County.

“Once the study is done, we hope to use it to get other grant money to do other projects,” Kerr said.

Jennifer Hefferan, transportation planner for Toole Design Group, said the firm will be looking at existing amenities in the area such as sidewalks, bicycle lanes, and paths.

Hefferan said the firm will also recommend policy guidelines the MPO can use to implement its plan.

“We are still early in the process, so we haven’t made any recommendations,” Hefferan said.

The MPO will hold two public meetings to present its findings and get input from residents before finally presenting the final plan.

Hefferan said she hopes to have a finished plan by the start of 2007.

James D. Lawrence Jr., a member of the MPO's Steering Committee for the Bike and Pedestrian Mobility Study, said the project is not designed to sit on a shelf and collect dust.

"The project's focus has always been on implementation," Lawrence said.

He said the MPO would like a lot of "public input involvement so we come away with needs and desires across the community, not just for the avid cyclist or jogger."

Lawrence said he believes Winchester and Frederick County will be in favor of the project when they see the community's desire for it.

— *Contact Mark R. Dorolek at mdorolek@winchesterstar.com*

Thursday, September 28, 2006

Celebrate Winchester at Opportunity Festival

By Teresa Dunham
The Winchester Star

WINCHESTER— What if only nice people were allowed on the Loudoun Street Mall for a day?

The city isn't kicking out any mean people — but lots of neighborly folks will be hanging out in downtown Winchester from 1 until 3 p.m. on Saturday.

As part of the third annual Opportunity Winchester Street Festival and All-American City Community Celebration, representatives from several local nonprofit groups will set up booths and introduce themselves to the community.

Whether area residents want to help keep animals safer, get involved in a political scene, sign up for a library card, or find out where to donate canned goods, the festival offers an outlet for everyone to become involved and learn about services the groups offer.

“We’ve filled up the mall in the past,” said Jim Riley, an Opportunity Winchester volunteer. “It’s a celebration of what these agencies do ... and it helps promote more volunteers.”

Supported by the city government, Opportunity Winchester is a citizen-led initiative that has been working to create a shared community vision using statistical information and public comment.

The day is also a way to celebrate the All-American City award that Winchester won in 2005.

To sweeten the deal, the Winchester Parks and Recreation Department will provide activities for children, and the music of 45 RPM will keep toes tapping. Real Classic Rock 104.9 will also set up a live remote broadcast from 11 a.m. until 1 p.m.

The festivities are free for the non-profit groups and for the community members who come downtown to visit.

In addition, free parking is available from 7 a.m. until 7 p.m. in the downtown parking garages, and street parking is always free on weekends.

About 40 organizations have participated in the previous festivals, said volunteer Amy Simmons. She is expecting a large turnout this year.

www.opportunitywinchester.org.

— Contact Teresa Dunham at tdunham@winchesterstar.com

Monday, October 2, 2006

Festival spotlights nonprofits and local government

By Suzanne E. Wilder
The Winchester Star

WINCHESTER — Rain and a slight chill in the air did not stop Pete Serafin on Saturday.

Despite the weather, the Winchester City Market volunteer and his 3-year-old daughter Lulu camped out on Loudoun Street to recruit other volunteers for the market.

Lulu, dressed in bright pink fleece clothing, smiled and played with a balloon under a tent.

Serafin said he was trying to get people interested in supporting local vegetable vendors by getting involved with the market.

If the area can support two Wal-Marts and four Martin's grocery stores, can't they also support a homegrown produce market, he asked.

His interest in community involvement and volunteerism was part of the 3rd annual Opportunity Winchester Street Festival.

Opportunity Winchester is a community group trying to create goals for the city.

The group surveyed city residents two years ago.

Based on those results and a subsequent vote, they came up with six focus areas: downtown, housing, recreation, safety/crime, transportation, and youth needs.

The community group is trying to hire a part-time coordinator who will work with the city and nonprofits to fill the needs or wants of the citizens in those areas, said Jim Lawrence, a member of Opportunity Winchester.

Saturday, Lawrence said, was a chance to target the spirit of volunteerism in the area.

People who attended the street festival could visit booths for local nonprofits and government representatives.

City employees — including workers from Parks and Recreation and the Office of Housing and Neighborhood Development — were scattered around Loudoun Street.

City officials said they were pleased with the turnout, considering the overcast skies and the slight chill in the air.



Jivan Wolfe, 7, tries to see through a periscope held by Sgt. Doug Watson of the Winchester Police Department during the Opportunity Winchester Street Festival on Saturday. The sergeant was manning a display set up by the police department. Jivan's brother, Jezzroy, 11, is at the left. The two were at the event with their parents, Stephen Fretwell and Jazz Wolfe of Winchester.
(Photo by Rick Foster)

Organizers had planned for 56 tables, but only about 30 groups came out in the rainy morning.

Pastor Mark Lestik, from Maranatha Fellowship Foursquare Church, was one of the nonprofit representatives who braved the misty weather for the festival.

He was out “to plant seeds” for people who might be looking for a church, he said.

Lestik had a theme for the day: “Do you need a lifesaver?” The phrase alluded to Jesus, but Lestik and his son Greg also handed out Lifesaver mints to passersby.

The festival was slated to include live music from two bands, but the musicians cancelled, citing the wet weather. But that didn't stop a martial arts group from doing a demonstrating.

And two men from a new store on Loudoun Street — Incredible Flying Objects — walked around juggling swords and other flying objects.

Dolores Witherall, from Winchester, and three of her relatives were out Saturday to shop and visit the tables on Loudoun Street.

Her son Robbie was the least enthusiastic about the day.

But for Marquette Mitchell, Dolores's sister-in-law, and Autumn Only, Mitchell's daughter, the day was a chance to catch up with friends who they saw downtown.

Witherall said she had found useful information about recycling.

Though the weather was better when she came out last year, Witherall said the day was still informative and fun.

— Contact Suzanne E. Wilder at
sewilder@winchesterstar.com

Friday, October 6, 2006

Green Circle Fitness Fair planned

By Val Van Meter
The Winchester Star

WINCHESTER — The local area has something unique, and Woodward Bousquet would like to show it to you.

From 10 a.m. until noon on Saturday, Bousquet, professor of environmental studies and biology at Shenandoah University, will show interested visitors the wonders of the Abrams Creek Wetlands Preserve.

His conducted tour is part of the third annual Green Circle Fall Fitness Fair, which will offer a number of ways to get closer to nature, including bird walks, a 5K run, bicycle tours, and a bike safety rodeo.

All events begin at the Children of America parking lot in the Abrams Creek Shopping Center at 631 W. Jubal Early Drive.

The events will highlight the Green Circle Project, a series of hiking and biking trails being built along Town Run and Abrams Creek to encircle Winchester and link parks, neighborhoods, and tourist attractions.

“We want to promote a healthy and active lifestyle,” said Brad Veach, director of the Winchester Parks and Recreation Department, a sponsor of the event. And, he said, the annual event is a good way to promote awareness of the Green Circle Project.

The Abrams Creek Wetlands Preserve, he added, “is a gorgeous place to go and walk.”

“What’s special about the wetlands preserve,” Bousquet said, “is that over a dozen plants on the Virginia Rare Plant List are found there. We’ll see several of them.”

In fact, he said, Virginia has three flowering plants that can be seen only in the Abrams Creek preserve, including one variety of sedge and a type of aster.

“The Virginia Natural Heritage Program has been studying them since 1980,” Bousquet said, adding that fall is the best time to see wildflowers in the preserve.

While woodland wildflowers usually put on their show in spring, when leafless trees let sunlight into the forest floor, wetlands plants are on a different schedule.

“Marsh plants take all summer to grow,” Bousquet said. They don’t do their flowering until fall.”

For more information about the Green Circle events, call the Winchester Department of Parks and Recreation at 540-662-4946. Online registration for the running events can be completed at www.winchestergreencircle.com

Students Fuel Up on Science

Reported by Melinda Pryor
October 12, 2006

More than 500 students from in and around the Shenandoah Valley came to James Madison University for National Alternative Fuel Vehicle Day.



Air and water pollution was on the lesson plan for elementary, middle and high school students as they spent Thursday morning learning from JMU science and technology professors. The students took part in hands-on experiments that measured air and water quality. They also learned the benefits of having a green roof.

Christie Brodrick, asst. prof: "We're promoting the use of alternative fuels for bettering the environment, for promoting sustainability, solutions that last generations," stated Brodrick, assistant science and technology professor.

Some solutions are as simple as keeping your car tires inflated to conserve energy.



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Middle And High Schoolers Discover Alternative Fuels

Posted 2006-10-13

By Dan Kipperman



Chuck McCarty, alternative fuel coordinator at James Madison University, has Millbrook High School student Cody Surface, 16, smell a bottle of biodiesel fuel Thursday. As part of National Alternative Fuels Day, middle and high school students from across the area went to JMU for environment improvement presentations.

Photo by Thomas J. Turney

HARRISONBURG — More than 300 middle and high school students took part in an alternative fuels field trip on the campus of James Madison University on Thursday.

The students from schools as far away as Frederick County and as close as Turner Ashby High walked through JMU's campus, stopping at different stations with lessons on air quality, water quality, wind energy and alternative fuels.

What They Did

Students listened to presentations given by students in the Integrated Science and Technology program.

Katie Lewis, a 14-year-old seventh-grader at Grace Christian, was interested in the discussion about green roofs.

"There are so many things you can do on a roof," she said. "I never thought about it."

ISAT professor Chris Bachmann said designers could build turf, trees and even golf courses on the tops of buildings.

"Not only does it give the building a much better feel aesthetically," he said. "There are environmental benefits that go along with it."

Bachmann said that a "green" roof allows CO₂ to be absorbed when a standard concrete roof would keep the air stale.

At another station, Joey Lucas, a 14-year-old eighth grader at Elkton Middle School, discovered the benefits of a hybrid car.

"That was really cool," he said. "The car was running and I couldn't even tell because it was so quiet. When I buy a car, I want it to be a hybrid."

Importance Of Kids

Throughout the day, students were impressed with what they viewed at the various stations.

One item that excited many of the kids was a hovercraft built by ISAT students.

Although the kids on the field trip could not ride the vehicle, they found out its many capabilities.

The hovercraft, ISAT students explained, can travel up to 30 miles per hour and can hover more than two feet above the ground. More importantly, it runs on bio-diesel, a clean-burning alternative fuel made from vegetable oil.

Bachmann noted how important it was for kids to learn about the environment and how they can protect it.

"At the rate the world consumes oil now, we're going to run out of it in 40 years," he said. "That's a fact. There's just no way around it. If we can get to people before they buy the big cars and before they make their commutes without carpooling, hopefully we can change the way people think."

Contact Dan Kipperman at 574-6274 or dkipp@dnronline.com

JMU NEWS

TOWERING ACHIEVEMENT: DATA COLLECTION TO TAKE A MEASURE OF VALLEY AIR

From: Media Relations

October 19, 2006

HARRISONBURG — The first of a proposed network of solar-powered towers bearing instruments to gauge air quality and other meteorological factors will begin operating Monday, Oct. 23, at the Blandy Experimental Farm located in the northern Shenandoah Valley.

U.S. Rep. Frank Wolf of Virginia's 10th District will be on hand for the kickoff of tower operations at 4 p.m. at [Blandy Experimental Farm](#), a 700-acre research facility operated by the University of Virginia and home to the State Arboretum of Virginia. The congressman was instrumental in securing funds for SHENAIR from the National Weather Service, which is part of the National Oceanic and Atmospheric Administration.

Data from the first SHENAIR tower will be used in research and forecasting models for air quality in Shenandoah Valley region and will be accessible to the public via a Web site.

The Shenandoah Valley Air Quality Initiative, or [SHENAIR](#), with headquarters at James Madison University in Harrisonburg, is a government/university/business alliance aimed at addressing air quality issues in the Valley. With a science-based, regional response, the grassroots organization's goal is to understand the effect of air quality on the health and economy of the Valley and to recommend strategies for improving air quality.

The Blandy tower — solar-powered to minimize its environmental "footprint" — will measure air temperature and moisture, wind direction and speed, precipitation and air pressure. Other sensors will be added in the next year to measure such variables as particulate matter and ozone. Blandy Experimental Farm is located about 10 miles east of Winchester.

Data from the SHENAIR tower will augment observation stations of other Virginia and national agencies such as Virginia Department of Environmental Quality and the National Weather Service. Similar regional studies are being conducted in New England and in the Smokey Mountains of Tennessee.

The tower and instruments were purchased from IPS Meteostar; the Texas company also installed the tower, and will post data collected from the Virginia site on its Web site.

The SHENAIR institute at JMU manages the program that includes work at JMU,

Virginia Tech and UVA. A Local Government Committee, chartered by the Northern Shenandoah Valley Regional Commission, of elected officials from the Valley oversees general planning for SHENAIR.

Tuesday, October 24, 2006

Air quality tower, information kiosk dedicated in Clarke

Solar-powered unit measures temperature, moisture, wind, air pressure

By Robert Igoe
The Winchester Star

BOYCE — Two new Clarke County attractions were dedicated on Monday, with an assist from Rep. Frank R. Wolf.

He visited the Blandy Experimental Farm to dedicate the SHENAIR tower for the Shenandoah Valley Air Quality Initiative. Based at James Madison University, the organization will use the tower to research and forecast air quality.

“I want to see this area’s beauty preserved for our children and their grandchildren,” said Wolf, R-10th, who is seeking re-election on Nov. 7 against Democrat Judy Feder, dean of Georgetown University’s Public Policy Institute; Libertarian Wilbur Nathaniel Wood III of Berryville; and Neeraj Nigam, an independent. “We need to be as proactive as we can to preserve this quality, but it is something that must be done on a regional basis.”

The solar-powered tower will measure air temperature, as well as moisture, wind speed, wind direction, precipitation, and air pressure.

“This tower will be an important contribution and benefit to all of our programs here and a major benefit to the community,” said David Carr, Blandy Experimental Farm curator. “The decisions that will be made from this data will go a long way in ensuring this area continues to be a healthy place to live.”

Clarke County Board of Supervisors Chairman John Staelin said Wolf’s efforts to secure funding for the project are an example of his concern for the area’s environmental quality.

“Congressman Wolf has been very supportive of environmental issues in this county,” he said. “We certainly thank him for that, and we know this project will help in both the study of air and water quality.”

Earlier in the day, Wolf made an appearance at the Clarke County Historical Museum to dedicate an information kiosk.

The kiosk, which can be transported to special events, will feature details of local historic and cultural attractions.

“Clarke County history starts in the 1620s, which means that it goes back almost to the very beginnings of American history,” he said. “It’s very important to realize that.”

— Contact Robert Igoe at
rigoe@winchesterstar.com

Tiffany Newbold (left) and Christy Joy Broderick of James Madison University talk with David Taylor



of
the Virginia Department of Environmental Quality on Monday at the
State Arboretum of Virginia near Boyce during the dedication of the
SHENAIR tower.
(Photo by Scott Mason)

A Towering Achievement

Author(s): DAN KIPPERMAN, Daily News-Record

Date: October 24, 2006

Section: Valley Virginia

HARRISONBURG - Information from a new solar-powered **tower** will allow local researchers to collect weather data with the push of a button. Meteorological information will travel instantly from the **tower**, located in Boyce, to offices at James Madison University, officials say.

JMU assistant professor Christie Joy Brodrick says data from the **tower** will be directed to a Website that will allow her to research air quality information.

"Our mandate is to improve the amount of data we look at," she said. "This **tower** will definitely help us in that regard."

Brodrick is a member of SHENAIR (The Shenandoah Valley Air Quality Project). The group was formed to address air quality issues in the Valley.

The **tower**, which began operating Monday, will collect temperature, wind speed, wind direction, air pressure and precipitation.

"I want to see this area's beauty preserved for our children and their grandchildren," said U.S. Rep. Frank Wolf, R-10th, who attended Monday's dedication of the SHENAIR **Tower** at Blandy Experimental Farm in Boyce. "We need to be as proactive as we can to preserve this quality, but it is something that must be done on a regional basis."

SHENAIR program manager Tiffany Newbold said other **towers** will be added in the next year to measure air pollutants like ozone.

"We're excited to get this started," she said. "This is a big step for us and we hope there will be many more."

SHENAIR officials will send the data to other Virginia and national agencies such as the Virginia Department of Environmental Quality and the National Weather Service.

"Our purpose is to understand the origin of air pollution," Brodrick said. "There are a lot of assumptions of where pollution is coming from but we want to be sure of what we're dealing with."

Advantages

Brodrick said the new **tower** would help with pollution in two ways: by recording air data effectively and by saving fossil fuels through the use of solar power.

"Our job is to find ways to improve the environment," she said. "Having a solar-powered **tower** makes sense."

Solar power uses energy from the sun, rather than burning non-renewable sources.

"Any time we can do something to improve the environment, we jump at the chance," Brodrick said.

Newbold said the rest of the **towers**, to be located anywhere from Winchester to Roanoke, will also be solar-powered.

Contact Dan Kipperman at 574-6274 or dkipp@dnronline.com

Citizens give ideas on paths

MPO continues work on bike and pedestrian needs

By Mark R. Dorolek
The Winchester Star

WINCHESTER — Several residents have offered ideas and support for local bicycle and pedestrian paths.

The Winchester-Frederick County Metropolitan Planning Organization's staff met with citizens at Our Health headquarters on Monday to gather information for its Bicycle and Pedestrian Mobility Plan.

Residents were encouraged to speak with the staff members, MPO officials, and representatives of Toole Design Group of College Park, Md., which is formulating the plan.

The plan's project manager, Jennifer Hefferan of Toole, said she has talked with local business leaders, police officials, and members of the MPO Steering Committee, and has visited the area to see where bicycle and pedestrian paths are needed.

Hefferan said she hopes to gather information from residents and use the information from an online poll set up by the MPO to determine the direction of the plan and the appropriateness of the firm's proposals.

In the poll, residents identified Senseny Road, Valley Avenue, Pleasant Valley Road, Amherst Street, Middle Road, Greenwood Road, and Cedar Creek Grade as thoroughfares most in need of bicycle or pedestrian paths.

Max and Nancy Weaver of Winchester said they are avid walkers and advocates for Winchester's Green Circle Project and were glad to hear about the MPO's plan. "We respect and support them any way we can," Nancy Weaver said.

If the area becomes more attractive to bicyclists, cyclist Leonard Yang of Winchester said, it would help the economy by bringing more people in to ride their bikes. He also said if the area becomes more friendly to cyclists, it would help families to get some exercise and keep children in shape.

Mark Brewer of Middletown, who works for a contractor, said he would ride his bicycle into Winchester if he had to work there for the day. "Winchester has no semblance of paths for riding."

Once the MPO Policy Committee approves the plan, Stephen W. Kerr, the executive director of the Northern Shenandoah Valley Regional Commission and the secretary of the planning organization, said it will look to the development community to implement it. He said the plan



Winchester residents Max (left) and Nancy Weaver study a map of proposed bicycle and pedestrian improvements with Stephen W. Kerr, executive director of the Northern Shenandoah Valley Regional Commission, during a public open house for the Winchester-Frederick Metropolitan Planning Organization's Bicycle and Pedestrian Mobility Plan on Monday. (Photo by Jeff Taylor)

allows Winchester and Frederick County officials to show developers the plans for certain areas and to persuade them to add the paths. “We have the information to justify the projects,” Kerr said, adding developers will not participate if they don’t see specific plans. He said the plan will allow the MPO to apply for grants to pay for some projects, because it has shown an effort to set up the paths.

Contact Mark R. Dorolek at
mdorolek@winchesterstar.com



Tiffany Turner, air quality outreach coordinator with SHENAIR (left), and Lynn Radocha, ISAT outreach administrator, test soil samples Tuesday, Nov. 14, for levels of nitrogen, phosphorus and potassium. The exercise was part of a two-day training program to learn methods for teaching the [GLOBE](#) (Global Learning and Observations to Benefit the Environment) curriculum to future teachers in JMU's interdisciplinary studies program. The training took place in the ISAT/CS building.

EPA Newsroom

Early Smog Reductions in 14 U.S. Communities

Release date: 11/27/2006

Contact Information: John Millett, (202) 564-4355 / millett.john@epa.gov

(11/27/06) Fourteen communities across the United States remain ahead of schedule in the effort to reduce ground-level ozone -- or smog -- as part of a program that encourages steps to protect air quality. The progress these areas have made under EPA's Early Actions Compacts program puts them on track to meet clean air requirements one to two years sooner than required.

Early Action Compacts provide a strong incentive for state and local governments, civic leaders and business interests to develop innovative, cost-effective strategies for improving ozone air quality in ways that are tailored to individual communities. Fifteen additional Early Action Compact areas already meet the 8-hour ozone standard, but chose to join the compact to ensure that they stay in attainment while continuing voluntary steps to protect the health and quality of life in their communities.

Today's final rule changes the date Clean Air Act Requirements would take effect for 13 Early Action Compacts from Dec. 31, 2006 to April 15, 2008 and to July 1, 2007 for the Denver area. If all these areas meet the 8-hour standard for ground-level ozone by Dec. 31, 2007, which they are on track to do, they will be designated as in attainment. The areas are: Frederick County/Winchester, Va.; Roanoke area, Va.; Washington County/Hagerstown, Md.; Berkeley & Jefferson Counties, W.Va.; Hickory-Morganton-Lenoir area, N.C.; Greensboro-Winston-Salem-High Point area, N.C.; Fayetteville, N.C.; Greenville-Spartanburg-Anderson, S.C.; Columbia area, S.C.; Chattanooga area, Tenn./Ga.; Nashville area, Tenn.; Johnson City-Kingsport-Bristol area, Tenn.; San Antonio area, Texas; and Denver-Boulder-Greeley-Ft. Collins-Love area, Colo.

[Information on the rule: epa.gov/oar/eac/](http://epa.gov/oar/eac/)

[Fact sheet: epa.gov/oar/eac/fs20061122_eac.html](http://epa.gov/oar/eac/fs20061122_eac.html)

Appendix D

Live-Read Public Service Announcements

PUBLIC SERVICE ANNOUNCEMENT

Preferred release period:
Monday, July 17, 2006, through Monday, July 24, 2006

TITLE: Summer Road Trip

LENGTH: 45 seconds

LIVE READ RADIO PSA.....

Planning a road trip? When you hit the highway this summer, remember these tips to help save money *and* clean the air. When you gas up, don't top off. Stop when you hear the click and you'll prevent air-polluting gas spills—on you and the ground. Also, refuel in the evening, when it's cooler outside. Gassing up in the summer heat generates air-polluting vapors. But, if you fill up at night, doing your part is easy! So keep it up, because it all adds up to cleaner air.

Sponsored by Valley AIRNow and the Federal Highway Administration.

Appendix E

Air Quality Action Day Program
Sample Press Releases

OZONE ALERT II CODE ORANGE!

for
Sunday, June 18, 2006

This is a notice that weather conditions are favorable for a **Code Orange Air Quality Alert** in the **Winchester/Frederick County** area on **June 18**.

What does this mean?

The Valley AIRNow Air Quality Outreach Program issues air quality alerts when it is predicted the region's air quality may be harmful to the public in the afternoon and early evening hours. Our primary pollutant is ground-level ozone. An Air Quality Index over 100 indicates pollution in the atmosphere is considered unhealthy for sensitive groups and merits a Code Orange Alert (see below).

What should the GOVERNMENT do?

- First, **share this alert** within your office immediately!
- For active children and adults, **limit or reduce outdoor activity** during the afternoon and early evening hours. Ozone can irritate your respiratory system, reduce lung function, and aggravate asthma – and ozone damage to your body can occur without obvious symptoms.
- For those with **compromised respiratory systems**, limit outdoor activity.
- As always, encourage such activities as **carpooling** and **bicycling** among staff to reduce ground-level ozone.
- **Refuel fleets and other government transportation in the evening** to limit fumes mixing with sunlight to produce harmful ozone.
- Keep government and personal vehicles well maintained so they “**run-clean.**”
- **Delay mowing** government grounds or using other heavy equipment that may emit pollution.
- **Limit your use of oil-based paints**, which contain significantly higher amounts of ozone-producing solvents than traditional water-based paints.
- Visit **www.valleyairnow.com** for more tips!

Where we stand

The Air Quality Index offers a spectrum of color-coded conditions to alert us about pollutants in the air.

	GREEN – Good (0-50)
	YELLOW – Moderate (51-100)
	ORANGE – Unhealthy for Sensitive Groups (101-150)
	RED – Unhealthy (151-200)

Questions? Visit www.valleyairnow.com or contact us at 540.450.2207

1 + 1 + 1 + 1 ... = cleaner air

It takes only **one** person making **one** change in **one** task **one** day.

OZONE ALERT II CODE ORANGE!

for
Thursday, August 5, 2004

This is a notice that weather conditions are favorable for a **Code Orange Air Quality Alert** in the **Winchester/Frederick County** area on **August 5**.

What does this mean?

The Valley AIRNow Air Quality Outreach Program issues air quality alerts when it is predicted the region's air quality may be harmful to the public in the afternoon and early evening hours. Our primary pollutant is ground-level ozone. An Air Quality Index over 100 indicates pollution in the atmosphere is considered unhealthy for sensitive groups and merits a Code Orange Alert (see below).

What should EMPLOYERS do?

- First, **share this alert** within your business community immediately!
- For active children and adults, **limit or reduce outdoor activity** during the afternoon and early evening hours. Ozone can irritate your respiratory system, reduce lung function, and aggravate asthma – and ozone damage to your body can occur without obvious symptoms.
- For those with **compromised respiratory systems**, limit outdoor activity.
- As always, encourage such activities as **carpooling** and **bicycling** among staff to reduce ground-level ozone. Allow employees to **telework**.
- **Refuel fleets and other company transportation in the evening** to limit fumes mixing with sunlight to produce harmful ozone.
- **Delay mowing** corporate grounds or using other heavy equipment that may emit pollution.
- **Limit your use of oil-based paints**, which contain significantly higher amounts of ozone-producing solvents than traditional water-based paints.
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What should the EDUCATION COMMUNITY do?

- First, **share this alert** within your school community immediately!
- For active children and adults, **limit or reduce outdoor activity** during the afternoon and early evening hours. Ozone can irritate your respiratory system, reduce lung function, and aggravate asthma – and ozone damage to your body can occur without obvious symptoms.
- For those with **compromised respiratory systems**, limit outdoor activity.
- As always, encourage such activities as **carpooling** and **bicycling** among staff to reduce ground-level ozone.
- **Refuel buses and other school transportation in the evening** to limit fumes mixing with sunlight to produce harmful ozone.
- **Delay mowing** school grounds or using other heavy equipment that may emit pollution.
- **Limit your use of oil-based paints**, which contain significantly higher amounts of ozone-producing solvents than traditional water-based paints.
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OZONE ALERT II CODE ORANGE!

for
Thursday, May 1, 2005

This is a notice that weather conditions are favorable for a **Code Orange Air Quality Alert** in the **Winchester/Frederick County** area on **May 1**.

What does this mean?

The Valley AIRNow Air Quality Outreach Program issues air quality alerts when it is predicted the region's air quality may be harmful to the public in the afternoon and early evening hours. Our primary pollutant is ground-level ozone. An Air Quality Index over 100 indicates pollution in the atmosphere is considered unhealthy for sensitive groups and merits a Code Orange Alert (see below).

What should the MEDIA do?

- First, **share this alert** within the public immediately!
- For active children and adults, **limit or reduce outdoor activity** during the afternoon and early evening hours. Ozone can irritate your respiratory system, reduce lung function, and aggravate asthma – and ozone damage to your body can occur without obvious symptoms.
- For those with **compromised respiratory systems**, limit outdoor activity.
- As always, encourage such activities as **carpooling** and **bicycling** among staff to reduce ground-level ozone. Urge employers to allow employees to **telework**.
- Remind everyone to **refuel vehicles in the evening** to limit fumes mixing with sun light to produce harmful ozone - and don't "top off" the tank, allowing fumes to escape.
- Direct businesses and individuals to **delay mowing** with gas-powered mowers or using other heavy equipment that may emit pollution.
- Ask the public to **avoid drive-through windows** at restaurants, banks, cleaners, etc.
- An idling engine can emit pollution into the air
- **Visit www.valleyairnow.com** for more tips!

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What should the HEALTH community do?

- First, **share this alert** within your health community immediately!
- For active children and adults, **limit or reduce outdoor activity** during the afternoon and early evening hours. Ozone can irritate your respiratory system, reduce lung function, and aggravate asthma – and ozone damage to your body can occur without obvious symptoms.
- For those with **compromised respiratory systems**, limit outdoor activity.
- As always, encourage such activities as **carpooling** and **bicycling** among staff to reduce ground-level ozone. Allow employees to **telework**.
- **Refuel fleets and other company transportation in the evening** to limit fumes mixing with sunlight to produce harmful ozone.
- **Delay mowing** corporate grounds or using other heavy equipment that may emit pollution.
- **Limit your use of oil-based paints**, which contain significantly higher amounts of ozone-producing solvents than traditional water-based paints.
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What should the Freight Industry do?

- First, **share this alert** within your trucking community immediately!
- **Limit engine idling**. Turn off the engine when stopped for more than a few minutes to reduce exhaust mixing with sunlight to produce harmful ozone.
- **Refuel fleets and other company transportation in the evening** to limit fumes mixing with sunlight to produce ozone.
- **Don't top off the tank** to avoid releasing gas fumes into the air and producing ozone.
- For active children and adults, **limit or reduce outdoor activity** during the afternoon and early evening hours. Ozone can irritate your respiratory system, reduce lung function, and aggravate asthma – and ozone damage to your body can occur without obvious symptoms.
- For those with **compromised respiratory systems**, such as heart disease, lung disease, or asthma, limit the amount of time spent outdoors.
- Visit www.valleyairnow.com for more tips!

Where we stand

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Appendix F

Valley AIRNow Materials Development

October 20, 2006

Dear Chamber Partner:

As you may be aware, Winchester City and Frederick County are participating in a voluntary, proactive, EPA-approved initiative for improving local air quality. Clearly you, as a Chamber partner and business in Winchester or Frederick County, understand the necessity of improving the area's air quality. This is plainly shown by the significant decrease in several air pollutants over the past decades, some of which is partly due to strides made by businesses like yours. We hope you are ready to enhance this proven stewardship by becoming a partner of the Valley AIRCorps program.

What is Valley AIRCorps?

- Valley AIRCorps is the business outreach program of Valley AIRNow. Valley AIRNow is the air quality outreach program for the Winchester and Frederick County area, which is proactively addressing the area's ground-level ozone (a.k.a. smog) pollution problem.
- Partnership in Valley AIRCorps is free, takes very little time, and shows the community you care.

What is involved in becoming a partner of Valley AIRCorps?

- Basic partnership consists of agreeing to receive Air Quality Action Day (AQAD) Alerts by email, fax, or phone and distributing to your employees and customers. These Alerts inform you that the next day's air quality may be harmful to you, your employees, and the rest of the community's residents and businesses.
 - o Each Alert contains important information about:
 - The harmful health risks associated with high concentrations of ground-level ozone, and
 - Suggested activities for reducing emissions.
- Valley AIRNow will also help your business to develop its own unique Air Quality Action Day program.

What are some of the reasons why *your* business should become a partner of Valley AIRCorps?

- Avoid long-term federal regulatory influence on air quality and transportation issues.
- Reduce the possibility of losing Federal and State transportation dollars.
- Save residents and businesses money on gasoline products.
- Most importantly, improve the region's air quality.

What are some of the ways partners of Valley AIRCorps are recognized for their proactive commitment to preserve the region's air quality?

- Valley AIRNow website and various media events.
- In the Chamber's Business Agenda.

How do I sign up?

Joining Valley AIRCorps is easy. You need only visit <http://www.valleyairnow.com/aircorps.htm> for more information or to register online.

Winchester and Frederick County enjoy a high quality of life. In order to ensure this high quality of life continues for years to come, we must work together and do our share to *preserve* our air! If you have any questions, contact Tiffany Tumer via email at tumerta@jmu.edu or by phone at (540) 560-3466.

Sincerely,

Charles Weiss, IOM
President & CEO

Course Description

This workshop will introduce the issues and science surrounding air quality and examine how this content can be used to bring an inquiry and problem solving focus to science instruction. Beginning with meteorology, we will study the components of air and how air moves globally to transport pollutants. Studying the chemistry of air pollution will include examining ozone and particulates in the Shenandoah Valley and what factors influence these pollutants. Indoor air, impacts of air pollution

on human health, regulation of air pollutants, and the technologies used to monitor and control air pollution round out the course

topics. GLOBE instrumentation and protocols will be introduced as tools for inquiry-based air and air quality instruction. Participants will become certified in GLOBE atmosphere protocols. GIS will be introduced as a tool for analyzing scientific problems, and grade appropriate GIS activities will be demonstrated. Participants will learn how to use a free online GIS tool and will begin exploring the use of spatial analysis in science instruction. All participants will receive a grade appropriate set of GLOBE certified scientific instruments to incorporate climate and air quality monitoring into their curriculum.



Content

—This course is designed to accomplish two major goals for the teachers who will participate: increased knowledge of the content defined by the Virginia Standards of Learning and improved instructional delivery of content.

—SOL content will include six of the science strands: scientific investigation, reasoning, and logic; force, motion, and energy; interrelationships in Earth/space systems; resources; matter; and Earth patterns, cycles, and change. Particular emphasis will be placed on SOL related to weather (e.g. 4.6, 6.6, and ES.13), atmosphere (6.6, ES.12), matter and energy (6.2, 6.3, 6.4, PS.2, PS.5), resources (4.8, 6.9, and ES.7), and scientific investigation (4.1, 6.1, PS.1, ES.1, ES.2, and ES.3).

—Three hours of graduate credit will be awarded after the workshop and follow-up activities are completed. Follow-up activities: design 3 lessons utilizing content from the workshop, post these lessons on an electronic bulletin board, review three lessons designed by other participants, complete a practical instructional project, and participate in web-based follow-up. Credit will be earned for ISAT 501 (Integrated Science and Technology: Workshop in Technology)



Workshop Information

—Hours: 8:30 a.m. – 4:45 p.m. (Mon.–Fri.) and two evening sessions (6:30 – 8:30 p.m.)

—Application Requirements: Please submit a brief essay (250 words maximum) about how you would use weather and air quality monitoring equipment and information to incorporate inquiry-based investigations of air quality and meteorology into your science curriculum. Essays should be submitted online at: <https://websurvey.jmu.edu/ss/wsb.dll/radochlm/aqteacherapp.htm> by May 10, 2006. Successful applicants will be informed by May 30th.

—Eligibility: Academy is open only to science teachers in grades 4, 6, 8 and 9 (Earth Science) in the Frederick, Harrisonburg, Rockingham, and Winchester area school districts. Registration is limited to 20 participants.

—Funding/Fees: SHENAIR will pay a \$1,000 (\$600.00 upon completion of workshop and \$400.00 after class implementation) stipend to each participant. Participants are responsible for (optional) graduate or CEU tuition, meals, housing, and transportation costs.

—Lodging: \$100.00 per person for Sun.-Thurs. nights in an air-conditioned, double occupancy dorm room; \$180.00 per person for a single dorm room. Area hotels also are available.

—Questions: Contact Lynn Radocha at radochlm@jmu.edu regarding application, housing, or registration details. Contact Mary Handley at handlemk@jmu.edu regarding course content.

Program Information

"GLOBE (Global Learning and Observations to Benefit the Environment) is a worldwide hands-on, primary and secondary school-based education and science program. GLOBE trains teachers to help students improve their achievement in science and math, and in the use of computer and network technology.

GLOBE improves student understanding of science because it involves them in performing real science - taking measurements, analyzing data, and participating in research in collaboration with scientists."

For more information on the Globe Program, visit http://www.globe.gov/globe_flash.html

"GLOBE is the quintessentially ideal program for involving kids in science," - Nobel laureate Dr. Leon Lederman.

"A geographic information system is a system for management, analysis, and display of geographic knowledge. GIS technology is one of the hottest new tools in education and research and is one of the fastest growing high-tech careers for students today. GIS training helps students develop computer literacy, analytical approaches to problem solving, and communication and presentation skills."

More information can be found at:

http://www.esri.com/getting_started/education/index.html

"GIS engages students and promotes critical thinking, integrated learning and analysis, and multiple intelligences and sciences at any grade level."

"The SHENandoah Valley AIR Quality Initiative (SHENAIR) is a group of citizens, elected officials, educators and regulators whose goal is to integrate economic and comprehensive planning with ecological considerations into a set of decision support tools for public and private planning related to air quality. The program focuses on air quality observing and forecasting programs including the establishment of air quality and meteorological monitoring equipment throughout the Shenandoah Valley, and the utilization of sophisticated computer modeling software and data processing hardware to gather, analyze and disseminate real time and predictive information to local decision makers, research programs, and the general public. This Climate and Air Quality in the Shenandoah Valley workshop is an outreach component of SHENAIR."



Shenandoah National Park is shown under poor (left) and good (right) visibility conditions. The visibility range under poor conditions is 25 km while the visibility range in under good conditions is 180 km. (Photos and data are from Shenandoah National Park.)



The SHENAIR Institute at James Madison University presents:

A summer teaching workshop focused on the science behind

Climate and Air Quality in the Shenandoah Valley

June 26-30, 2006
at James Madison University



For Science Teachers in Grades 4, 6, 8, and 9 who teach in the Harrisonburg, Frederick, Rockingham, and Winchester School Districts

GLOBE Atmosphere Investigations Correlated to Virginia Science Standards of Learning

DRAFT

*Key for K-6 Implementation: ✓ Recommended ☑ Limited ☒ Not recommended

Cloud Cover and Contrail Cover Protocol	☑ K.1, K.2, K.4, K.5, K.8, K.9	☑ 1.1, 1.6	☑ 2.1, 2.6	✓ 3.1, 3.9	✓ 4.1, 4.6	✓ 5.1, 5.3, 5.4	✓ 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.8
Relative Humidity Protocol	☒ K.1, K.2, K.4, K.5, K.8, K.9	☒ 1.1, 1.6, 1.7	☒ 2.1, 2.3, 2.6, 2.7	☑ 3.1, 3.6, 3.8, 3.9	✓ 4.1, 4.4, 4.6	✓ 5.1, 5.4, 5.7	✓ 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.8
Precipitation Protocol	☑ K.1, K.2, K.4, K.5, K.8, K.9	☑ 1.1, 1.3, 1.6, 1.7, 1.8	☑ 2.1, 2.3, 2.6, 2.7	☑ 3.1, 3.6, 3.8, 3.9, 3.10	✓ 4.1, 4.6	✓ 5.1, 5.4, 5.7	✓ 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9
Digital Multi-Day Max/Min and Current Air and Soil Temperature Protocol	☒ K.1, K.2, K.4, K.8, K.9	☒ 1.1, 1.6, 1.7	☑ 2.1, 2.3, 2.5, 2.6, 2.7	☑ 3.1, 3.6, 3.7	✓ 4.1, 4.6	✓ 5.1, 5.4	✓ 6.1, 6.2, 6.3, 6.6, 6.8
Digital Max/Min and Current Air and Soil Temperature Protocol	☒ K.1, K.2, K.4, K.8, K.9	☒ 1.1, 1.6, 1.7	☑ 2.1, 2.3, 2.5, 2.6, 2.7	✓ 3.1, 3.6, 3.7	✓ 4.1, 4.6	✓ 5.1, 5.4	✓ 6.1, 6.2, 6.3, 6.6, 6.8
Current Temperature Protocol	✓ K.1, K.2, K.4, K.7, K.8, K.9	✓ 1.1, 1.6, 1.7	✓ 2.1, 2.6, 2.7	✓ 3.1, 3.8, 3.11	✓ 4.1, 4.6	✓ 5.1, 5.4	✓ 6.1, 6.2, 6.3, 6.6, 6.8
Surface Temperature Protocol	☒ K.1, K.2, K.4, K.7, K.8, K.9	☒ 1.1, 1.6, 1.7	☒ 2.1, 2.6, 2.7	☒ 3.1, 3.8, 3.11	☑ 4.1, 4.6	☑ 5.1, 5.3, 5.4	☑ 6.1, 6.2, 6.3, 6.6, 6.8
Surface Ozone Protocol	☒ K.1, K.2, K.4, K.8, K.9	☒ 1.1, 1.7, 1.8	☒ 2.1, 2.6, 2.7	☒ 3.1, 3.8, 3.10	☒ 4.1, 4.6	☑ 5.1, 5.4	☑ 6.1, 6.2, 6.3, 6.4, 6.6, 6.8, 6.9
Barometric Pressure Protocol	☒ K.1, K.2, K.8	☒ 1.1, 1.7	✓ 2.1, 2.6	✓ 3.1, 3.9	✓ 4.1, 4.6	✓ 5.1	✓ 6.1, 6.3, 6.6,
AWS WeatherNet Protocol	☒	☒	☒	☑ 3.1, 3.6, 3.7	✓ 4.1, 4.6	✓ 5.1, 5.3, 5.4	✓ 6.1, 6.2, 6.3, 6.6, 6.8
Weather Station and Automated Soil and Air Temperature Monitoring Protocols	☒	☒	☒	☑	☑	☑	☑ 6.1, 6.2, 6.3, 6.6, 6.8
Aerosols Protocol	☒	☒	☒	☑	☑	☑	☑ 6.1, 6.2, 6.3, 6.6, 6.8
Water Vapor Protocol	☒	☒	☒	☑	☑	☑	☑ 6.1, 6.2, 6.3, 6.5, 6.6, 6.8

GLOBE Atmosphere Investigations Correlated to Virginia Science Standards of Learning

DRAFT

Cloud Cover and Contrail Cover Protocol	LS.1, LS.7, LS.11	PS.1, PS.2, PS.5, PS.6, PS.7, PS.9	ES.1, ES.2, ES.3, ES.12, ES.13	BIO.1, BIO.9	CH.1, CH.2, CH.5	PH.1, PH.2, PH.3, PH.4
Aerosols Protocol	LS.1, LS.11, LS.12	PS.1, PS.2, PS.6, PS.7, PS.9, PS.11	ES.1, ES.2, ES.3, ES.4, ES.12, ES.13	BIO.1, BIO.9	CH.1	PH.1, PH.2, PH.3, PH.4, PH.8, PH.10, PH.13
Water Vapor Protocol	LS.1, LS.7, LS.11, LS.12	PS.1, PS.2, PS.6, PS.7, PS.9, PS.11	ES.1, ES.2, ES.3, ES.4, ES.12, ES.13	BIO.1, BIO.9	CH.1, CH.5	PH.1, PH.2, PH.3, PH.4, PH.7, PH.8, PH.10, PH.13
Relative Humidity Protocol	LS.1, LS.4, LS.6, LS.7	PS.1, PS.2, PS.7	ES.1, ES.2, ES.3, ES.7, ES.9, ES.13	BIO.1, BIO.3	CH.1, CH.4, CH.5	PH.1, PH.2, PH.3, PH.4, PH.7
Digital Multi-Day Max/Min and Current Air and Soil Temperature Protocol	LS.1, LS.7, LS.10, LS.11, LS.12	PS.1, PS.2, PS.7	ES.1, ES.2, ES.3, ES.7, ES.13	BIO.1, BIO.9	CH.1	PH.1, PH.2, PH.3
Digital Max/Min and Current Air and Soil Temperature Protocol	LS.1, LS.7, LS.10, LS.11, LS.12	PS.1, PS.2, PS.7	ES.1, ES.2, ES.3, ES.7, ES.13	BIO.1, BIO.9	CH.1	PH.1, PH.2, PH.3
Current Temperature Protocol	LS.1, LS.7, LS.11, LS.12		ES.1, ES.2, ES.3, ES.13	BIO.1, BIO.9	CH.1	PH.1, PH.2, PH.3, PH.4
Surface Temperature Protocol	LS.1, LS.7, LS.11, LS.12	PS.1, PS.2, PS.6, PS.7, PS.9	ES.1, ES.2, ES.3, ES.13	BIO.1, BIO.9	CH.1	PH.1, PH.2, PH.3, PH.4, PH.10
Surface Ozone Protocol	LS.1, LS.4, LS.7, LS.11, LS.12	PS.1, PS.2, PS.4, PS.5, PS.6, PS.7	ES.1, ES.2, ES.3, ES.12, ES.13	BIO.1, BIO.9	CH.1, CH.2, CH.3	PH.1, PH.2, PH.3, PH.4
Barometric Pressure Protocol	LS.1, LS.11	PS.1, PS.7	ES.1, ES.2, ES.3, ES.13	BIO.1, BIO.9	CH.1, CH.4, CH.5	PH.1, PH.2, PH.3, PH.4, PH.7
AWS WeatherNet Protocol	LS.1, LS.7, LS.10, LS.11, LS.12	PS.1, PS.2, PS.7	ES.1, ES.2, ES.3, ES.7, ES.13	BIO.1, BIO.9	CH.1	PH.1, PH.2, PH.3, PH.4
Weather Station and Automated Soil and Air Temperature Monitoring Protocols	LS.1, LS.7, LS.10, LS.11, LS.12	PS.1, PS.2, PS.7	ES.1, ES.2, ES.3, ES.7, ES.13	BIO.1, BIO.9	CH.1	PH.1, PH.2, PH.3
Precipitation Protocol	LS.1, LS.4, LS.7, LS.10, LS.11, LS.12		ES.1, ES.2, ES.3, ES.7, ES.9, ES.13		CH.1, CH.4, CH.5	PH.1, PH.2, PH.3, PH.4, PH.7

What You Can Do

Whether you are a truck owner, driver, or other member of the freight industry, there are several simple, yet effective steps you can take to reduce engine wear, improve air quality, and save money!

1. **Turn off your engine when your vehicle is not in motion.** Remember, an idling engine gets zero miles to the gallon! A typical long-haul combination truck that eliminates unnecessary idling could save up to 1,900 gallons of fuel each year and approximately \$4,500 in fuel costs, lowers engine maintenance costs, requires fewer engine overhauls per miles traveled, and improves air quality.
2. **Follow the manufacturer's recommendation for minimum warm-up time.** Today's diesel engines do not need to idle for long periods of time before and after driving. Most engine manufacturers recommend that newer engines run for roughly 3 to 5 minutes before driving, depending upon your vehicle.
3. **Keep your engine well tuned and maintained.** Regular maintenance and tune-ups improve gas mileage, extend the life of your truck, and improve air quality.
4. **Get fuel when it's cool.** Refueling your truck during cooler periods of the day or in the evening can prevent gas fumes from heating up and creating ozone, or smog.
5. **Don't top off the tank.** It releases gas fumes into the air and cancels the benefits of the pump's anti-pollution devices. So stopping short of a full tank is safer for you and reduces pollution.
6. **Fill up your tank with biodiesel.** Trucks running on biodiesel smell better, produce fewer emissions, and significantly improve the lubrication of engine components. For more information on biodiesel and where to gas up, visit www.biodiesel.org/
7. **Stay informed.** Check for air quality forecasts in Virginia on a daily basis by visiting www.deq.state.va.us/airquality/. On Code Orange Days, do your share to protect the air by eliminating as much idling as possible.

Clean Diesel Network

Join the Shenandoah Valley Clean Diesel Network! It's free and easy to sign up, and it takes very little time to manage. Become a member of the Clean Diesel Network (CDN) for the Shenandoah Valley by enrolling you or your trucking company at: www.valleyairnow.com/cdnregistration.htm.

Upon enrollment in CDN, you will enjoy the following membership benefits:

- Alerts via email or fax on Code Orange Days (on average, only 1 to 2 days per summer) to inform you and/or your employees of days when ozone concentrations are expected to exceed safe levels;
- Publicity on the Valley AIRNow website as well as at local events;
- Recognition in local media resources;
- Educational posters and brochures to display around your facility;
- Bumper stickers to place on your trucks advertising your participation and dedication to improving air quality in the Valley;
- Annual awards of appreciation and exemplary service to the community.

By joining the Network, we ask only that you help spread the word and disseminate any Code Orange Alerts to employees or other independent drivers. Help educate others on the health risks associated with the Alert, and educate them on ways to reduce ozone-forming emissions every day, including avoiding idling. Your participation in the Network will demonstrate your commitment to improving air quality in the Shenandoah Valley and protecting the health of your community.

For more information, visit www.valleyairnow.com/cleandieselnetwork.htm or contact Tiffany Turner at tumerta@jmu.edu.

valleyairnow



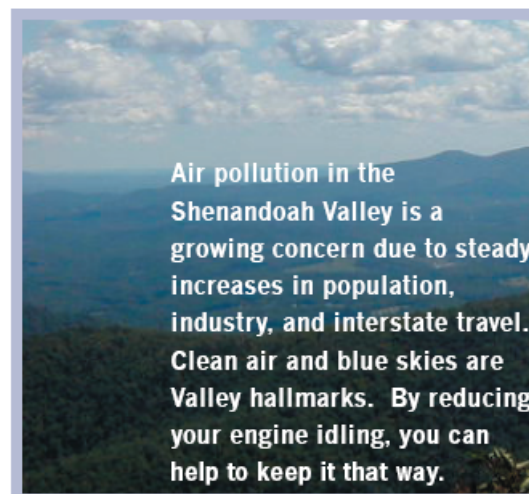
ENGINE WEAR

HEALTH RISKS

ENGINE
POLLUTION
IDLING

WASTED FUEL

WASTED MONEY

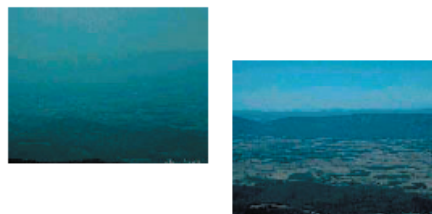


Air Pollution

The Shenandoah Valley of Virginia, nestled between the Blue Ridge and Allegheny Mountains, stretches for approximately 150 miles from Martinsburg, West Virginia, to Roanoke, Virginia. Renowned for its varying geology, scenic views, and agricultural productivity, the Valley consists of a network of cities and towns that are connected by Interstate 81—a heavily trafficked corridor that has become a major route for interstate truck transportation in recent years.

Air pollution in the Shenandoah Valley is a growing concern due to steady increases in population, industry, and interstate travel.

Consequently, several localities in the Valley are currently being monitored for ground-level ozone—the main ingredient in smog. These areas include Page County, Rockbridge County, the Roanoke Metropolitan Statistical Area (MSA), Shenandoah National Park, Winchester City-Frederick County, and the Eastern Panhandle in West Virginia. Of these six areas, three were recently identified as being in potential non-attainment with the new Environmental Protection Agency (EPA) 8-hour ozone standard of 85 parts per billion (ppb)—Roanoke MSA, Winchester City-Frederick County, and West Virginia's Eastern Panhandle. To avoid federal non-attainment status, these localities entered into Early Action Compacts in 2002 to reduce pollutants and improve air quality in a proactive manner.



Shenandoah National Park is shown under poor (left) and good (right) visibility conditions. The visibility range under poor conditions is 25 km while the visibility range in under good conditions is 180 km. (Photos and data are from Shenandoah National Park.)

Diesel Engine Idling

Today, Interstate 81 serves as one of the most important transportation corridors on the East Coast and is the



Photo courtesy of Virginia Department of Transportation

route for a large majority of the truck traffic in the Shenandoah Valley. Regularly listed as one of the top eight trucking routes in the United States, trucks account

for 20% to 40% of the total traffic on I-81. On some sections, the number of trucks nearly equals the number of passenger cars. This interstate traffic is essential to the economic vitality of the Valley; however, there is increasing concern about the health effects associated with exposure to diesel exhaust. Reduction in engine idling is one way to cut back on this exhaust.

Idling vehicles emit significant amounts of pollution. Ozone, or smog, is one of these pollutants. It forms when sunlight reacts with emissions from cars and trucks. The worst time of the year for ozone is May through October—when temperatures are highest, and the amount of sunlight is greatest. During this time, ozone forecasts are reported to the public using the Air Quality Index, or the AQI. The AQI is a daily color-coded index that tells you how clean or polluted your air is and what associated health effects might be a concern for you.

AIR QUALITY INDEX VALUES AND LEVELS OF CONCERN	ACTION GUIDE
GREEN GOOD 0-50	None
YELLOW MODERATE 51-100	Unusually sensitive people should consider reducing prolonged or heavy exertion outdoors.
ORANGE UNHEALTHY FOR SENSITIVE GROUPS 101-200	Active children and adults, and people with lung disease, such as asthma, should reduce prolonged or heavy exertion outdoors.
RED UNHEALTHY 201-300	Active children and adults, and people with lung disease, such as asthma, should avoid prolonged or heavy exertion outdoors.
PURPLE VERY UNHEALTHY 301-500	Active children and adults, and people with lung disease, such as asthma, should avoid all outdoor exertion. Everyone else, especially children, should avoid prolonged or heavy exertion outdoors.

Why Be Concerned?

Increased Truck Costs

If you drive or own a diesel vehicle, you should be aware of the following significant problems associated with idling:

- **Wasted fuel and money.** A typical truck burns approximately one gallon of diesel fuel for each hour it idles. If this truck idles for 6 hours per day (300 days a year) at the price of about \$2.25 per gallon of diesel, this idling comes with a price tag of an estimated \$4,500 per truck!
- **Excessive engine wear.** Compared to driving at regular speeds, running an engine at low speed (idling) causes twice the wear and tear on the engine's internal parts. According to the American Trucking Association, such wear can increase maintenance and overhaul costs by nearly \$2,000 per year and can shorten the life of the engine.
- **State regulations.** Fines of several hundred dollars per idling violation are now being collected by a growing number of states. In Virginia, you can be fined for idling longer than 10 minutes in commercial or residential urban areas.

Public Health

Air pollution as a result of idling can pose health risks to everyone, including:

- **Children.** Breathing ozone produced by idling has a greater effect on children than on adults. Children breathe 50% more air, have lungs that are still developing, and have narrower airways.
- **Elderly.** People's breathing ability declines as they get older, so even the healthy elderly are more likely to suffer health problems from air pollution.
- **People with lung disease, including asthma.** Those with asthma, chronic bronchitis, emphysema, and other lung diseases already have breathing problems. When they breathe ozone, they become even sicker.
- **Active adults.** People who work or exercise outdoors are exposed to air pollution from idling. Intense physical exertion or exercise increases your breathing rate and forces polluted air more deeply into your lungs.
- **Truck drivers.** While sitting in an idling vehicle, drivers are exposed to the truck's pollution more than when the vehicle is in motion, because there is no airflow to vent the emissions.

HEALTHY AIR ZONE



Help Us KEEP Our
Shenandoah Valley BEAUTIFUL

**Please Turn
Your Engine Off**

www.valleyairnow.com

valleyairnow

HEALTHY AIR ZONE



**Please Turn
Your Engine Off**

valleyairnow



AMERICAN LUNG ASSOCIATION®
of Virginia



Keep OUR Shenandoah Valley Beautiful
Reduce YOUR Engine Idling

www.valleyairnow.com

10 Simple Steps to

1. **Turn off your engine during rest periods.** Eliminating unnecessary truck idling could save up to 1,900 gallons of fuel each year. This leads to a cost savings of an estimated \$4,500, lower engine maintenance costs, fewer engine overhauls per miles traveled, and better air quality.
2. **Turn your engine off if parked for more than 30 seconds.** Generally, more than 30 seconds of idling uses more fuel than restarting the engine. Compared to driving at regular speeds, idling causes twice the wear on internal engine parts.
3. **Follow the manufacturer's recommendations.** Most engine manufacturers recommend that newer engines run for roughly 3 to 5 minutes before driving, which is much shorter than for old trucks.
4. **Consider idle-reduction technologies.** Many new technologies are available, including automatic engine shut-down systems, diesel fuel-fired heaters, auxiliary power units, and truck-stop electrification connections. For details and funding opportunities, visit www.epa.gov/smartway/idle-fund.htm.
5. **Follow idling laws and guidelines in your state.** In Virginia, the maximum idling time in commercial or residential urban areas is 10 minutes. However, trucks that use auxiliary power units are exempt.
6. **Keep your engine well tuned and maintained.** Regular maintenance and tune-ups improve gas mileage, extend the life of your truck, and improve air quality.
7. **Fill up your tank with biodiesel.** Trucks running on biodiesel smell better, produce fewer emissions, and significantly improve the lubrication of engine components. For more information on biodiesel and where to fill up, visit www.biodiesel.org.
8. **Get fuel when it's cool.** Refueling your truck during cooler periods of the day or in the evening can prevent gas fumes from heating up and creating ozone, or smog.
9. **Don't top off the tank.** This releases gas fumes into the air and cancels the benefits of the pump's anti-pollution devices.
10. **Spread the word.** If all members of the freight industry took just a few of these simple steps, it could make a big difference in the amount of fuel we consume and the quality of the air we breathe.

For more information on engine idling reduction visit
www.valleyairnow.com/cleandieselnetwork.htm

valleyairnow

Please Keep OUR Shenandoah Valley Beautiful...

Reduce Engine Idling

10 Simple Steps to Improving Air Quality in the Freight Industry

1. **Turn off your engine during rest periods.** Eliminating unnecessary truck idling could save up to 1,900 gallons of fuel each year (a cost savings of an estimated \$4,500), lower engine maintenance costs, fewer engine overhauls per miles traveled, and better air quality.
2. **Turn your engine off if parked for more than 30 seconds.** 30 seconds of idling can use more fuel than restarting the engine. Idling can cause twice the wear on internal engine parts.
3. **Follow the manufacturer's recommendation for minimum warm-up time.** Most engine manufacturers recommend that newer engines run for roughly 3 to 5 minutes before driving.
4. **Consider idle-reduction technologies.** Many new technologies are available, including automatic engine shut-down systems, diesel fuel-fired heaters, auxiliary power units, and truck-stop electrification connections. For details and funding opportunities, visit <http://www.epa.gov/smartway/idle-fund.htm>.
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Find out more:

www.valleyairnow.com/cleandieselnetwork.htm

valleyairnow

Dear Parent:

Valley AIRNow is a non-profit air quality outreach program for Winchester-Frederick County. Over the last 15 months, our area has taken many initiatives to help protect our air. We've even won some national praise for our efforts! If it is to succeed, our next initiative depends on your help.

This initiative has to do with vehicle idling—that is, running your car's engine when the car is sitting still. It might not seem like much of a problem, but you'd be surprised: vehicle idling contributes a lot to air pollution and increased health risk in our state. One of the most frequent areas for idling is at schools, when parents wait to drop off and pick up their children.

To illustrate this point, consider this—just *one* vehicle dropping off and picking up *one* child at *one* school puts about three pounds of pollution into the air per month. Furthermore, children are more susceptible to health effects of air pollution than healthy adults. So the same children being dropped off and picked up are at an increased risk of experiencing asthma and allergy symptoms.

A fact sheet is included on the back of this letter to give you more information on idling and to help illustrate why this issue is so critical.

Valley AIRNow and [insert school name] encourage you to become an active participant in protecting our air and reducing health risks by stopping idling in school zones, as well as at ATM machines, fast food places, and while running into businesses for quick stops. If you know you're going to be stopped longer than 30 seconds, please turn off your engine! It's a simple step—idling your vehicle for no more than 30 seconds will improve the air quality in our neighborhoods and the air our children breathe.

You can also protect your child's health simply by staying informed! There are daily air quality forecasts available for the Winchester-Frederick County area. These forecasts are based on the Air Quality Index and can be accessed by calling the Valley AIRNow Hotline (540.450.2207), visiting <http://www.deq.state.va.us/airquality/>, or by picking up the current edition of *The Winchester Star*.

Thank you for your support.

Valley AIRNow and [insert school name]

Idling Reduction Fact Sheet

DID YOU KNOW....?

Children are more susceptible to air pollution than healthy adults.

- Children breathe 50 percent more air per pound than adults. Also, children's lungs are still developing and they have narrower airways.
- The average American breathes 3,400 gallons of air a day.
- Each of us takes 20,000 breaths every day.

Children's asthma and allergy symptoms increase as a result of car exhaust.

- Asthma is the third leading cause of hospitalization among children under the age of 15.
- Asthma is the most common chronic illness in children and the cause of most school absences.
- On Code Yellow days of the Air Quality Index, children with asthma or other respiratory problems should limit the amount of time spent outdoors.

Idling consumes up to one gallon of fuel per hour and wastes more fuel than turning off and on your vehicle engine.

- It is more efficient to turn off most warmed-up vehicles than to idle for more than 30 seconds.
- An idling engine delivers zero miles to the gallon!
- Excessive idling can actually damage your engine's components, including cylinders, spark plugs and the exhaust system.

A single vehicle dropping off and picking up kids at one school puts three pounds of pollution into the air per month.

- An idling engine is twice as polluting as an engine in motion.
- Idling your vehicle with the air conditioner on to keep the interior cool can increase emissions by 13 percent.
- Exposure to vehicle exhaust increases the risk of death from heart and lung disease and lung cancer.

Diesel exhaust has been identified as a probable human carcinogen.

- Diesel exhaust contains microscopic soot—particles that are about 200 times smaller than the period at the end of this sentence.
- Diesel exhaust contains both very small particles and 40 chemicals that are classified as “hazardous air pollutants” under the Clean Air Act.

Air quality forecasts are available for the Winchester-Frederick County area.

- Forecasts are based on the Air Quality Index—a daily color-coded index that tells you how clean or polluted your air is, and what associated health effects might be a concern for you.
- On Code Orange days, *everyone* has a health risk! Active children and adults should limit the amount of time spent outdoors while sensitive groups, such as children with asthma, should avoid all outdoor activity and play inside instead.
- You can receive daily ozone forecasts by calling the Valley AIRNow Hotline at (540) 450-2207, visiting <http://www.deq.state.va.us/airquality/>, or by picking up the current edition of *The Winchester Star*.

Ozone and Your Health

What Is Ozone?

Ground-level ozone, a key ingredient of "smog," forms when emissions from cars, power plants, industrial boilers, refineries, gas stations, and other sources react in the presence of sunshine. On 46 occasions since 1992, the Northern Shenandoah Valley has exceeded safe ozone levels. Ozone season is from May 1- September 30.

Health Consequences

Ozone is bad for our health. Short-term exposure can cause asthma attacks, coughing, headaches, eye and throat irritation, fatigue, and breathing difficulties. Long-term exposure can permanently scar lung tissue, lower resistance to respiratory diseases, and reduce lung function up to twenty percent.

Ozone and Running

Increased ventilation rates, deeper inhalation, higher oxygen demands—all combine to make runners more vulnerable to ill effects of ozone. The more air breathed, the more pollutants come into contact with your respiratory tract. Breathing through your nose helps (nasal mucosa trap particles before they reach your lungs).

Inform Yourself

During ozone season, the Winchester-Star prints the Air Quality Index (AQI)—a color-coded index for reporting air quality and associated health risks. Use the AQI to make decisions about races and workouts.

Minimize Your Exposure

- Run in the morning, before ozone forms.
- Avoid running next to heavy traffic.
- If you must race on bad ozone days, reduce your warmup.
- Workout indoors on bad ozone days.
- Consider skipping exercise on bad ozone days.

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Do your share to preserve our air...

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Do your share to preserve our air...

Simple Steps to Improve Air Quality

Trip Chain — Combine errands into one trip. Cold starting a car pollutes up to 5 times more than when the engine's warm.

Take the Bus, RideShare/Carpool —The average driver spends about 44 cents/mile. Save the air, and your wallet.

Walk, or Ride Your Bike — Vehicles on the road create more than 25% of all air pollution nationwide. Plus, you get exercise!

Care for Your Car —Tire inflation, regular maintenance and tune-ups maintain peak gas mileage and extend your car's life. Proper car care can reduce emissions by more than half.

Refuel After Dark — Ozone forms when sunlight and heat "cooks" certain chemicals that have mixed together. Gas fumes are one of those ingredients. Refueling after dark prevents gas fumes from mixing with other ozone chemicals in sunlight.

Don't Top off the Tank —Topping releases gas fumes and cancels the benefits of the pump's anti-pollution devices.

Telecommute — Ask your employer about telecommuting, flex time, compressed work week, or staggered work hours. You and your employer can save time and money, and reduce emissions and traffic congestion.

Be Creative —There are countless ways to improve air quality.

Spread the Word — If everyone took these simple steps, we could make a big difference.

Get Informed — Learn about air quality at www.valleyairnow.com. Learn about alternate commute options at: www.vcapride.virginia.gov

If you have any questions, please contact us at 540-450-2207 or by email at info@valleyairnow.com

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10 Simple Steps To Improving Air Quality.

1. **Trip chain more often.** It's easy! Chances are, you're already doing it — combining your errands into one trip. It helps you get things done and it helps reduce traffic congestion and air pollution. When you first start a car after it has been sitting for more than an hour, it pollutes up to five times more than when the engine's warm.
2. **Take mass transit, share a ride or car pool.** Even if you do it just once or twice a week, you'll reduce traffic congestion and pollution, and save money. The average driver spends about 44 cents per mile including ownership and maintenance.
3. **Have fun! Ride your bike.** It's a great way to travel and it can help you and the air get into condition. Vehicles on the road create more than 25% of all air pollution nationwide.
4. **Take things in stride.** Walk or in-line skate instead of driving. They're easy ways to get exercise and they're easy on the air.
5. **Care for your car.** Regular maintenance and tune-ups, changing the oil and checking tire inflation can improve gas mileage, extend your car's life and increase its resale value. It can also reduce traffic congestion due to preventable breakdowns and it could reduce your car's emissions by more than half.
6. **Get fuel when it's cool.** Refueling during cooler periods of the day or in the evening can prevent gas fumes from heating up and creating ozone. And that can help reduce ozone alert days.
7. **Don't top off the tank.** It releases gas fumes into the air and cancels the benefits of the pump's anti-pollution devices. So stopping short of a full tank is safer and reduces pollution.
8. **Telecommute.** Work at home sometimes. You'll save time and money, and reduce emissions and traffic congestion.
9. **Know before you go.** If your area has a travel and transit information network, use it by calling, visiting the web site or tuning into the cable station. Get travel and transit updates before you leave home and you won't get stuck in a jam.
10. **Spread the word.** If everyone took just a few of these simple, easy steps, it could make a big difference because—

It all adds up to cleaner air



U.S. Department
of Transportation

valleyalrnow

Online Air Quality Resources **DRAFT**

General	For Educators	For Kids	Webcams, Web Videos
<i>AIRNow – U.S. EPA:</i> Air pollution data, ozone forecasting, information about public health and environmental effects of air pollution, and actions you can take to reduce air pollution. http://airnow.gov	<i>AirShare:</i> A home page for air quality communicators. Search through submitted items from across the country including news articles, reports, advertisements, brochures, photographs, and presentations. www.airshare.info	<i>Air Quality Index Kids Page:</i> Let Buster the Butterfly and the chameleons show you how EPA measures pollution in the air by playing the AQI Game Show and AQI Color Game. http://cfpub.epa.gov/airnow/index.cfm?action=aqikids_new.main	<i>EPA Air Pollution Training Institute:</i> Free, online videos on what you can do to protect yourself from polluted air. www.epa.gov/oar/oaqps/eog/broadcast.html
<i>American Heart Association:</i> Lists information on how exposure to air pollution contributes to the development of heart disease and stroke. www.americanheart.org	<i>Air Jeopardy:</i> A trivia game comprised of topics on air pollution, weather, and other air quality issues. http://daq.state.nc.us/cgi-bin/aakids.cgi?actcd=0	<i>EPA Environmental Kids Club:</i> Includes a variety of environmental topics: air, water, garbage and recycling, plants and animals, and more! www.epa.gov/kids/index.htm	<i>Digital Image Library:</i> Award-winning images of atmospheric and other phenomena available for download. www.fin.ucar.edu/ucardil
<i>American Lung Association:</i> Air quality information on outdoor pollutants, vehicle exhaust, car care, and ways to protect yourself from air pollutants. www.lungusa.org	<i>AACG Air Quality:</i> Provides air quality and transportation curriculum materials, including sample lesson plans and experiments. www.aacog.com/air/curriculum	<i>Extraordinary Road Trip:</i> A driving simulation game lets you experiment with multiple drivers, behaviors, and conditions and see the results on the air we breathe. Request your free copy. www.extraordinaryroadtrip.org	<i>National Park Service:</i> View current visibility from Washington, D.C.'s webcam overlooking the Washington Monument. www2.nature.nps.gov/air/webcams/parks/nacccam/washcam.cfm
<i>American Lung Association of Virginia:</i> Breathing dirty air? Find out with the American Lung Association State of the Air 2006 report. http://lungaction.org/reports/stateoftheair2006.html	<i>Atmospheric Visualization Collection:</i> Searchable lesson plans, links to national and state standards, as well as printable word seek games. http://education.arm.gov/nsdl/education.shtml	<i>Georgia Clean Air Campaign:</i> Visit this website for fun, interactive air quality games and puzzles; home of the Dirty Airy game. www.cleanaircampaign.com/for_schols/for_kids	<i>Penn State:</i> View ozone sensitive plants growing in filtered and unfiltered ozone chambers; viewable from April 1 st through October 31 st . www.aireffects.psu.edu/learning/webcams.htm
<i>Environmental Protection Agency – Office of Air & Radiation:</i> Information on air quality basics, indoor air, transportation fuels, acid rain, ozone depletion, visibility, and more! www.epa.gov/air	<i>DLESE (Digital Library for Earth System Education):</i> Search for air quality related information and materials by grade level, resource type, or standard. www.dlese.org/library	<i>GLOBE:</i> Worldwide network of students, teachers, and scientists working together to study and understand the global environment. www.globe.gov	<i>Traffic Land:</i> Displays live traffic and visibility video from hundreds of traffic cameras located along highways and commuting routes throughout the United States. View video from Virginia cameras in Bristol, Hampton Roads, Richmond, Shenandoah Valley, and northern Virginia. www.trafficland.com
<i>NSCEP – EPA:</i> Maintains and distributes EPA publications. Search the catalog to request your free informational materials and brochures. www.epa.gov/nscep	<i>Ozone and Your Patients' Health:</i> For asthma educators and medical professionals who counsel patients about asthma/respiratory symptoms. Patients and their families can use this material to learn the science behind ozone's effect on respiration and how to manage their respiratory health using the AQI. www.epa.gov/air/oaqps/eog/ozonehealth/index.html	<i>Kids' Crossing:</i> Fun web resource for kids containing a wealth of information on atmosphere, weather, climate, water, and much more! http://eo.ucar.edu/kids/index.html	
<i>SHENAIR – James Madison University:</i> www.isat.jmu.edu/shenair		<i>The Know Zone:</i> Print an air quality coloring book or play interactive games. www.arb.ca.gov/knowzone/kids/kids.htm	<i>Clean Air Progress:</i> Watch a video to see how we've made progress in cleaning up our air. www.cleanairprogress.org/classroom/teachers.asp

General	For Educators	For Educators	For Kids
<i>Shenandoah National Park:</i> Obtain air quality information as it relates to the Shenandoah National Park, on topics such as air pollution, acid deposition, visibility, and ozone/smog. www.nps.gov/shen/naturescience/airquality.htm	<i>Educators Bridge:</i> Teacher's guides and resources specific to elementary, middle, and high school teachers. http://eo.ucar.edu/educators/index.html	<i>Project Learn:</i> A comprehensive and educational online teaching module on Cycles of the Earth and Atmosphere designed for kids in grades 6 – 9. www.ucar.edu/learn	<i>Planet Polluto:</i> Learn about air quality index, what you can do to protect the air quality, and play games. www.planetpolluto.com
<i>U.S. Department of Energy:</i> Tips to help you reduce the amount of gas you use and a web video shows how driving style can affect MPG. www.fueleconomy.gov	<i>Environmental Education Resource Guides:</i> Download 4 free lesson plans. www.awma.org/education/freelessons.asp	<i>Smog City:</i> An interactive air pollution simulator that shows how your choices, environmental factors, and land use contribute to air pollution. www.smogcity.com	<i>Smog City:</i> An interactive air pollution simulator that shows how your choices, environmental factors, and land use contribute to air pollution. www.smogcity.com
<i>National Oceanic and Atmospheric Administration:</i> Information on current ozone conditions, meteorological tools, ozone and water vapor, greenhouse gases, and more! www.noaa.gov/airquality.html	<i>Environmental Protection Agency Teaching Center:</i> Background information on environmental concepts, environmental curriculum resources and activities, workshops and conferences. http://epa.gov/teachers/	<i>The Know Zone (California Air Resources Board):</i> Learn all about smog and try out their downloadable lesson plans. www.arb.ca.gov/knowzone/teachers/teachers.htm	<i>Santa Barbara County:</i> An interactive kiosk with games and videos designed to teach kids about air pollution, now has its games online (requires Shockwave). www.sbcapcd.org/games/gamesources.htm
<i>Foundation for Clean Air Progress:</i> View a report on air quality progress in America or find out how much cleaner the air has become in your area by clicking on Virginia. www.cleanairprogress.org	<i>GLOBE (Global Learning and Observations to Benefit the Environment):</i> Worldwide network of students, teachers, and scientists working together to study and understand the global environment. www.globe.gov	<i>AIRNow – Weathercasters:</i> By providing Air Quality Index forecasts and reports during your weathercast, you can help millions of people protect their health. http://airnow.gov/index.cfm?action=tvweather.main	<i>Creatures of Habit:</i> A short, entertaining video, in which a perky gang of computer-generated bugs offers pollution prevention tips around the yard and household. www.sparetheair.org/teachers
<i>Virginia Department of Environmental Quality:</i> View current air quality and forecasts by region. www.deq.virginia.gov/airquality	<i>In The Air:</i> Environmental education materials to educate K-12 students and adults on airborne toxics issues in their communities. Five modules available for download (K-3, 3-6, 6-8, 9-12 and adult). www.intheair.org	<i>AIRNow – Health Providers:</i> Full of information to help your patients protect their health by reducing their exposure to air pollution. http://airnow.gov/index.cfm?action=health_prof.main	<i>EEK (Environmental Education for Kids):</i> An electronic magazine for kids in grades 4 – 8 with a section entitled “The Air Around Us”. www.dnr.state.wi.us/org/caer/ce/eeek/
<i>Be Tire Smart:</i> Encourage fuel efficiency, protect the environment, and learn how to improve road safety in your region. www.betiresmart.ca	<i>It All Adds Up To Cleaner Air:</i> Download materials for your community air quality outreach program and share information with other communicators via the Information Exchange. www.italladdsup.gov	<i>AIRNow – Older Adults:</i> Information to inform older adults and their caregivers about environmental health risks and steps to reduce those risks. http://airnow.gov/index.cfm?action=static.olderadults	<i>Spare the Air Clean Air Primer:</i> Take a 3-D journey over California on a clear and polluted day or play the Clean Air Challenge Game, and learn many ways you can help clean up the air we breathe. www.sparetheair.org/teachers/primer.htm
<i>Valley AIRNow:</i> www.valleyairnow.com	<i>Project A.I.R.E.:</i> Excellent warm-up exercises, activities, and reading materials. www.epa.gov/region01/students/teacher/aire.html	<i>NSCEP – EPA:</i> Maintains and distributes EPA publications. Search the catalog to request your free informational materials and brochures. www.epa.gov/nscep	<i>Clean Air Progress:</i> Take the Clean Air Challenge and see how your or your family's actions affect air quality. www.cleanairprogress.org/classroom

Businesses helping to maintain . . .

AIRCorps

. . . clean air and blue skies

Who We Are

Valley AIRCorps is a business outreach program that creates and nurtures clean air partnerships with Winchester-Frederick County businesses, spreads the word about our air quality challenges, and provides valuable public health networking. The center of the program is membership in the Air Quality Action Day Network (AQAD)—a network to inform the public of health risks on Code Orange Action Days and to take simple steps to reduce smog-inducing emissions.

We are concerned. Clean air and blue skies are Valley hallmarks. But our way of life is threatened by pollution. On 46 occasions since 1992, Winchester-Frederick County has exceeded safe concentrations of ground level ozone. That kind of problem affects us from our health to our pocketbooks. But the good news is there are things we can do about it—and your business is in perfect position to provide recognized leadership.

Our Program

When an Air Quality Action Day (AQAD) Alert is issued, you will receive an email, fax, and/or phone call from us asking you to alert your employees and customers of the health threat, and of steps they can take to reduce the emissions we create that day.

Appoint a Clean Air Coordinator and we will help you create your own Air Quality Action Day program for your business.

Help us promote your positive steps by demonstrating that your business cares about the community and the environment.

- Encourage employee ridesharing, transit use, biking or walking to work.
- Encourage employee telecommuting, flex time, compressed work week, staggered work hours especially on Air Quality Action Days.
- Participate in our reduced idling program.
- Provide sponsorship for community incentives.
- Institute policies governing mowing, painting, refueling, and other emissions activities on Air Quality Action Days.
- Be creative! There are countless ways to cut back on emissions. Let us help you figure out what could work for you and your workforce.

We highlight outstanding programs at the end of each ozone season - businesses taking leadership initiative - we'll be praising you during a media event and on our website for doing your share to improve our air.

Become a Member

- It costs nothing to join and takes little time to manage.
- You become part of a distinguished membership of the Air Quality Action Day Network in Winchester-Frederick County.
- You demonstrate your willingness to do your share to preserve our air.
- Company program coordinators devote only 20-30 minutes per Air Quality Action Day (only 1-2 days per summer, on average) to the program, making it easy to integrate into your work schedule.

Affiliates

Affiliates are members of the AQAD alert network. The type of interaction between AIRCorps and organizations include outreach and education.

Contributors

Contributors are members of the AQAD network, participate in education and outreach programs and provide material/financial support.

Partners

Partners interact with AIRCorps at the Contributor level and participate 365 days per year through implementation of telecommuting and rideshare programs.



Shenandoah National Park is shown under poor (left) and good (right) visibility conditions. The visibility range under poor conditions is 25 km while the visibility range in under good conditions is 180 km. (Photos and data are from Shenandoah National Park.)

Valley AIRNow/AIRCorps Program
JMU-ISAT Dept • MSC 4102 • Harrisonburg, VA 22807
Phone: 540-450-2207 • Email: info@valleysairnow.com
www.valleysairnow.com



Clean air and blue skies are a Valley hallmark!
Do Your Share, Preserve Our Air

OZONE ALERT - CODE ORANGE!

This is a notice that the weather conditions TODAY are favorable for a Code Orange Air Quality Alert in the Winchester/Frederick County area.

What does this mean?

The Valley AIRNow Air Quality Outreach Program issues air quality alerts when it is predicted the region's air quality may be harmful to the public in the afternoon and early evening hours. Our primary pollutant is ground-level ozone. An Air Quality Index over 100 indicates pollution in the atmosphere is considered unhealthy for sensitive groups and merits a Code Orange Alert (see below).

What should YOU do?

1 + 1 + 1 + 1 ... = cleaner air

It takes only ONE person making ONE change in ONE last ONE car.

- For active children and adults, limit or reduce outdoor activity during the afternoon and early evening hours. Ozone can irritate your respiratory system, reduce lung function, and aggravate asthma – and ozone damage to your body can occur without obvious symptoms.
- For those with compromised respiratory systems, limit outdoor activity.
- As always, encourage such activities as carpooling and bicycling to reduce ground-level ozone. Telework from home.
- Remind everyone to refuel vehicles in the evening to limit fumes mixing with sunlight to produce harmful ozone - and don't "top off" the tank, allowing fumes to escape.
- Delay mowing with gas-powered mowers or using other heavy equipment that may emit pollution.
- Avoid drive-through windows at restaurants, banks, cleaners, etc. An idling engine can emit pollution into the air.

The Air Quality Index offers a spectrum of color-coded conditions to alert us about pollutants in the air.

GREEN	Good (0-50)
YELLOW	Moderate (51-100)
ORANGE	Unhealthy for Sensitive Groups (101-150)
RED	Unhealthy (151-200)
PURPLE	Very Unhealthy (201-300)

Valley AIRNow Air Quality Outreach for Winchester-Frederick County
For more information, or to join fellow community members in preserving our air,
please contact us at: 540.450.2207
or visit us on the web at: www.ValleyAIRNow.com



Air Quality Guide for Ozone

Air Quality	Air Quality Index	Protect Your Health
Good	0-50	No health impacts are expected when air quality is in this range.
Moderate	51-100	Unusually sensitive people should consider limiting prolonged outdoor exertion.
Unhealthy for Sensitive Groups	101-150	Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
Unhealthy	151-200	Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.
Very Unhealthy (Alert)	201-300	Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.

For more information visit EPA's web site at: www.epa.gov/airnow

Effects of Common Air Pollutants

RESPIRATORY EFFECTS



Symptoms:

- Cough
- Wheezing
- Phlegm
- Shortness of breath
- Chest tightness

Increased sickness and premature death from:

- Asthma
- Bronchitis (acute or chronic)
- Emphysema
- Pneumonia

Development of new disease

- Chronic bronchitis
- Premature aging of the lungs



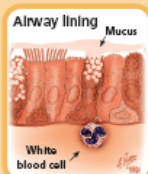
Airway Inflammation

- Influx of white blood cells
- Abnormal mucus production
- Fluid accumulation and swelling (edema)
- Death and shedding of cells that line airways

How Pollutants Cause Symptoms

Effects on Lung Function

- Narrowing of airways (bronchoconstriction)
- Decreased air flow



Increased Susceptibility to Respiratory Infection



Normal



Lung with respiratory infection

CARDIOVASCULAR EFFECTS



Symptoms:

- Chest tightness
- Chest pain (angina)
- Palpitations
- Shortness of breath
- Unusual fatigue

Increased sickness and premature death from:

- Coronary artery disease
- Abnormal heart rhythms
- Congestive heart failure

How Pollutants May Cause Symptoms

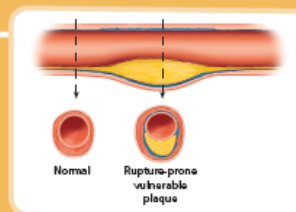


Effects on Cardiovascular Function

- Low oxygenation of red blood cells
- Abnormal heart rhythms
- Altered autonomic nervous system control of the heart

Vascular Inflammation

- Increased risk of blood clot formation
- Narrowing of vessels (vasoconstriction)
- Increased risk of atherosclerotic plaque rupture



Reduce your risk by using the Air Quality Index (AQI) to plan outdoor activities – www.airnow.gov

AQI Levels of Health Concern	AQI Values	What Action Should People Take?
Good	0-50	Enjoy Activities
Moderate	51-100	People unusually sensitive to air pollution: Plan strenuous outside activities when air quality is better
Unhealthy for Sensitive Groups	101-150	Sensitive Groups: Cut back or reschedule strenuous outside activities Particle Pollution: People with heart or lung disease (including diabetics), older adults, and children Ozone: Active children and adults and people with lung disease Sulfur Dioxide: Active children and adults with asthma Carbon Monoxide: People with heart disease and possibly fetuses and infants
Unhealthy	151-200	Everyone: Cut back or reschedule strenuous outside activities Sensitive groups: Avoid strenuous outside activities
Very Unhealthy	201-300	Everyone: Significantly cut back on outside physical activities Sensitive groups: Avoid all outside physical activities

Health outcomes are not predicted for concentrations above the design value (see table). All rights reserved.

EPA United States
Environmental Protection
Agency
EPA-402F-04-001

Appendix G

Lord Fairfax Community College 2005 – 2006
Ozone Season Survey Analysis Report



ValleyAIRNow Air Quality Outreach Program
For the Northern Shenandoah Valley Air Quality Improvement Task Force

Lord Fairfax Community College
2005-2006
Ozone Season Survey Analysis Report

Problem Statement

Valley AIRNow needed some means of trying to determine the amount of impact our educational and outreach efforts had on the Winchester-Frederick County community during ozone season 2005. To try and establish some sense of impact, we performed two random phone surveys—one at the beginning of ozone season (a pre-survey concluding in June, 2005), and the other after the conclusion of ozone season (a post-survey concluding in winter, 2005-'06).

Method

Lord Fairfax Community College agreed to put together a phone survey team, consisting of students and a coordinator. The students were paid hourly; the coordinator, a faculty member, was engaged as part of general faculty/service expectations. Using the phone book, the students randomly dialed residential numbers and asked if respondents were interested in participating in a brief survey about regional air quality. The coordinator oversaw the phoning, acted as liaison with Valley AIRNow, and compiled the data at the end of both surveys.

The pre- and post-surveys were intended to perform two basic functions: elicit information about respondents' knowledge (mostly as self-report, but with some objective means included to help establish veracity of self-reports), and to educate respondents. The pre- and post-surveys were not identical, but they sought information from the same domains of knowledge. Table 1 compares the content of pre- and post-survey questions, along with response rates.

One note about the comparability of the pre- and post-results: the response rate for the pre-tests ($n \sim 140$) was much better than for the post-tests ($n \sim 50$). Statistically, the difference makes the post-results too unreliable to taken on their own merit. However, when the results are laid out side-by-side, as is done in Table 1, it seems evident the two samples are comparable, even if statistical reliability cannot be established.

Discussion

To begin, two things should be noted. First, in the pre-survey, each question allowed for three answers: "yes," "no," or "I don't know." In the post-survey, only one question allowed for the "I don't know" option; all other questions were either "yes" or "no." Secondly, and accordingly, the "results" columns reflect the largest plurality of responses for any given question. In the pre-survey, this means, for example, that the question "is ozone an emission?" elicited response rates of 29% (yes), 49% (no), and 22% (I don't know). For this item, the largest response (49%) is the largest. Comparability would have been enhanced had each post-survey question included an

option for “I don’t know”; as it stands, however, the response rates are nevertheless remarkably similar, lending face validity at least to the comparability of results.

That said, the pre- and post-surveys reveal some interesting patterns. In the pre-survey, while people claimed to have some general knowledge about ozone and air quality, they were unwilling to claim specific knowledge (about why ozone would be classified “bad”). This was reproduced in the post-survey identifying specific ill-effects to health and plants. The survey had been designed with the assumption in mind that people tend to over-estimate their knowledge if asked generally about topics, but will not claim to have specific knowledge if presented with details. The results seem to support the assumption. On that basis, the survey gains a measure of validity: it seems to accurately measure what it was intended to measure.

One item of note relates to the final post-survey question in Table 1, which asked whether respondents have changed their driving habits as a result of learning about air quality. The total n-size for that question was only 42 respondents, making it much too small a sample to assume adequate reliability. Only 7 respondents said they had changed their driving habits, and the survey allowed no means of independently verifying the truthfulness of the self-report. Still, such an answer is valuable—it points to the hope that further outreach efforts may have a marked difference in the community’s driving habits.

Conclusions

A number of conclusions can be gleaned from the data, of which three are particularly important to Valley AIRNow’s future practices. First, our target population has a general knowledge about ozone, but lacks specificity in their knowledge. Furthermore, our target population is pleasantly open to further education about ozone, its effects on people and the environment, its causes, and its presence in Winchester-Frederick County.

Second, knowing that our target population is amenable to education is important. It means, in part, that Valley AIRNow needs to be more strategic and effective in getting our message out to people.

Third, the great majority of respondents said they get the bulk of their news from TV, yet mostly what they know about air quality comes from the newspaper. Valley AIRNow would benefit from developing a stronger presence and relationship with TV news outlets, develop some kind of informational public service campaign via TV, while concurrently improving our presence in The Winchester Star, the local newspaper.

Table 1: Comparison of Pre- and Post-Survey Questions, Types of Solicitation, and Results

Pre-Survey			Post-Survey		
Question	Type	Results	Question	Type	Results
Know what O ₃ is?	S-R ¹	A ³ : Yes, 78%	Know that O ₃ is a colorless gas in atmosphere?	S-R>O-B ²	A ³ : Yes, 92%
Heard of Air Quality Index?	S-R	A: Yes, 75%	Know that Air Quality Index is scale of air pollutants?	S-R>O-B	A: Yes, 83%
Know that there is good and bad O ₃ ?	S-R	A: Yes, 63%	Know that good O ₃ is in upper atmosphere and bad O ₃ is at ground-level?	S-R>O-B	A: No, 65%
Is O ₃ an emission?	O-B ¹	A: No, 49%	Know that O ₃ is not an emission, but a chemical reaction?	S-R>O-B	A: No, 63%
Know why it's called "bad ozone"?	S-R	AR ³ : No, 58%	Know O ₃ is bad for our health and causes crop damage?	S-R>O-B	AR ³ : No, 68%
			Major sources of news:	TV 82% Newspaper 61% Win Star: 67% Wash Post: 22% Radio 36% Top 2: WINC and Q102	
			Heard anything about air quality in Winchester-Frederick County?	S-R	A: No, 54%
				If Yes: Source? Newspaper 85% TV 15% Radio, word of mouth, and school not significant	
			Changed your driving habits as a result?	S-R	A: No, 83% A: Yes, 17%

¹ "Type" (of solicitation), S-R = self-report, and O-B = Objectively Based.

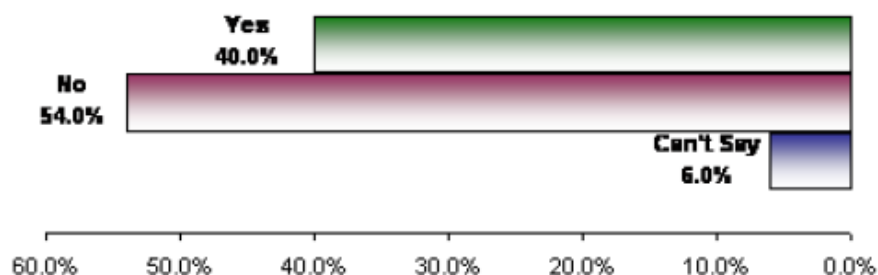
² Questions that are S-R>O-B are defined "self-report, but objectively based." While respondents might be assumed to over-estimate generally-stated knowledge (e.g., "Do you know what ozone is?"), they are assumed to be less likely to over-estimate (or falsely claim) specific factual knowledge ("Did you know ozone is a colorless gas in the atmosphere?").

³ Under "Results," A = Answer, and AR = Admission Rate (i.e., rate at which respondents admitted not knowing a question)

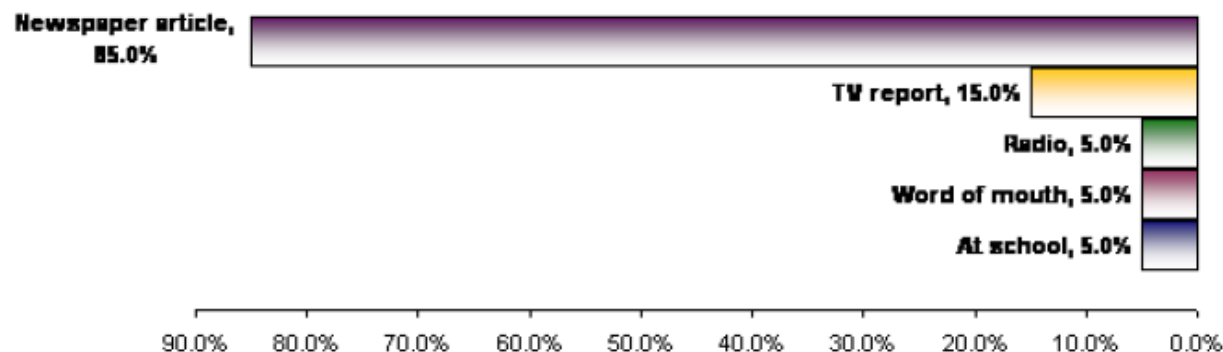
Valley AIRNow Air Quality Outreach Program WinchesterFrederick County Survey Results

Respondents	Count	Percent
Accepted	49	29.9%
Declined	115	70.1%
Total	164	

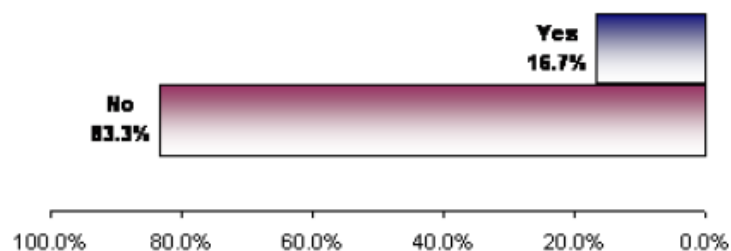
Q1. Have you heard or seen anything in the last six months about air quality in Winchester-Frederick County?



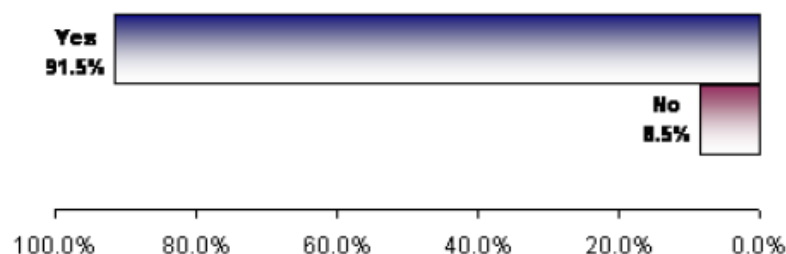
Q2. (if yes to Q1) What did you hear or see? (newspaper article, TV report, radio report, poster, presentation, other)



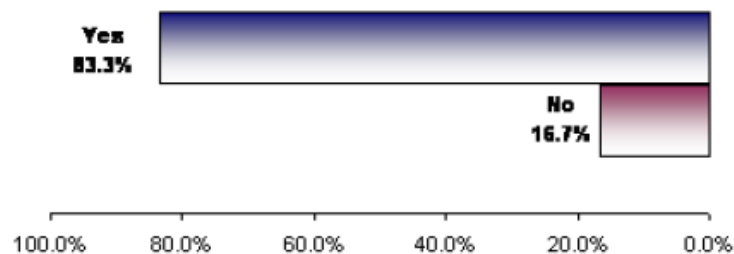
Q3. In the last six months, have you changed any of your driving habits because of what you've learned about air quality maybe started ridesharing more often, or riding your bike, or refueling after dark, or trip chaining?



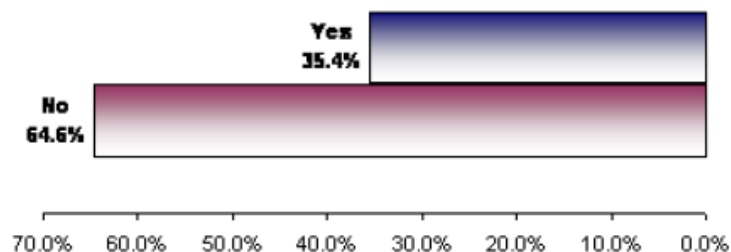
Q4. Did you know that ozone is a colorless gas that occurs in the Earth's atmosphere?



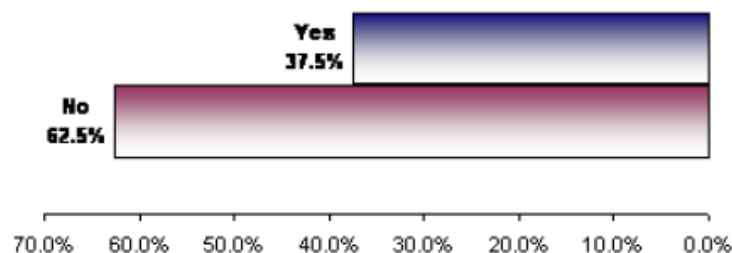
Q5. Did you know the Air Quality Index is a scale used to report levels of pollutants in the air?



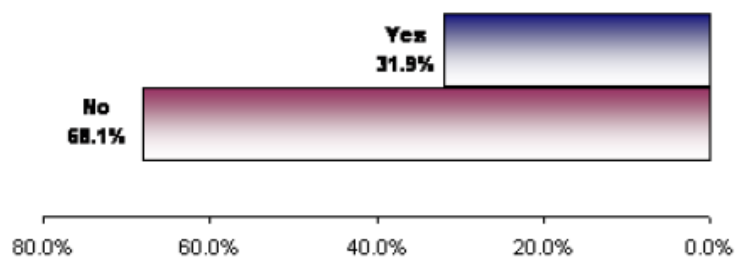
Q6. Did you know good ozone occurs 1030 miles above the Earth's surface, in the upper atmosphere, and bad ozone, also called groundlevel ozone, occurs from ground level up to 10 miles?



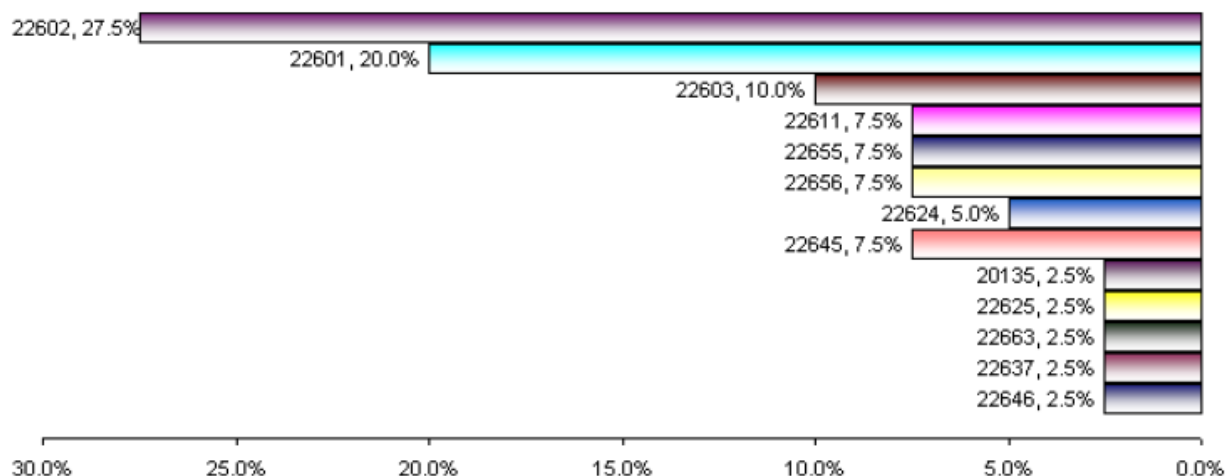
Q7. Did you know that groundlevel ozone does not come out of smokestacks or tailpipes? It forms when sunlight and warm temperatures cook chemicals from sources such as car exhaust, consumer solvents, and industry.



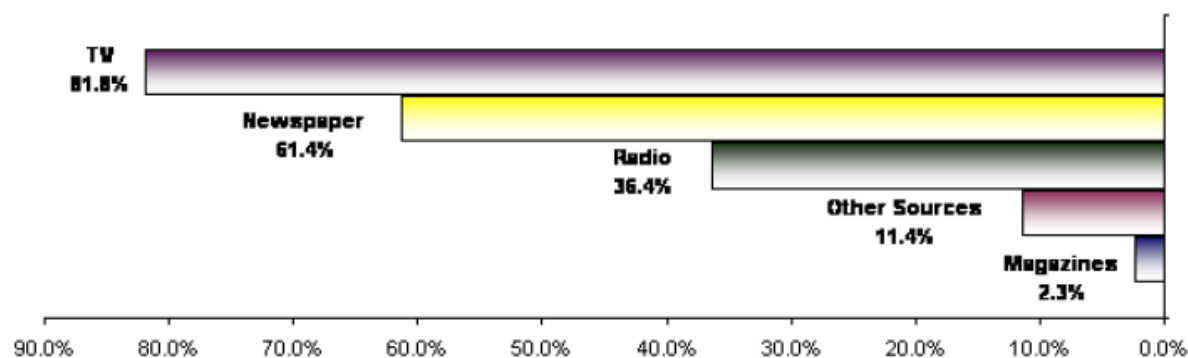
Q8. Did you know that groundlevel ozone is bad for our health? It inflames and damages cells in our lungs. Children are especially vulnerable, and plants are vulnerable, too. In the U.S., crop damage from ozone is estimated to be over \$500 million a year.



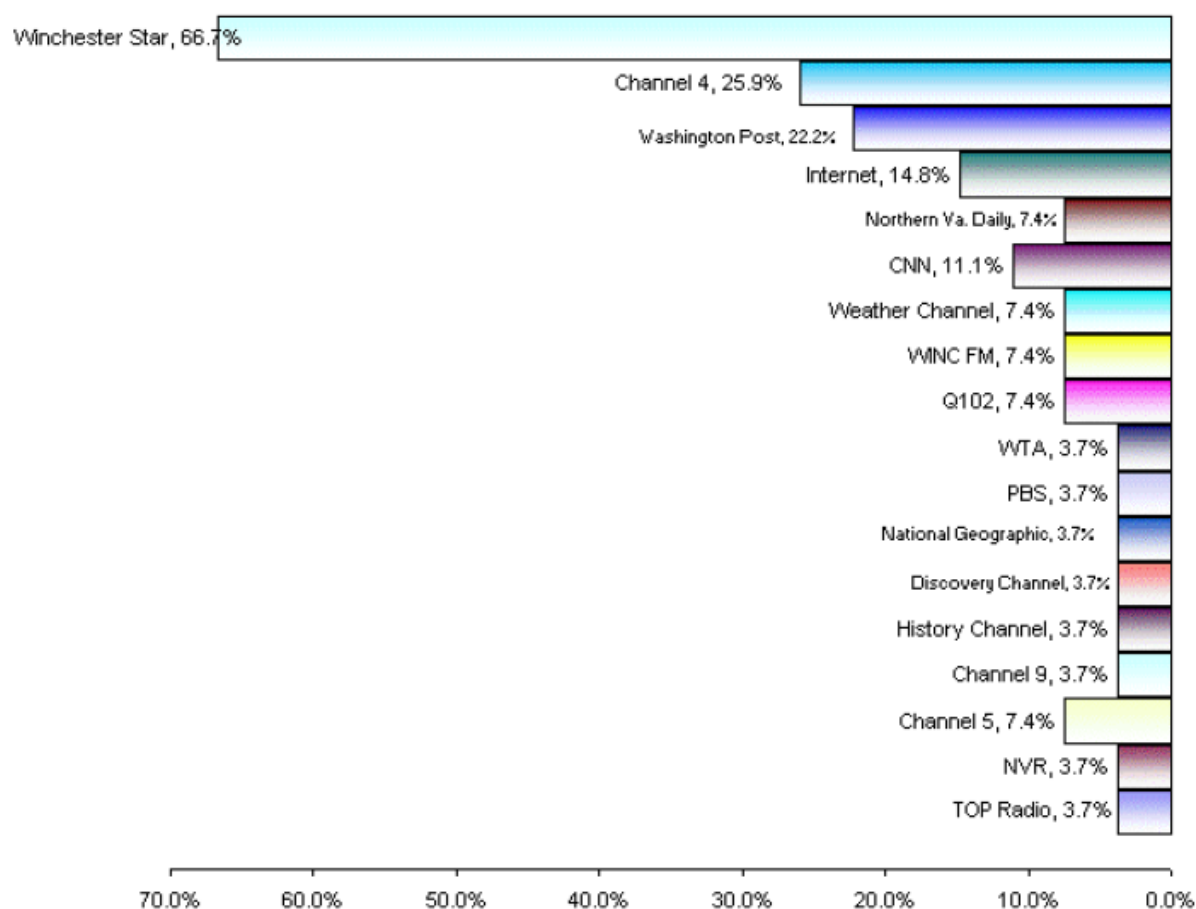
Q9. Zip codes



Q10. Top two sources where you get your news?



Q10a. Named sources



Appendix H

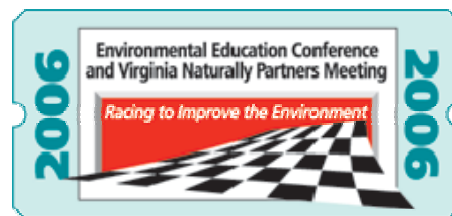
2006 Virginia Naturally Conference for Environmental
Educators

Registration Form
2006 Virginia Naturally Conference
for Environmental Educators

Racing to Improve the Environment

September 19-20, 2006

W.E. Skelton 4-H Educational Conference Center at Smith Mountain Lake



1. **BADGE INFORMATION** *(This is how your name tag will read. Please print carefully.)*

Tiffany Tumer
First name Last Name

Air Quality Outreach Coordinator
Position Title

Valley AIRNow
Organization

2. **MAILING INFORMATION** *(A confirmation letter will be sent via your email address.)*

1002 Crystal Palace Lane, Apartment #205
Mailing Address

Spotsylvania VA 22812
City State Zip

(540) 560-3466 tumerta@jmu.edu
Office Phone Fax Email

3. **EMERGENCY CONTACT INFORMATION**

Name of person to contact in case of emergency Relationship

Phone Cell Phone

4. **REGISTRATION** *[To register; please select one (1) of the following options listed below by checking ☒ the appropriate box.]*

- **Virginia Naturally Conference for Environmental Educators (Tuesday-Wednesday)**
--- ☐ (\$110)
(Registration fee, 2 lunches, breakfast, refreshments, reception, dinner, and one night lodging at double or triple occupancy)
- **Day / Commuter Rate (Tuesday and Wednesday)** -----
---- ☐ (\$90)
(Registration fee, 2 lunches, breakfast, refreshments, reception, and dinner)
- **Monday Night Lodging** -----
---- ☐ (\$45)
(Additional one night lodging including breakfast for EE Conference attendees arriving after 7 PM on 9/18/06)

5. ADDITIONAL REGISTRATION INFORMATION

- The Racing to Improve the Environment Conference registration is limited. Double Occupancy will be available to the first 110 people that register. Remaining rooms will be available at triple occupancy. Room assignments are made on a first-come, first-served basis. We suggest you register by August 11, 2006. **Registration will be CLOSED after August 25, 2006.**
- Payment must accompany the registration form. Please make checks payable to: **Skelton 4-H Conference Center** or you may pay by credit card using the authorization form that was attached to this registration form.

WORKSHOPS [To register for an interactive pre-conference workshop; please select one (1) of the following options listed below by checking ☒ the appropriate box. Pre-registration is required and space is limited.]

** Note: MWEE (Meaningful Watershed Educational Experience) Pre-Conference workshop will be sponsored by NOAA. Space is limited and will be open to the first 50 educators affiliated with MWEE projects that return their registration forms and pay the conference registration fee. There is no charge for the workshop but workshop attendees must register and pay the registration fee for the EE conference. The MWEE workshop will include lunch, dinner, breakfast, refreshments and one night lodging at double or triple occupancy on Monday, Sept. 18th.*

- Introduction to MWEE – Meaningful Watershed Educational Experiences-----○
September 18, 2006
Noon – 5:00 p.m.
Sponsored by NOAA for educators involved with MWEE projects
* Limit: 50 participants
- Lost Art of Classical Field Investigations -----○
September 19, 2006
10:00 a.m. – Noon
Limit: 20 participants
- Got Behavior, Got Change/ Social Marketing -----○
September 19, 2006
10:00 a.m. - Noon
- VA State Parks- Your Backyard Classroom: Mountain Edition-----○
September 19, 2006
10:00 a.m. – Noon
- Experiencing Nature with CBF's Bill Portlock and Cindy Duncan-----○
September 19, 2006
10:00 a.m. - Noon
Limit: 20 participants
- Probeware for the Faint at Heart and Project TILDA-----○
September 19, 2006
10:00 a.m. - Noon
Limit: 20 participants

6. LODGING

Please check ☒ all nights for which you will need lodging.

☐ Monday, September 18 ☐ Tuesday, September 19 ☐ No Lodging Needed

Lodging will be assigned in the order that registration forms are received. Participants will be lodged two (2) or three (3) per room. Bed linens, pillow and towels will be provided.

Please place me with another: ☐ MALE ☐ FEMALE

List Roommate Preference(s): _____

7. SPECIAL HEALTH, PHYSICAL, SENSORY, OR DIETARY NEEDS:

Please include if you will need wheelchair accessibility

n/a

PAYMENT (from #4 above)

(A) Registration Fee = 110.00

(B) Additional Lodging = 0.00

(C) TOTAL ENCLOSE

110.00

CANCELLATION POLICY

All registrations are considered payable at the time of registration. Cancellations will be refunded, less a \$10.00 processing fee, if received before August 25, 2006. Cancellation received after August 25 will no receive a refund, but a substitute attendee will be permitted.

QUESTIONS

Questions regarding lodging, special needs, etc. should be directed to Amanda Archer at aarcher@vt.edu or (540) 721-2759 [Ext. 262].

Questions regarding the conference should be directed to Nancy Drumheller at nwdrumheller@deq.virginia.gov or (804) 698-4550.

SUBMITTING YOUR REGISTRATION

Using email (preferred), fax, or regular mail, please submit your completed registration form no later than **August 25, 2006** to:

Amanda Archer, Conferencing Manager
W.E. Skelton 4-H Educational Conference Center at Smith Mountain Lake
775 Hermitage Road, Wirtz, VA 24184
aarcher@vt.edu
PH: (540) 721-2759 ♦ FAX: (540) 721-2766



W.E. Skelton 4-H Educational Conference Center
Credit Card Authorization Form

Event Name: 2006 Virginia Naturally Conference for Environmental Educators

Event: Dates September 18-19, 2006

Amount Due: _____

I hereby agree that all specified charges incurred from the above event will be charged to my credit card.

Type of Card _____
Visa or MasterCard

Expiration _____
Date

Credit Card Number: _____
Include the 3-digit Card Verification
Number on back of card

Name on Card: _____

Billing Address: _____

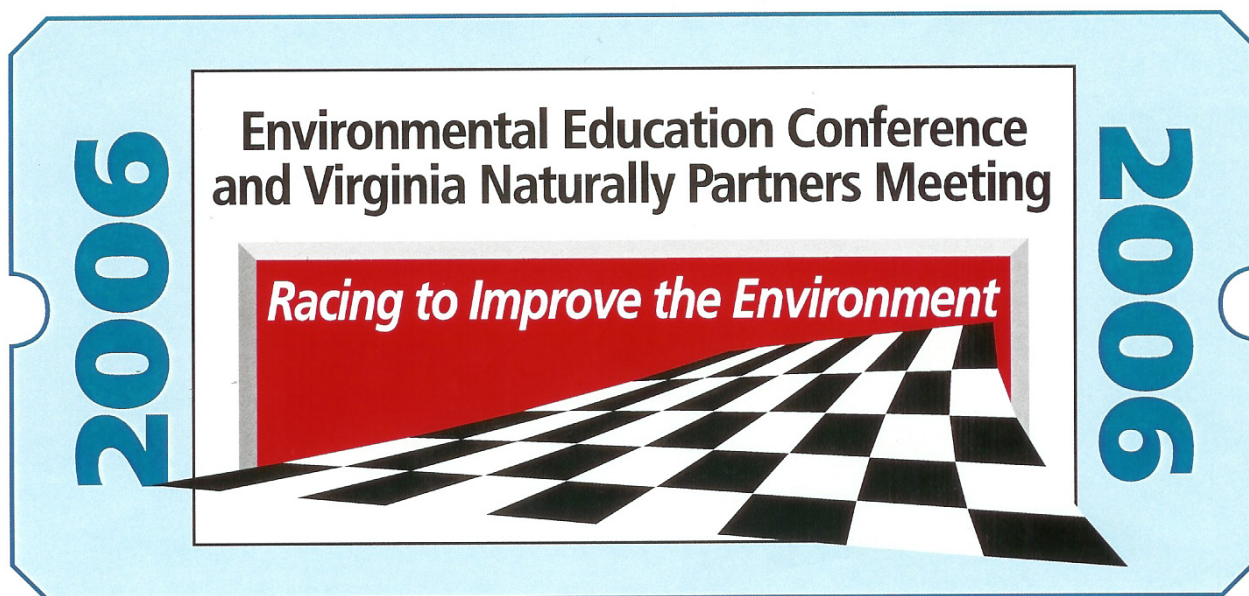
Signature Date

Printed Name Daytime Telephone Number

For Office Use Only:

Processed by: _____

Process date: _____



W.E. SKELTON 4-H EDUCATION
CONFERENCE CENTER
SMITH MOUNTAIN LAKE

SEPTEMBER 19 - 20, 2006

TUESDAY, SEPTEMBER 19, 2006

9:00 a.m.	Registration and Exhibits Open <i>Smith Central Activities Building</i>
10:00 a.m.	Grant and Fundraising Resources <i>RJJ- upper level- Classroom A</i> Jill Bieri, NOAA BWET; Ann Regn, DEQ/VOEE Grant making priorities and tips for successful applications and reporting.
10:00 a.m.	Concurrent Sessions (Pre-registration required)
	A. Lost Art of Classical Field Investigations <i>Meet at front entrance to Smith Central Activities Building</i> Mike Hayslett, Naturalist Participants will learn or relearn basic field investigation skills while hiking the beautiful and natural setting of the 4-H Center. Dress appropriately for an outdoor hike on Shoreline Nature Trail. Bring your binoculars and cameras.
	B. Got Behavior Change? Going Beyond What People Know to What People Do <i>Taubman Conference Room</i> Staci Martin, First Landing State Park; Dr. Bill Leavitt, ODU; Terry Hargrove, American Lung Association; Kristin O'Connell, Wildlife Center of Virginia Panel presentation and discussion on how behavior change can be effectively addressed to foster stewardship. Join others for an interactive "Marketing Plan Starter" competition using the elements of social marketing. The most creative team will win a prize!
	C. Virginia State Parks - "Your Backyard Classroom": Mountain Edition <i>RJJ- Lower Level- Classroom D & E</i> Beth Hawse and Ellen Reynolds, Douthat State Park Workshop features the YBC Mountain Edition curriculum guide designed for those interested in environmental education. YBC trains educators to use hands-on, K-12 correlated and SOL-based activities with students in classrooms or at Virginia State Parks.
	D. Experiencing Nature Canoe Style <i>Meet at dock</i> Bill Portlock and Cindy Duncan, CBF Participants can enjoy canoe paddling and nature reflection on Smith Mountain Lake.
	E. Probeware for the Faint at Heart and Project TILDA <i>Meador Nature Education Center</i> Barry Fox, VSU; Peter Walker; Anne I. Pierce, Hampton University Experts will show participants how data driven decision-making about the environment and technology integration strategies are used to create student-centered projects in a standards-centered world. Participants will get an introduction to the digital data world, how to use the equipment and get the software to work. We'll measure temperature and conductivity, download to a laptop, and analyze the data. It's no more challenging than using the TV remote.
Noon	Lunch <i>Smith Central Activities Building/Dining Hall</i> Welcome Steve Dietrich, DEQ, WCRO; Ann Regn; Suzie Gilley, VRUEC

1:00 p.m.	Keynote Address Ward Burton Racing to Improve the Environment
2:00 p.m.	Concurrent Sessions A. Attracting Native Birds <i>JoCo Learning Center- Large Classroom</i> Steve Yob, Henrico County Solid Waste Division; Suzie Gilley, DGIF Learn how to invite native birds to your backyard or outdoor habitat/learning center along with maintenance tips. Participants will build their own birdhouse. Everything provided. Limited to 15 participants. B. Watershed and Soils Education (Part 1 and 2) <i>RJJ- Lower Level- Classrooms D & E</i> Dana Roberts, VAASWCD; Joyce Buchanan, Tazewell SWCD Part 1: During this interactive session you will learn how to teach water, soil, and pollution topics to any audience. See demonstrations/skits on how to transition your classroom and students into a functional stream; conduct a cooking demonstration where the main course is teaching students about pollution in their community; and play Conservation Jeopardy. Part 2: Learn about how to teach your students about soils, earthworms and the environment. Interactive demonstrations on soil programs. C. Master Naturalists and Monarch Butterflies: Become A Citizen Scientist <i>RJJ Upper Level- Classroom A</i> Michelle Prysby, Virginia Master Naturalist Program Through hands-on field activities, explore ways teachers, students, and other citizens can help scientists learn more about monarch butterfly biology. Learn how you can do more citizen science projects through the new Virginia Master Naturalist program. D. K-12 and Connecting Environmental Education to SOLs <i>RJJ – Upper Level- Classroom B</i> Paula Klonowski, DOE; Chuck Pace, Albemarle County Schools See how environmental education is woven into the K-12 science SOLs and learn ways to better connect with schools. The second part of the session will focus on how community partners can connect K-12 schools to involve students in EE projects in the classroom. E. Seeing the Forest through the Trees: Successful Outdoor Learning in the Forest Succession Study Site <i>Meador Nature Education Center</i> Judy Strang, Robert E. Lee SWCD and Pedlar River Institute Adopting trees, studying spittle bugs, and conducting mini-watershed experiments are some of the hands-on SOL correlated activities for K-5 students to be showcased during this presentation. Judy Strang will share her experience directing the Forest Study Site education program at Pleasant View Elementary School, offering ways and reasons to get teachers and students involved in outdoor learning.
3:30 p.m.	Networking Pit Stop
4:00 p.m.	Concurrent Sessions A. Archaeology as an EE Tool <i>RJJ- Upper Level, Classroom A</i> Dee DeRoche, DHR

Excavations often shed light on the natural resources in the past. How did Virginia's earliest people use and change their surroundings? Learn about reconstructing previous environments and interpreting ancient life ways with archaeological evidence. Encourage participatory learning by trying early technologies for making tools and preparing food.

B. Watersheds and 4th Graders: Make the Connections

JoCo Learning Center- Large Classroom

Ed Davis, Emory and Henry College

Using a mussel costume and basic knowledge, a volunteer can get fourth-graders excited about their watersheds. Students are able to imagine mussels as fellow creatures, and to understand freshwater ecosystems. They engage better with a human than with a video, and are encouraged to ask the mussel character questions.

C. Self Guided Backpacks for your Interpretive Site

RJJ- Upper Level- Classroom B

Candace Felling and Lisa Green, State Arboretum of Virginia at Blandy Experimental Farm

Learn how backpacks full of self-guided activities can be offered to visitors and teachers as a way to focus and direct their nature experiences. Themed backpacks can offer teachers and students an opportunity to explore the outdoors on their own. Brainstorm ideas for your own site!

D. Using Project WILD: Science and Civics for MWEE

RJJ- Lower Level- Classrooms D & E

Suzie Gilley, DGIF

Project WILD's newest curriculum guide, *Science and Civics*, will provide background and activities to help students have a meaningful outdoor experience.

E. Disappearing Wetlands

Meador Nature Education Center

Trish Lawson and Kay Hamner, JASON Project

Wetlands are unique ecosystems found throughout the world that provide habitat for an incredible diversity of plants and animals. Join us to understand what wetlands are, why they are disappearing, and how to best manage these ecosystems in Louisiana, in your neighborhood and around the world.

5:30 p.m.

Tim Grant, Editor, Green Teacher Magazine
Smith Central Activities Building/Dining Hall

Evening Reception and Exhibits

6:30 p.m.

Dinner
Smith Central Activities Building/Dining Hall

7:00 p.m.

PLT for Pre-Service Educators
JoCo Learning Center, Classrooms/Computer Lab
Lisa Deaton, DOF

(Private Session for PLT Facilitators at Colleges & Universities)

8:00 p.m.

Networking Around the Campfire
Bring your own musical instrument and enjoy s'mores at the Campfire Circle

WEDNESDAY, SEPTEMBER 20, 2006

7:00 a.m.

Interpretive Bird/Natural History Walk with Bill Portlock
Meet at Willard Pavilion.
 Bring your own binoculars and cameras.

7:30 a.m.

Breakfast Buffet
Smith Central Activities Building/Dining Hall

8:15 a.m.

Concurrent Sessions

- A. James A. Meador Nature Center: The "Green" Building**
 Meador Nature Education Center
 Becca Obert, Skelton 4-H Outdoor Education Program

Sustainability is the buzz word for environmentally-friendly behaviors, so get on board the bus (biodiesel of course) to become more "green". The James A. Meador Nature Center is a completely green building - from lighting, heat and building materials. A tour of the building, how the building is used as a teaching tool and how to make your program more "green" will all be included.

- B. Environmental Education Certification Program for Non-formal Educators: A closer look at a new program for Virginia's Soil and Water Conservation Districts**
RJJ- Upper Level- Classroom A
 Lane Guilliams, DCR; Dana Roberts, VAASWCD

Environmental educators come from a variety of backgrounds and experiences. Environmental Education (EE) certification training programs offer recognition and growth along with providing uniform and foundational information on the many aspects of EE. Come and learn about a voluntary training course based EE certification program being offered to its educational staff by Virginia's Association of Soil & Water Conservation Districts.

- C. Bats and Cave Critters**
RJJ Lower Classroom F
 Carol Zokaites, DCR

Virginia's new state bat lives in caves. Learn about the Virginia Big-eared bat and cave biodiversity. Receive materials and activities about these animals.

- D. Got Message: Let Everyone Know**
Taubman Conference Room
 Rex Springston, Richmond Times Dispatch; Sandy Greene, SWCD; Chuck Epes, CBF; Robin Dunbar, The Elizabeth River Project

"...numbers numb, jargon jars, and nobody ever marched on Washington because of a pie chart." When it comes to capturing attention and galvanizing the public to action, stories mean more to people than numbers. Getting those stories out into the media is another valuable skill. This session will highlight how one or more environmental organizations have educated the public and promoted their programs in the newspaper and other media. Tips and techniques in telling stories and getting the attention of the media will be highlighted.

- E. Learning Landscapes and Outdoor Classrooms**
RJJ- Lower Level Classrooms D & E
 Deni Peterson, Appalachian Sustainable Development; Ellen Reynolds, Beagle Ridge EE Center

Through Learning Landscapes and outdoor classrooms programs children learn to love nature while they study science. See how hands-on exploratory experiences bring science alive,

and apply to a range of learning styles. The hands-on lessons reinforce (VA SOL's) indoor science lessons and readings. Come learn how to start your own outdoor learning environment and see firsthand how these programs help foster children's sense of stewardship and pride toward their own neighborhoods and schoolyards.

10:00 a.m.

Concurrent Sessions

A. Got Partners? The Power of Many

Taubman Conference Room

Catherine Short, 4-H; Charlene Talcott, York River State Park; Julia Hillegass, HRPDC; Robin Dunbar, HRAEE; Sandy Green, HSWCD Facilitators: Ellen Powell, DOF; Angela Neilan, DEQ

This panel and interactive discussion will cover several aspects of effective partnerships:

Creating New Opportunities

How do you find new partners? What can you do to attract partners to seek out your organization? What makes good partners? When do you say "no"? Find out some "insider secrets" to building or enhancing your partnership programs.

Partnering for Increased Resources

In this era of cutbacks, you are being asked to do more with less. There is a solution. Partner with others and share the bill! Learn how partnering organizations form win-win alliances by sharing resources and credit.

Synergistic Communications

Environmental issues are complex and target audiences vast and varied. Discuss ways to spread messages across audiences and regional boundaries for effective behavior change.

B. Wet & Wild Chesapeake Bay

Meador Nature Education Center

Shirley Spyolt, Cooper Magnet Elementary School

Hear how elementary students spend two weeks exploring the Chesapeake Bay: adopting trees; visiting salt marshes, peat bogs, and submerged pine forests; camping on the Eastern Shore; looking for macro-invertebrates in leaf litter; and collecting marine organisms for a mini-zoo. Go outdoors to explore watersheds as conference center parking lot storm drains are located and mapped.

C. Service Learning

RJJ Upper Level - Classroom A

Jennifer McDonnell, Capital Earth Force; Marilyn Elder, DOE

This session will discuss projects that establish, expand or implement environmental service learning and will include grant opportunities, resources and tips on forming partnerships with schools.

D. Project Learning Tree: Places We Live Module

RJJ Lower Level - Classroom D & E

Lisa Deaton, DOF

Students discover their own backyards and work as community detectives to discover the environmental, social, and economic integrity of the places we live. Activities explore sense of place, community character, changes in land use over time, ecological footprints, and more. All participants will receive a free copy of the Places module and SOL correlation.

E. The 3 R's: Reading, Restoration and Reflections of Rivers

RJJ Upper Level- Classroom B

Tamra Willis, Mary Baldwin; Betty Gatewood, Augusta County Public Schools/Mary Baldwin College MAT; Sandy Burk, Author

Hear about two unique stories that integrate the river environment with learning. Marv

Baldwin's "Reading on the River" includes a graduate course on using the environment to improve literacy, especially reading and writing in the content areas. Participating teachers experience the process themselves through journaling and field visits to develop an environment-based literacy program for their schools. Author Sandy Burk weaves science and restoration into a story of hope and renewal for the Potomac's shad. Participants will review one school's success story as featured in the new award winning book *Let the River Run Silver Again!* and in the NSTA Science and Children article "A Shad Story"

F. Road Trip to Clean Air

JoCo Learning Center- Large Classroom

Dr. C.J. Broderick and Tiffany Turner, ShenAir and James Madison University

This workshop will provide a brief introduction to the science surrounding air quality, air pollution impacts on human health and natural resources in Virginia, and individual actions that can make a difference in improving the quality of our air. Interactive stations will be available to demonstrate learning activities for K-12 classrooms, including: video games and software, a vehicle simulator, and scientific equipment to measure the amount of smog in the air.

Noon

Lunch

Smith Central Activities Building/Dining Hall

12:45 p.m.

General Address

Smith Central Activities Building

Kathy Frahm, DEQ

Virginia's Environmental Issues and the Kaine Administration Priorities

The Honorable L. Preston Bryant, Jr., Virginia Secretary of Natural Resources

1:30 p.m.

Interactive Breakout Sessions

Smith Central Activities Building

Each session will begin with a brief overview of the topic's trends and issues, including some facts and supporting data. Small group discussions will follow where participants will be able to ask questions and offer their ideas on educating the public. Beefy resources will be provided to take away.

A. Water Supply

Scott Kudlas, Adrienne Averitt and Tammy Stephenson, DEQ

Clean, reliable drinking water and safe wastewater systems are essential to the health of our families. In rural localities, it is equally important to economic development. What are we doing to ensure adequate supplies?

B. Water Quality

Amanda Gray, Kelly Wills, DEQ

Great strides have been made in cleaning up Virginia's rivers and Bay so do I need to be concerned about Impaired waters, TMDLs, Tier III and Fish Advisories?

C. Biodiversity

David Whitehurst, DGIF

A term coined by Dr. Tom Lovejoy in the 80s but do global concerns have a place here in Virginia?

D. Fisheries

Barry Fox, Virginia State University; Bud LaRoche, DGIF

Current research is revealing serious impacts on living resources in aquatic environments due to a number of causes.

- E. **Energy**
Mary Spruill, NEED
- Fuel is consumed and energy is transformed everywhere on Earth. The relationship between energy, economics, and pollution - both direct and indirect is vital to understand.
- F. **Land Preservation**
Russ Baxter, DCR; Anna Wills, Virginia Explore Park
- Every day land is scarcer and more expensive. Discuss how the Kaine Administration will meet its open space goals.
- G. **Air Quality**
Terry Hargrove, American Lung Association
- More than half of Virginians live in areas prone to bad air quality. How can we reduce air pollution and improve air quality?
- H. **Mercury**
Mark Richards, DEQ
- A highly toxic metal, mercury can cause human health problems, including those affecting the brain and nervous system, such as slow speech and memory loss. What are the local sources and effects in Virginia?

2:45 p.m. Door Prize Drawings

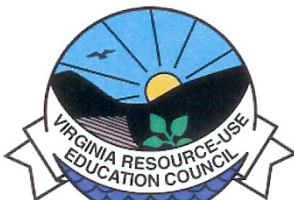
3:00 p.m. Conference ends

Exhibits will be displayed in the Smith Central Activities Building until Wednesday, 11:00 am. Door prizes and an array of exceptional educational materials will be distributed during the last session on Wednesday afternoon.

This conference is sponsored by the Virginia Office of Environmental Education at DEQ and the Virginia Resources-Use Education Council with support from the Virginia Coastal Zone Management Program and NOAA Chesapeake Bay Office.

Thank you to Graves Mountain, Forbes Candies, and EPA - Office of Environmental Education for their donations to the conference. Also, a special thanks to the outdoor education staff with the 4-H center for spearheading a waste management conference.

Compostable products used at this conference were obtained by World Centric at www.worldcentric.org.



Appendix I

National Alternative Fuel Vehicle Day Odyssey
James Madison University

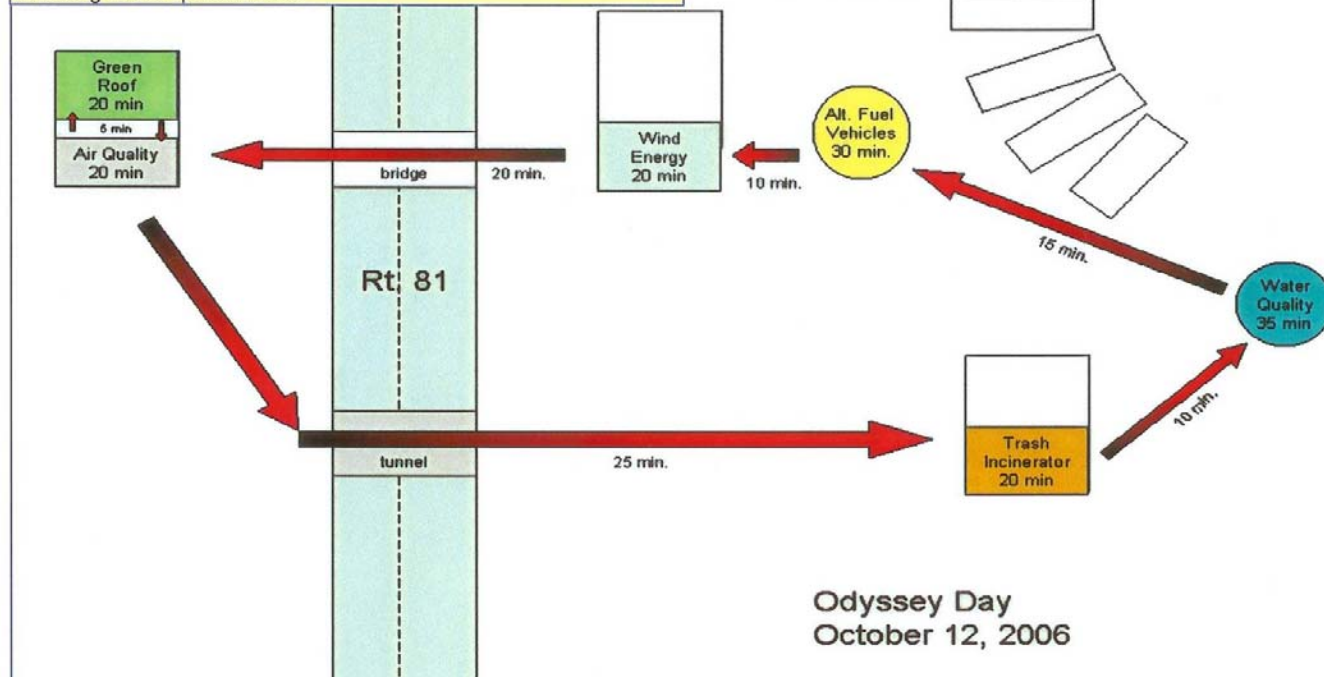
2006 Odyssey Day - James Madison University - Schedule of Events

	Grace Christian - Staunton, V A Cindy Grant Grades 5 and 6 YELLOW GROUP 56 Students / 5 chaperones	Fort Defiance, Augusta and Turner Ashby, Rockingham Michael Jaycox and Julie Maxwell Grades 10 and 12 BLUE GROUP 36 students and 4 chaperones	Millbrook and Sherando HS, Frederick Mark Hawkins and Brian Fisher Grades 11 and 12 BROWN GROUP 40 students and 4 chaperones	Elkton MS, Rockingham Kirsten Hurme Grade 8 GREEN A 40 students and 4 chaperones	Elkton MS, Rockingham Kirsten Hurme Grade 8 GREEN B 40 students and 4 chaperones
8:45	Arrival/Registration escorted to starting location	Arrival/Registration escorted to starting location	Arrival/Registration escorted to starting location	Arrival/Registration escorted to starting location	Arrival/Registration escorted to starting location
9:00					
9:15	9:15 AFV Presentation Begins 35 minute presentation	9:15 Wind Energy Presentation Begins 25 minute presentation	9:15 Green Roof / Air Quality Presentations begin 20 minute presentations	9:15 Incinerator tour begins 30 minute presentation	9:15 Water Quality Presentation 35 minute presentation
9:30			9:35 Air/Roof groups switch locations 9:40 Air Quality/Green Roof Presentations begin 20 minute presentations		
9:45	9:50 begin walking to ISAT (10 minutes for travel time)	9:40 begin walking to Air/Roof (20 minutes for travel time) split into two groups along the way		9:45 Start Walking to Water Quality (10 minutes allowed for travel time)	9:50 Start Walking to AFV (15 minutes allowed for travel time)
10:00	10:00 Wind Presentation Begins 25 minute presentation	10:00 Green Roof / Air Quality Presentations begin 20 minute presentations	10:00 Start walking to Incinerator (25 minutes allowed for travel time)	9:55 Water Quality Presentation 35 minute presentation	10:05 AFV Presentation begins 30 minute presentation
10:15		10:20 Air/Roof groups switch locations			
10:30	10:25 begin walking to Air/Roof (20 minutes for travel time) split into two groups along the way	10:25 Air Quality/Green Roof Presentations begin 20 minute presentations	10:25 Incinerator tour begins 20 minute presentation	10:30 Start Walking to AFV (15 minutes allowed for travel time)	10:35 Start Walking to ISAT building (10 minutes allowed for travel time)
10:45	10:45 Green Roof / Air Quality Presentations begin 20 minute presentations	10:45 Start walking to Incinerator (25 minutes allowed for travel time)	10:45 Start Walking to Water Quality (10 minutes allowed for travel time)	10:45 AFV Presentation begins 35 minute presentation	10:45 Wind Presentation Begins 25 minute presentation
11:00	11:05 Air/Roof groups switch locations 11:10 Air Quality/Green Roof Presentations begin 20 minute presentations		10:55 Water Quality Presentation 35 minute presentation		
11:15		11:10 Incinerator tour begins 20 minute presentation		11:20 Start Walking to ISAT building (10 minutes allowed for travel time)	11:10 begin walking to Air/Roof (20 minutes for travel time) split into two groups along the way
11:30	11:30 Start walking to Incinerator (25 minutes allowed for travel time)	11:30 Start Walking to Water Quality (10 minutes allowed for travel time)	11:30 Start Walking to AFV 15 minute travel time	11:30 Wind Presentation Begins 25 minute presentation	11:30 Green Roof / Air Quality Presentations begin 20 minute presentations
11:45		11:40 Water Quality Presentation 35 minute presentation	11:45 AFV Presentation begins 30 minute presentation		11:50 Air/Roof groups switch locations
12:00	11:55 Incinerator tour begins 20 minute presentation			11:55 begin walking to Air/Roof (20 minutes for travel time) split into two groups along the way	11:55 Air Quality/Green Roof Presentations begin 20 minute presentations
12:15	12:15 Start Walking to Water Quality (10 minutes allowed for travel time)	12:15 Start Walking to AFV (15 minutes allowed for travel time)	12:15 Start Walking to ISAT building (10 minutes allowed for travel time)	12:15 Green Roof / Air Quality Presentations begin 20 minute presentations	12:15 start walking to incinerator (25 minutes allowed for travel time)
12:30	12:25 Water Quality Presentation 35 minute presentation	12:30 AFV begins 30 minute presentation	12:25 Wind Presentation Begins 25 minute presentation	12:35 Air/Roof groups switch locations 12:40 Air Quality/Green Roof Presentations begin 20 minute presentations	12:40 Incinerator tour begins 20 minute presentation
12:45					
1:00	FND	FND	FND	END	END

MAP for Odyssey Day 2006.

Presentation Times are given for each station, along with travel times for schools to move from one station to the next.

Exact schedules for schools AND stations are provided on the following Excel spreadsheets



Appendix J

2007 National Air Quality Conference

**2007 National Air Quality Conferences:
Air Quality Forecasting, Mapping, and Monitoring
and
Communicating Air Quality and Communities in Motion**

February 11-14, 2007
Royal Plaza Hotel, Orlando, Florida

Speaker and Poster Proposal Submittal Form
*****Deadline for Submission: November 10, 2006*****
Please send this form to NAQCabstracts@epa.gov

Title: Assessment of air quality outreach effectiveness in rural schools: pilot test results from the Shenandoah Valley, Virginia's Valley AIRNow study.

Author(s): Dr. Christie-Joy Brodrick & Tiffany Tumer

Organization: Valley AIRNow

Address: James Madison University, ISAT/CS Building, MSC 4102, Harrisonburg VA 22807

Phone: (540) 560-3466 Fax: (540) 898-4226

E-mail Address: tumerta@jmu.edu

Type of Submittal: Presentation _____ Poster X Student Poster _____

Conference Topic:

Air Quality Forecasting, Mapping, and Monitoring:

- _____ Air Quality Forecasting Case Studies and Field Experiments
- _____ Impact of PM 2.5 AQI Changes on Forecasting
- _____ Developing and Using Webcams as Part of Air Quality Forecasting, Monitoring, and Outreach Programs
- _____ Meteorological Monitoring and Related Quality Assurance
- _____ Ambient Monitoring Related to Air Quality Forecasting and Reporting
- _____ Advancements in Mapping Air Quality Concentrations
- _____ Future of Air Quality Forecasting: The Impacts of Lower Emissions, Changing Climate, and New Sources of Pollution
- _____ Air Quality Forecast Model Development
- _____ Smoke Management

Communicating Air Quality and Communities in Motion:

- _____ Agricultural Issues (Optional Sunday Morning Session)
- _____ Air Quality and Health
- _____ Innovative State and Local Initiatives
- _____ Something for Nothing
- _____ Greenhouse Gases and Global Climate Change
- _____ Building Partnerships with Nontraditional Stakeholders
- X Measuring and Evaluating Educational Outreach

Abstract (500 words or less):

A survey of 39 air quality outreach programs across the United States revealed that a majority of programs rely primarily on the completion of short-term milestones as indicators of the effectiveness of that outreach. Quantitative assessment of the effectiveness of outreach, particularly as it relates to grades K-12, was not reported in any of the surveys. Although qualitative measurements are valuable evaluation tools (for example, in improving our outreach programs), qualitative measures alone seldom provide a comprehensive representation of program success, such as that needed to select which programs to pursue or to secure external funding. Valley AIRNow, an outreach program in rural Virginia, piloted a method that both qualitatively and quantitatively assessed the effectiveness of our K-12 outreach program. The qualitative module consists of a post-program survey measuring the educational value of outreach activities and individual behavior change that has occurred as a result of the program. The quantitative module incorporates a modified version of "A Method to Measure Travel and Emissions Impacts of Ozone Action Public Education Programs," which was developed in 2003 under contract for EPA and FHWA. This paper describes the assessment process, including the development of cost-effectiveness estimates that allowed us to compare the outcomes of our education programs with those of our other air quality mitigation programs -- ridesharing and vehicle idle reduction. We discuss the value of these results in justifying future K-12 education expenditures to our board of directors, to potential funding sources, and to stakeholders.

Presenters:

-Please list the author(s) expected to be presenting at the conference: Tiffany Tumer

-Include a biography for each presenter (200 words or less).

Tiffany Tumer is the Air Quality Outreach Coordinator for Valley AIRNow—a non-profit, public outreach organization representing the Early Action Compact area of Winchester-Frederick County, Virginia. She holds a Masters in Integrated Science and Technology from James Madison University, which she received in May of 2006. In 2003, she received her BA cum laude in Biology from Bridgewater College, Virginia.

Appendix K

3rd Annual Opportunity Winchester Street Festival

Opportunity Winchester's STREET FESTIVAL

& Winchester's All-America City CELEBRATION

Saturday, September 30
11:00 a.m. to 3:00 p.m.
Old Town Winchester



Event Activities

- ★ Non-profit exhibitors ★
- ★ Live entertainment ★
- ★ City services information ★
- ★ Children's play area ★

Sponsored by:





August 23, 2006

Valley Air Now
c/o Tiffany Turner
10002 Crystal Palace Lane
Spotsylvania, VA 22553

Subject: Opportunity Winchester Street Festival & All-America City Community Celebration

On September 30, 2006, Opportunity Winchester will hold its 3rd Annual Street Festival in partnership with the City's All-America City Community Celebration. This fun event will be held on the Old Town Mall from 11:00 a.m. to 3:00 p.m. and outdoor booth space is available for local non-profit organizations such as yours.

Opportunity Winchester is a citizen-led initiative supported by City government whose purpose is to define and implement a shared vision for the community's future. The initial phase is now complete and a report has been submitted to City Council that recommends ongoing action steps to bring the community's vision to reality. The inaugural Street Festival was held in 2004 to celebrate the community and its volunteer spirit and to gain valuable input from local residents. Since then, the Street Festival has continued to be a successful event that local organizations and residents look forward to attending.

The Festival and Celebration is an event where the community's non-profit organizations can:

- reach out to Winchester residents;
- exhibit their role in the community;
- recruit helping hands; and
- provide ways for residents to help their All-America City.

The main goal of this dual event is to celebrate the community by fostering community pride, providing a way for area residents to get more involved in the community, and helping area organizations gain exposure.

Spaces at the Street Festival are available to non-profits at no charge for a 10'x10' display space. Tables and chairs will be provided to all organizations that register in advance. Enclosed is a registration form. If you are interested in participating, please complete the application and return it to Amy Simmons at 15 North Cameron Street, Winchester, VA 22601. Please call Amy at 533-0603 if you should have any questions.

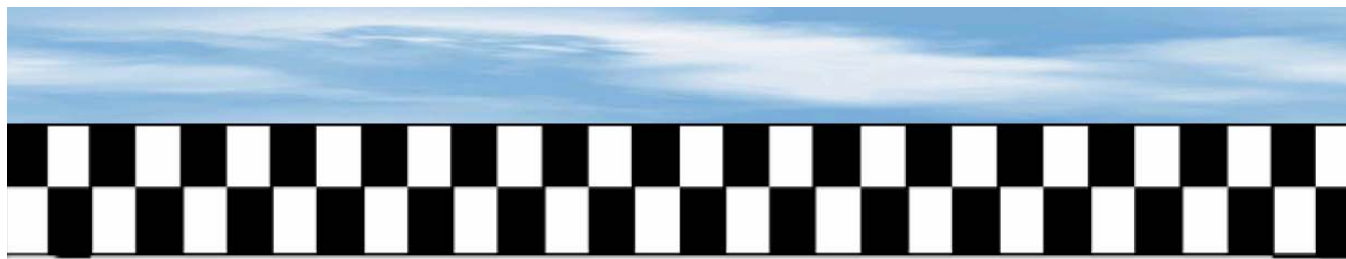
Thank you and hope to see you at the Festival!


Jim Riley
Opportunity Winchester

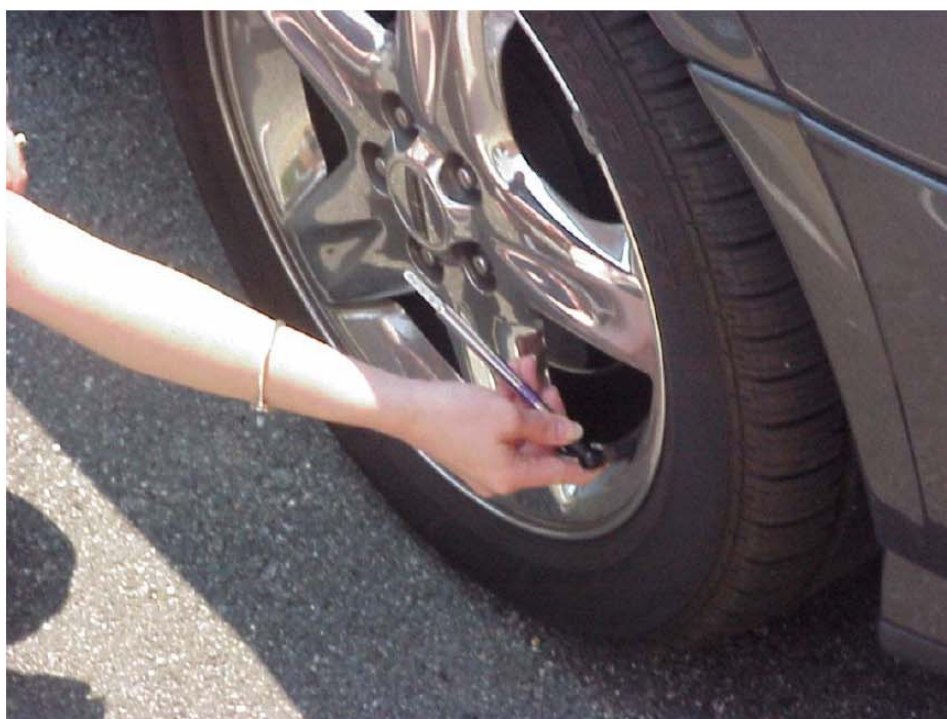


Appendix L

Clean Air Champions Program Materials



What's Your PSI?



Clean Air Champions Campaign



Improving Life, One Breath at a Time

www.valleyairnow.com

Good Morning/Afternoon, (Introduce Yourself). I'm here today to share with you some very important information about air pollution and what you can do to help clean up the air. The Clean Air Champions Campaign is a collaborative effort of the American Lung Association of Virginia, the Virginia Department of Environmental Quality, and Valley AIRNow.



America and Cars



www.valleyairnow.com

Every day, most of us get in a car and drive. We adjust the temperature, maybe turn on the radio, and flip on the fan, never considering that the “fresh air” coming from outside is afloat with fine particles; combustion products, sulfates, nitrates, metal dust, and even microscopic bits of ground-up concrete and rubber tire. Some of it comes from vehicle exhaust and some is stirred up and re-suspended by passing cars and trucks. For most people, brief exposures will not cause any lasting harm. After all, particles are all around us; we breathe them constantly. But in sensitive individuals, or people who are exposed over a long term, this pollution can cause real damage, or even kill.



CLEAN AIR CHAMPIONS CAMPAIGN

Facts about Air Pollution

Why taking Care of your Car is Good for You and Good for your Lungs

How you can get involved in the Clean Air Champions Campaign.

www.valleyairnow.com

It's well known that car and truck emissions contribute to air pollution. Dirty air can make it more difficult for people to breathe. What you may not know is that there are simple steps you can take to reduce your car or truck emissions. By taking these steps, you will be helping people, including at risk populations like your grandparents and children with asthma to breathe easier. Lastly, I'll tell you how you can get involved in our statewide Clean Air Champions campaign. Let's begin with learning more about air pollution.

valleyairnow **AMERICAN
LUNG
ASSOCIATION®**
of Virginia

Ozone Pollution



Ozone is a powerful irritant that burns our lungs and airways, causing them to become inflamed, reddened, and swollen.



Healthy lung



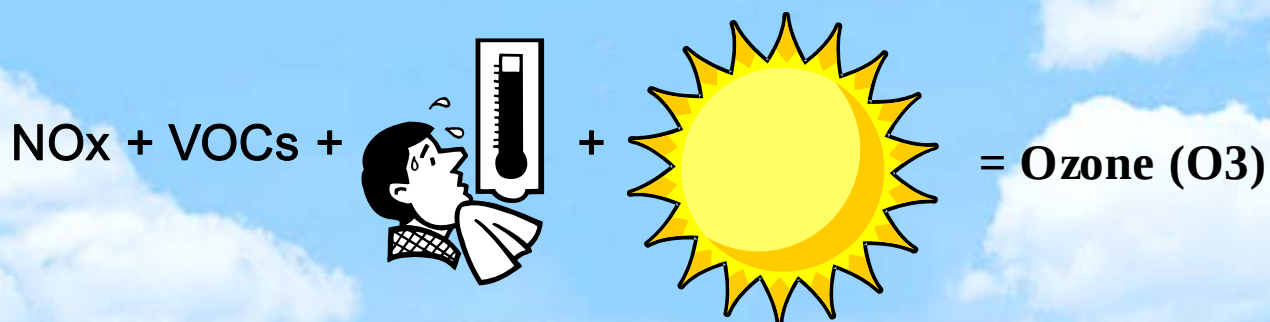
**Inflamed
lung**

www.valleyairnow.com

There are two air pollutants in Virginia that we're working to control so that the public is protected. The first one is ozone pollution. Ozone pollution is created when sunlight mixes with chemicals in the air from mobile sources like cars and trucks or stationary sources like power plants during the summer. Many people call this type of pollution "smog". During the summer months, some of you may have heard ozone advisories warning the public when ozone levels are forecast to be unhealthy.

What is Ozone Pollution?

- Sometimes called smog
- Created in the atmosphere



www.valleyairnow.com

Ozone pollution is created in the atmosphere with nitrogen oxides or NO_x and volatile organic compounds mix with heat and sunlight to create ozone. Remember, this is low level ozone pollution not the ozone layer that is high in the atmosphere and protects us from the sun.



OZONE POLLUTION

2.7 million Virginians live in areas with unhealthy ozone pollution

Children, senior citizens and people with respiratory diseases, like asthma, are particularly vulnerable to ozone pollution

www.valleyairnow.com

Approximately 2.7 million Virginians live in areas with unhealthy ozone pollution. Those most vulnerable to ozone pollution are children, senior citizens and people with respiratory diseases like asthma.

Source: American Lung Association State of the Air Report 2005

OZONE POLLUTION

Health effects include:

- Coughing and wheezing
- Asthma attacks
- Reduced lung function
- Chest pain
- Birth defects
- Premature mortality

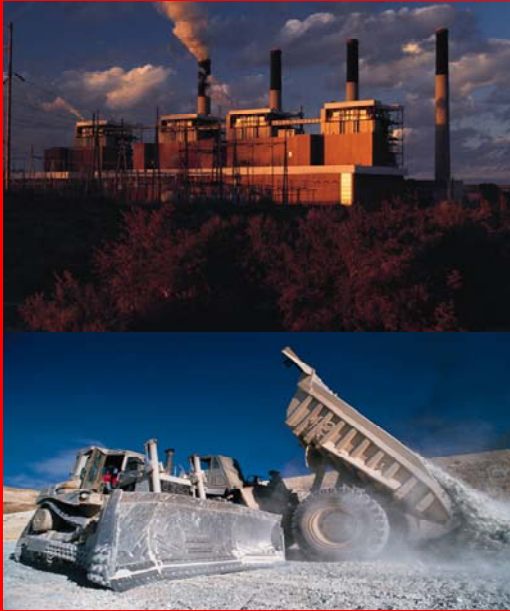


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Some of the noted health effects include: (Read List)



Particle Pollution



Fine particles are so small they bypass the body's natural defenses and penetrate some of the most fragile parts of the lung, causing serious respiratory and cardiovascular problems.

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The second pollutant that Virginia works to control is particle pollution. Particle pollution comes from stationary sources like power plants, mobile sources like diesel trucks, but particle pollution also comes from dust or pesticides in rural areas or from natural fires. These particles are so fine that they cannot be coughed up or blown out through your nose. They penetrate the most fragile parts of the lung. The lungs are our main point of contact with the environment around us – we breathe 50 to 60 pounds of air a day so that makes them vulnerable to airborne gases like ozone or fine particle pollution.



PARTICLE POLLUTION

323,000 Virginians live in areas with unhealthy short-term particle pollution

Senior citizens, people with heart and lung diseases and children are most vulnerable to particle pollution

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There are 323,000 Virginians living in areas with unhealthy particle pollution. Those most vulnerable to particle pollution include senior citizens, people with heart and lung diseases and children.

Source: American Lung Association State of the Air Report 2005

PARTICLE POLLUTION

Health effects include:

- Coughing and wheezing
- Asthma exacerbations
- Respiratory Irritation
- Heart Attacks
- Irregular Heartbeat (cardiac arrhythmias)
- Premature Death

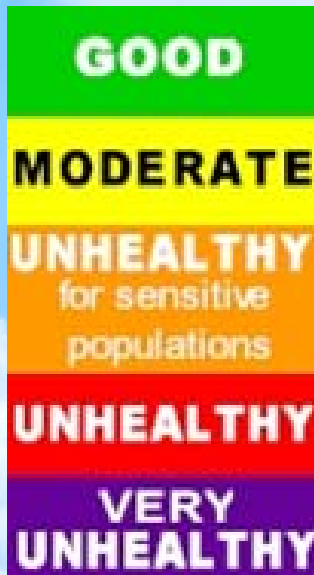


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People exposed to particle pollution can have the following health effects (Read List)



Air Quality Index



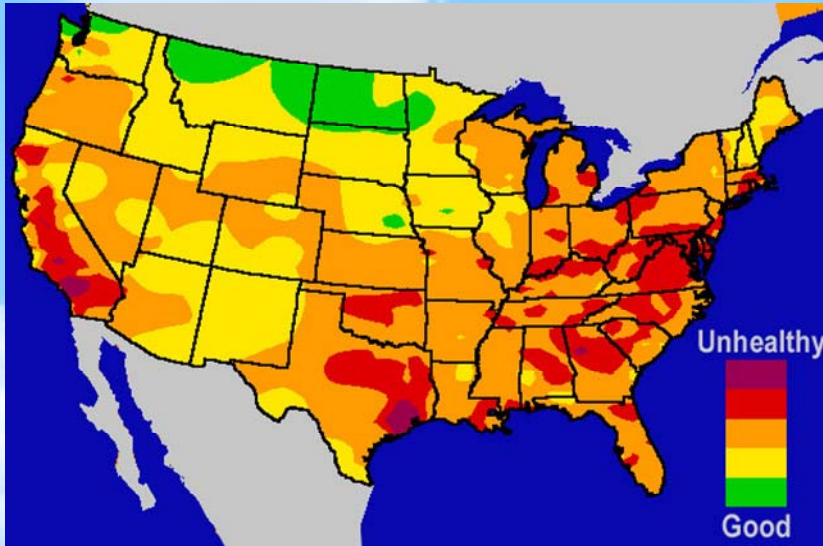
- Developed by EPA
- Yardstick for reporting air quality
- Translates monitored pollution levels into recommendations for action
- Used across the nation

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The EPA and your State environmental agency measure pollution in the air. Then they use the Air Quality Index, or AQI, to tell the people about the air. An index can be a quick way to tell people how good or bad something is. The AQI uses colors, and numbers, and words to tell you about the air.



EPA maps real-time pollution levels



www.epa.gov/airnow

www.valleyairnow.com

EPA maps real time pollution levels which you can find by visiting the website listed on the slide. It's really cool to watch.



CAR CARE:



Good for You
Good for Your
Lungs
Good for Your
Community
Good for Virginia!

www.valleyairnow.com

Motor vehicles contribute about one half of the total amount of air pollution in the United States today. In compliance with the Clean Air Act, car makers have reduced the amount of pollution that comes out of the tailpipe. New cars are estimated to run 90% cleaner than those made 20 years ago. Yet it's up to us to keep them that way. Unmaintained cars can go out of adjustment, causing them to work harder, wear out faster, and pollute more. So the benefits of car care include saving money on gas and repairs, increasing the engine life of your vehicle, improving your car's performance and doing your part to reduce breathing problems for people with lung and heart disease.

Source: American Lung Association

CAR CARE TIPS

Keep your vehicle maintained according to the Manufacturer's specifications

- Regular Service
- Severe Service



www.valleyairnow.com

Your manufacturer will recommend maintenance schedules for both regular or severe driving conditions. If any one or more of these conditions is true, you may need to following the “severe service” schedule in your owner’s manual:

Most of your driving trips are less than 4 miles.

Most trips are less than 10 miles and outside temperatures are below freezing.

The engine is operated at low-speed most of the time (as in door-to-door delivery or stop-and-go traffic)

The vehicle is operated in dusty areas.

The vehicle regularly tows a trailer or carries the maximum vehicle load.

If you don’t have a copy of your vehicle owner’s manual, you can order a replacement from a local dealership that sells your make of car or truck.



CAR CARE:



Benefits of Keeping your Vehicle Serviced or Tuned

- Better Gas Mileage
- Money in Your Pocket
- Extended Life of Your Car
- Fewer Vehicle Emissions

www.valleyairnow.com

Just getting a tune-up for your car, truck, van or SUV can improve gas mileage an average of 4.1%

Using the proper grade of oil recommended in your vehicle's owner's manual can improve fuel mileage up to 2%

Sources: US Dept of Energy, US EPA

CAR CARE TIPS

When your vehicle is serviced, have your mechanic check for:

- Incorrect carburetor adjustment (on older models that have carburetors)
- Damaged catalytic converter
- Fouled spark plugs
- Poorly adjusted ignition timing
- Clogged PCV system
- Dirty air filter

www.valleyairnow.com

Anything that affects your car's ability to burn gasoline as completely and efficiently as possible will increase air pollution. To keep your car's emissions to a minimum, have your mechanic check for the listed items.

Replacing a faulty oxygen (O₂) sensor can improve your fuel mileage up to 40%

Replacing worn or fouled spark plugs, which cause your engine to perform poorly, can improve fuel mileage as much as 12%

And replacing a clogged air filter can improve gas mileage up to 10% resulting in a savings of over 15 cents per gallon!

Sources: US Dept of Energy, US EPA, Advance Auto

PCV is Positive Crankcase Ventilation

CAR CARE:



Check your Tire Pressure and Keep your Tires Properly Inflated

www.valleyairnow.com

Under-inflation causes increased tire wear and decreased gas mileage. The softer your tires are, the greater the friction between the road and the rubber so the harder your engine will have to work to get where you're going. Being off by as little as four pounds of pressure can reduce your mileage by 10 percent. This doesn't mean you should over-inflate your tires. Too much air in your tires can seriously jeopardize your car's handling or even explode. You can find the correct tire pressure for your vehicle on the inside door to the glove compartment or on the drivers' side door pillar.

Note that the manufacturer recommendations are based on "cold tire pressure". Tire pressure should be checked while the tires are cool, for example, before the car has been driven in order to get an accurate reading. As vehicles are driven the tires heat up increasing the pressure in the tires and checking the pressure while warm or hot will give a false reading.

Sources: US Dept of Energy, US EPA, CarTalk



CAR CARE TIPS

Protect Your Gas Cap
Remove Unwanted Weight from Your Vehicle
Keep Your Car Clean
Drive Gently at Moderate Speed
Fill up Your Tank After Dusk on Summer Days
Combine Trips



www.valleyairnow.com

About 17% of vehicles have damaged, loose or missing gas caps which results in the vaporization loss of 147 million gallons of gasoline each year.

An extra 250-500 pounds of weight in your car can result in a 1-2 mile per gallon loss of fuel economy (just don't remove your spare tire)

Keeping your car washed and waxed improves aerodynamics and improves fuel economy. A website devoted to stretching your dollars (stretcher.com) reports a 7% improvement in fuel economy from keeping your vehicle washed and waxed.

Driving gently at moderate speed, using smooth acceleration and gentle stops will save gas and engine wear

Filling up your tank after dusk on hot summer days can help improve the air. Gasoline vapors can react with sunlight and heat to add to the ozone problem in your community.

Filling up after dark takes away one essential ingredient in making ozone – sunlight.

Link short trips together. Starting a cold engine burns more gas and releases more pollution than restarting a warm car.

Sources: Car Care Council, EPA National Vehicle and Fuel Emissions Laboratory



CLEAN AIR CHAMPIONS



Virginia Campaign

- High School Education
- Media Advertisements
- NASCAR Races
- Spokesperson – Ward Burton
- Clean Air Champion Pledge

www.valleyairnow.com

The American Lung Association of Virginia, the Virginia Department of Environmental Quality and numerous other stakeholders have launched a statewide campaign to raise awareness of the benefits of keeping your car properly maintained and how your individual actions can improve the quality of the air we breathe. The Virginia Campaign includes educational presentations to new drivers across Virginia like you, media ads featuring our spokesperson, Winner of the Daytona 500, NASCAR Driver – Ward Burton, educational booths at Virginia NASCAR races and collecting Clean Air Champion Pledges from Virginia Drivers.



Other Ways You Can Help

Walk, roller blade or bike to your destination

Use public transit like the bus, train or metro

Carpool or vanpool to practices or events

When purchasing a new vehicle, look for one with low emissions, such as a hybrid.

Be aware of AQI forecasts

www.valleyairnow.com

Read list



Clean Air Champions



www.valleyairnow.com

Questions?

Appendix M

Global Learning and Observations to Benefit the
Environment (GLOBE) Surface Ozone Protocol

Surface Ozone Protocol



Welcome

Introduction

Protocols

Learning Activities

Appendix

Purpose

To measure ozone concentrations at ground level

Overview

Students deploy a strip of paper that changes color in the presence of ozone. They use an ozone reader to determine the amount of ozone in ppb as indicated by the color change of the paper strip.

Student Outcomes

Students will learn to measure the concentrations of ground-level ozone in the atmosphere and to observe changes in the concentrations over time.

Science Concepts

Earth and Space Science

- Weather can be described by quantitative measurements.
- Weather changes from day to day and over the seasons.
- Weather varies on local, regional, and global spatial scales.
- The atmosphere is made up of different gases and aerosols.
- Materials from human societies affect the chemical cycles of the Earth.

Geography

- Human activities can modify the physical environment.

Atmospheric Enrichment

- The concentration of surface ozone varies over time.
- Cloud cover, air temperature, wind direction and humidity affect ozone concentration.
- Air quality is affected by the concentration of ozone present.

Scientific Inquiry Abilities

- Use ozone strips and a strip reader to measure *in situ* ozone concentrations.
- Use a weather vane to identify wind direction.
- Identify answerable questions.
- Design and conduct scientific investigations.

Use appropriate mathematics to analyze data.

Develop descriptions and explanations using evidence.

Recognize and analyze alternative explanations.

Communicate procedures and explanations.

Time

Two five-minute time periods, one hour apart

Level

All

Frequency

Daily

Measurements starting within one hour of local solar noon are preferred.

Materials and Tools

- Ozone Data Sheet
- Clipboard
- Pencil or pen
- Chemical test strip in sealable plastic bag
- Ozone Test Strip Scanner
- Ozone Measurement Station
- Device to measure wind direction
- GLOBE Cloud Chart
- Instrument Shelter with Thermometer
- Sling Psychrometer OR Digital Hygrometer
- Clock or watch

Preparation

Assemble and install Ozone Monitoring Station.

Assemble or obtain and install Wind Direction Instrument.

Prerequisites

- Cloud Protocols
- Relative Humidity Protocol
- Maximum, Minimum and Current Temperature Protocol OR
- Digital Multi-Day Max/Min/Current Air and Soil Temperature Protocol

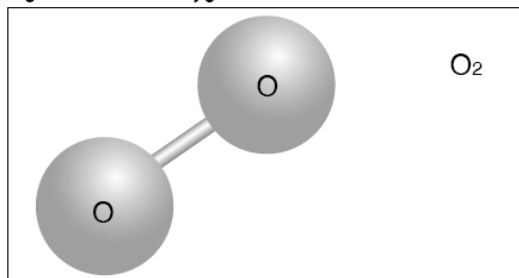


Ozone Protocol – Introduction

Ozone is one of many gases in the air present in small amounts. These gases are called *trace gases*, and they play a role in the complex chemistry that determines the quality of the air we breathe. The amounts (concentrations) of these trace gases vary with time of day, from day to day, and from place to place. These variations are due to variations in the amounts of other gases from which trace gases are formed, and conditions such as air temperature. Monitoring the concentrations of trace gases is important for our understanding of air quality and how it is changing.

The oxygen molecule, consisting of two atoms of oxygen (O_2) (See Figure AT-SO-1) comprises 21% of Earth's atmosphere. Ozone, a molecule containing three oxygen atoms (O_3) (See Figure AT-SO-2) is present in much smaller amounts. Surface ozone can be produced when certain chemicals are released to the atmosphere and these chemicals react with each other in the presence of sunlight. Ozone is an important trace gas because it is very reactive, which means that it will easily 'stick' to, and react with all surfaces, including living tissue.

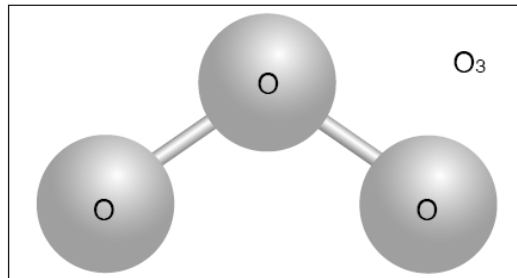
Figure AT-SO-1: Oxygen Molecule



Ozone exists in both the stratosphere and troposphere; 90% of the ozone is found in the stratosphere, leaving a small amount in the troposphere. The ozone located in the stratosphere is often called 'good ozone' because it absorbs much of the sun's ultraviolet rays and protects the life forms on Earth. In contrast, the additional ozone that occurs in the troposphere is 'bad ozone' and is considered a pollutant. It is the main component of smog. Sometimes the term 'photochemical smog' is used, which is the correct term for pollution found near most urban areas. This type of smog is a product of chemical reactions in the atmosphere that take place only in the presence of sunlight.

Ozone is often one of the more abundant trace gases in the atmosphere and GLOBE students can measure it using simple chemical test strips. Collecting surface ozone data will provide a record of the amount of ground level ozone found in different geographic regions at different times. These data will help scientists understand how weather conditions influence the amount of ozone in the air. The GLOBE database will contribute valuable information for understanding how Earth's atmosphere may be changing.

Figure AT-SO-2: Ozone Molecule



Teacher Support

The Measurement

The GLOBE surface ozone measurement is taken using a chemically sensitive strip that changes color in the presence of ozone. The more ozone present, the more change that will occur. The chemical strip is placed in the clip of the monitoring station preferably within one hour of local solar noon and left exposed to the air for one hour. It is then read using a scanner, which reads the strip more accurately and precisely than the eye, enhancing the scientific value of these data.

The amount of color change will increase if the strip is exposed to ozone for a longer period of time. Therefore, to ensure that GLOBE data are comparable around the world, the protocol specifies that the strip be exposed for only one hour and that the time it is exposed and the time it is read are reported to GLOBE to the nearest minute.

Placing the Chemical Strip

The chemical strip is exposed to outside air that is moving freely around the monitoring station. It is important to keep the strip in a closed plastic bag or pouch until it is placed in the monitoring station because once the strip is exposed it begins to react with any ozone that is present. When placing the strip, avoid touching the chemical on the strip to prevent contamination; however there is no danger should someone touch the strip.

Reading the Chemical Response

Reading of the chemically sensitive strip must be completed in the field. The team collecting the information records the level of response on the *Ozone Data Sheet*.

Determining the Level of Surface Ozone

The hand held scanner provides a more sensitive reading of the color of the ozone test strip than can be achieved with the naked eye. The scanner is designed to give a reading of ozone concentration in units of parts per billion. The correspondence between the color of the strip and the average concentration of ozone in the air during the time the strip was exposed assumes that the exposure was for just one hour.

Place the chemical strip into the thin slot on top of the scanner. Hold the edge of the chemical strip on the end with the words "Test Card". The chemical side of the strip should face the display. Gently slide the strip into the slot on top of the scanner until the bottom of the strip touches the base of the scanner and won't slide in any further. This places the circle with the chemical in the center of the end of the scanner. It will take a few seconds for the scanner to read the color change of the strip, and identify the ozone concentration in parts per billion.

Measurement Logistics

The need to expose the ozone strip for one hour may pose a logistical challenge. One approach to solve this is to expose the ozone strip at the same time that the daily atmosphere measurements of maximum, minimum, and current temperature, precipitation, relative humidity, and clouds are made within one hour of local solar noon. These measurements will then provide one set of the cloud and current temperature measurements required to support the ozone measurement. Students would also read wind direction at this time.

Just a few minutes before an hour has passed students need to go to the site to measure the concentration of ozone detected by the strip. At the same time, they will need to open the instrument shelter and read the current temperature, do the *Cloud Cover* and *Cloud Type Protocols*, and again observe the wind direction. Unusual weather conditions that may have affected the response of the strip are reported as comments or metadata. The students who read the ozone strip do not have to be the same students who exposed the strip. This gives you some flexibility to work within the constraints of the school day and student schedules.

The key to this two time measurement is to establish a clear schedule so that everyone involved knows what they are expected to do and when to do it. Design a system so students know when the hour is nearly finished, and return to the site to read and record the data.

Ozone concentrations often vary over the day. To build a consistent set of ozone readings that can



be compared across many schools, the primary data set desired is of measurements for a one hour period that begins within one hour of local solar noon. This should require the least effort as noted above. If this timing will not work at your school or if you wish to take more than one ozone measurement a day, you may do this protocol at other times. These data may not be displayed on GLOBE visualizations of mid-day ozone values, but they will be included in the tables of data associated with your school and will be made available in graphs. The key is that the ozone strip is exposed for one hour and that clouds, current temperature, and wind direction are reported for both the beginning and end of this time period.

Scanner Use and Care

An ozone measuring hand-held scanner is used to measure the level of ozone present in the atmosphere. It is important to read the handheld scanner in a shaded area with the scanner placed on a level stable surface. Sunlight and motion can affect the scanner reading.

Placing the scanner inside the instrument shelter provides the level shaded surface needed to take the ozone measurement. The instrument should be inside the GLOBE Instrument Shelter for 5 minutes to allow it time to adjust to the outside conditions. During these 5 minutes, students should be recording cloud cover, temperature, and wind direction data. After recording these data, the students will return to the instrument shelter, turn on the scanner, and wait 30 seconds to allow the internal electronics to stabilize. The scanner will automatically turn off. Turn it back on immediately to calibrate the unexposed ozone test strip. These same steps should be repeated when the students return to the site to read the exposed ozone test strip. The scanner must be brought back into the classroom after calibrating the unexposed strip as well as after reading the exposed strip.

The ozone measuring hand-held scanner is a rugged instrument, but care must be taken to ensure accurate measurements.

1. Keep the scanner at room temperature and in its protective case to protect it from dirt and dust when it is not in use.

2. Go to RESET and reset the scanner each day to MODE 01
3. When the scanner is turned on to calibrate the unexposed strip or read the exposed strip, be careful not to accidentally touch or bump the two buttons on the edge of the scanner. If the buttons are touched without a strip in the scanner, the scanner will respond by trying to save a reading without a strip and you will not have an accurate ppb reading. The scanner will need to be recalibrated with an unexposed strip to reset the white paper reading.
4. The test strip scanner is sensitive to temperature changes. If the outside temperature is not within 5° C of the classroom temperature, the scanner should remain inside and the exposed strip should be brought back into the classroom to be read. The time it takes to bring the ozone strip from the monitoring station to the classroom will not significantly impact the ozone concentrations.
5. Turn the scanner off when it is not in use.
6. Do not drop the scanner.
7. Protect the scanner's electronics from water.
8. Change the three AAA batteries when the scanner indicates they have low power.

Supporting Measurements

Since the chemistry of trace gases in the atmosphere depends on the amount of sunlight present, students are asked to record the cloud cover and type when they expose the strip and when they read it. Many chemical reactions also depend on temperature and so students are asked to measure current temperature when the strip is exposed and read. Lastly, the amounts of trace gases present may vary considerably depending on what is upwind from your measurement site. Students also measure the wind direction at the beginning and end of the exposure period.

These supporting data can be compared to data collected from other schools in different locations. As students learn about the air they

breathe, they should explore how weather conditions can affect the amount of ozone in the air around them. Comparing the data they gather with students from other regions of the world is an appropriate topic for student inquiry.

Note: If wind measurements are not available, data from the closest surface weather site (available on the Web) would be important to have in the analysis of the data (as well as for the analysis of other atmosphere protocol measurements). If data are taken from the Web, this fact should be noted in the metadata

Student Preparation.

Students need to be trained how to measure and record the surface ozone level. It will be important to the accuracy of the measurement that students are able to:

1. Work in cooperative groups of 2-4 students to gather, analyze, and discuss results.
2. Organize all materials needed to set up and take the measurement of surface ozone.
3. Follow a schedule to return to the ozone monitoring site 5-10 minutes before strip is to be read to take supporting measurements.
4. Identify and record the starting time when they expose the chemical strip, and accurately read the strip at the end of one hour.
5. Carry the chemically sensitive strip to the monitoring site in a plastic bag to control exposure time.
6. Read and follow the *Ozone Field Guide* instructions for placing and reading the ozone strip.
7. Read the current temperature from the maximum/minimum thermometer without altering the maximum and minimum settings.
8. Identify and record cloud type and cover using the *Cloud Protocols*.
9. Record data accurately and completely for reporting to GLOBE and for future graphing and analysis.

10. Record their observations in their individual GLOBE Science Logs.
11. Respond in their GLOBE Science Logs to a question that reveals the individual nature of their learning experience, share their responses with their team, discuss, and choose to add to their response as a result of their discussion without changing their original response.

Helpful Hints

Have a designated area to keep the clipboard with the *Data Sheet* to facilitate different teams working to record data. Keep the *Data Sheets* in a notebook so that they are not misplaced.

From time to time check the written record in the Data Book to ensure that it is complete and accurate.

Sometimes a chemical strip gets damaged while exposed to ambient air. If the chemical strip gets wet, the response will be marbled. Enter M for data for this day or time period. This will indicate that the measurement was taken, but it was contaminated.

If there is no response on the chemical strip, enter 0 to indicate no surface ozone is present.

Questions for Further Investigation

Is the amount of ozone you observe related to other atmosphere phenomena? Which ones? How?

How can you use your data collected over a period of time to predict future changes in the atmosphere?

What is the variability of ozone in the atmosphere daily? Seasonally? Annually?

Exposing the Ozone Test Strip

Field Guide

Task

Begin the measurement of surface ozone concentration.

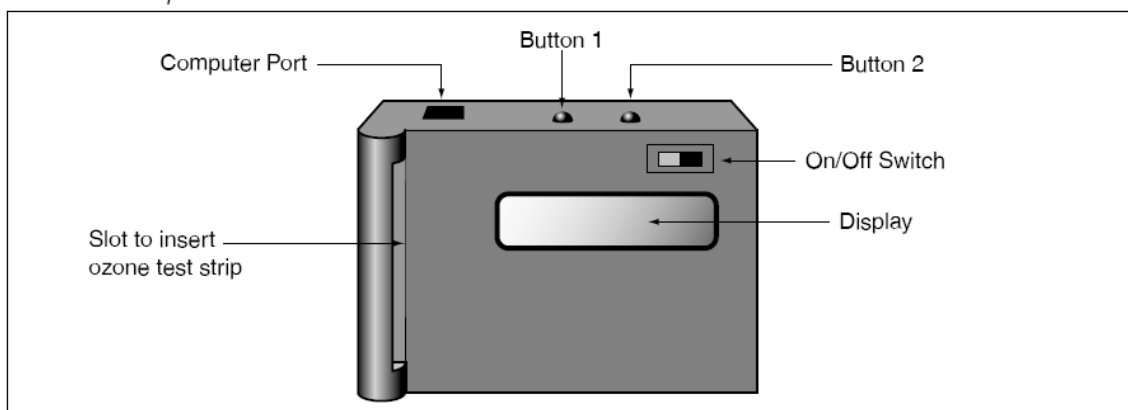
Record cloud conditions, current air temperature, wind direction, and relative humidity.

What You Need

- ☐ One Ozone Test Strip
- ☐ Plastic bag to carry the test strip to your site
- ☐ Ozone Test Strip Scanner
- ☐ Clipboard
- ☐ Ozone Data Sheet
- ☐ Pen or pencil
- ☐ Sling Psychrometer OR Digital Hygrometer
- ☐ Measuring Wind Direction Field Guide
- ☐ Cloud Cover Field Guide
- ☐ Cloud Type Field Guide
- ☐ Sling Psychrometer Field Guide OR Digital Hygrometer Field Guide
- ☐ GLOBE Cloud Chart
- ☐ Wind Direction Instrument
- ☐ Key to your instrument shelter
- ☐ A clock or watch accurate to the nearest minute

Note: If using the digital hygrometer to measure current relative humidity, it must be placed in the instrument shelter at least 30 minutes before calibrating and placing the unexposed ozone strip and gathering metadata.

Ozone Test Strip Scanner



In the Field or Classroom

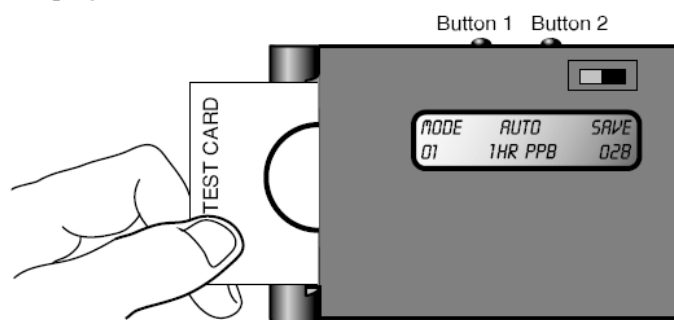
1. Fill out the top of the *Ozone Data Sheet*.
2. Remove a single ozone test strip from the plastic bag,
3. Record the date and starting time.

Calibrating the Scanner

4. Place the scanner on a steady surface out of direct sunlight, preferably inside your Instrument Shelter.
5. Turn on the scanner and you should see the following in the LCD readout. (Older scanners may display 170 for the number under SAVE and need to be recalibrated. Contact the GLOBE Help Desk for assistance.)



6. Place the unexposed ozone test strip into the scanner with the **chemical side facing toward the display**.



7. Press button 1 (left button) until you see SELECT> CALIB on the display.
8. Press button 2 (right button) and you will see 1 HR WHT = and fluctuating numbers. This is ok.
9. Press both buttons simultaneously to save unexposed strip reading.
10. Turn off the scanner, and remove the unexposed strip. (NOTE: turning off scanner before removing the strip will prevent accidentally changing the settings in the scanner)

In the Field

11. Place this ozone test strip in the clip on the monitoring station. Do not touch the chemical part of the strip at any time. (It is not harmful to you, but touching it may prevent you from getting an accurate measurement.) Record the time.
12. Determine cloud cover and cloud type following the *Cloud Cover* and *Cloud Type Protocols*.
13. Measure and record the current temperature on the thermometer in your instrument shelter (to the nearest 0.5° C).
14. Record the wind direction.
15. Measure and record the relative humidity using either a sling psychrometer or digital hygrometer.

Reading the Ozone Test Strip

Field Guide

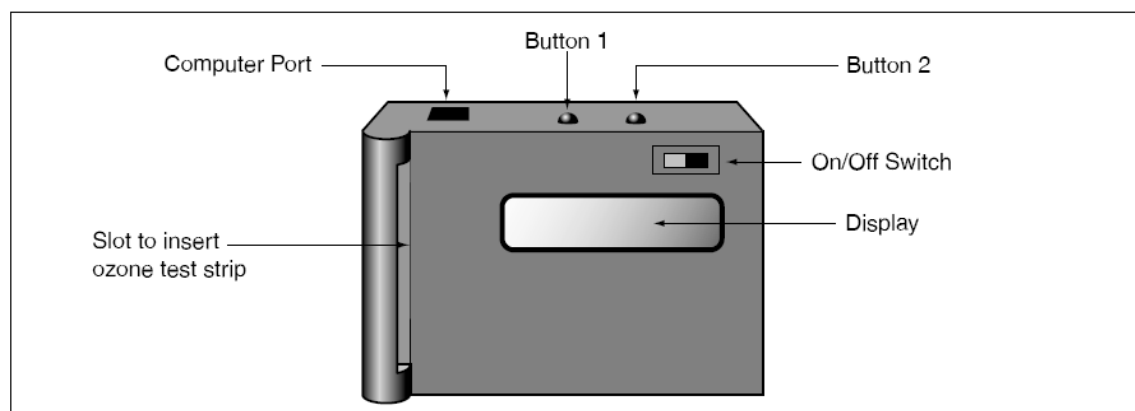
Task

Complete the measurement of surface ozone concentration after the ozone test strip has been exposed for one hour.

Record cloud conditions, current air temperature, wind direction, and relative humidity.

What You Need

- ☐ Ozone Test Strip Scanner
- ☐ Clipboard
- ☐ Ozone Data Sheet
- ☐ Pen or pencil
- ☐ GLOBE Cloud Chart
- ☐ Sling Psychrometer OR Digital Hygrometer
- ☐ Cloud Cover Field Guide
- ☐ Cloud Type Field Guide
- ☐ Measuring Wind Direction Field Guide
- ☐ Sling Psychrometer Field Guide OR Digital Hygrometer Field Guide
- ☐ Wind Direction Instrument
- ☐ Key to your instrument shelter
- ☐ A clock or watch accurate to the nearest minute



In the Field

1. Place the scanner in the instrument shelter and turn it on. Let it run 30 seconds to adjust to climate. (Do not touch any other buttons except the on/off switch if scanner turns off) You should see something like the following display:

MODE	AUTO	SAVE
01	1HR PPB	133

2. Remove the test strip from the clip; be careful not to touch the chemical part of the strip.

In the Field or Classroom

3. Slide the strip into the slot on top of the scanner until the bottom of the strip touches the base of the scanner and won't slide in any further. The chemical part of the strip should face the display
4. The reading should stop fluctuating after 5-10 seconds. If it fluctuates between two numbers, choose the lower of the two readings after the test paper has been in the scanner for 10-15 seconds.
5. Record the ppb reading on your *Data Sheet* and turn scanner off. If the reading fluctuates between two numbers, choose the lower of the two readings after the test paper has been in the scanner for 5-10 seconds. Place the strip into a sealed plastic bag.
6. Record the time you read the ozone strip.
7. Determine cloud cover and cloud type following the *Cloud Cover and Cloud Type Field Guides*.
8. Read and record the current air temperature.
9. Determine and record the wind direction.
10. Measure and record the relative humidity using either a sling psychrometer or digital hygrometer.

Note: The new scanner model automatically turns itself off after a minute. If this happens, turn it back on to complete your task. It is not uncommon for the scanner to display more than one value, because of the nature of the electronics in the scanner and the color on the exposed strip is rarely completely uniform (although it may appear that way to the naked eye). It is common that the concentration shown in the display fluctuates among several values and eventually starts to increase the longer the strip remains in the unit. Because the measurement accuracy is 10 ppb, fluctuating numbers within a range of 1-5 ppb are acceptable. The goal of the *Ozone Protocol* is to be able to distinguish between values that are regarded as low (0-20 ppb), normal (30-50ppb) and high (>60 ppb).

Measuring Wind Direction

Field Guide

Task

Determine wind direction using Wind Direction Instrument.

What You Need

☐ Wind Direction Instrument

☐ Ozone Data Sheet

☐ Clipboard

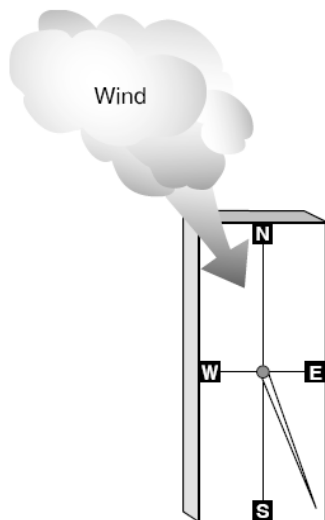
In the Field

1. Place your wind direction instrument on a table or bench so that it is about 1 meter off the ground.
2. Use the compass to find magnetic north and align the base of your model marked N to match true north.
3. Look at the wind sail to see if there is any wind blowing.
4. Put your right hand on your hip and your left arm out straight.
5. Turn your body so that your straight arm is pointing in the same direction as the wind sail. Your right elbow is now pointing in the direction of the wind.
6. Record this direction on your *Data Sheet*.

For example, if your wind sail is pointing south, your straight arm should be pointing south. In order for the wind sail to be pointing south, where does the wind have to be coming from? North.

Your straight arm is pointing where the wind is going, and the elbow of your bent arm is pointing in the direction where the wind is coming from, north. Winds are identified by the direction from which they are coming.

Wind is coming from the **northwest**



Wind sail is being blown towards **southeast**.



Frequently Asked Questions

1. What if the ozone strip does not change color after one hour?

If there is no color change, enter 0 on the data sheet, because it indicates that there is very little or no surface ozone present.

2. What if the ozone strip got wet due to rain or snow and the color is marbled, or the surface is not one complete color?

Your ozone measurement strip is contaminated or spoiled which means the data are not accurate. Report your data as M to the GLOBE Data Server. Note as a comment weather conditions which may have affected your results. Still measure the current temperature, cloud cover and cloud type and report them.

3. We are not in school on the weekend, how can we collect data?

Persistence in data collection is important, so work with your GLOBE team to arrange for a volunteer to bring one or two students to your Atmosphere Study Site on weekends and holidays if possible. Data from school days alone are still valuable, but for some schools weekends will have systematically different ozone levels.

4. Can the plastic disk and strip be placed on the weather station?

No. They should be on different posts.

5. Why is it important to take the temperature reading after recording the ozone level?

The strip will continue to respond to the gases in the air. So it is important to take the ozone reading and then the temperature reading.

6. Why is it important to record the wind direction, cloud cover and type, and current temperature before calibrating an unexposed strip or reading the exposed strip?

The scanner needs time to adjust to the outside conditions. If you return to the monitoring site 5-8 minutes before the hour you have to read the exposed strip, you can place the scanner in the instrument shelter, and record the cloud cover and type, wind direction, and current temperature reading while the scanner adjusts to the outside conditions. Remember that the strip will continue to respond to the gases in the air and it is impor-

tant to read the response of the strip one hour after it was placed.



7. What are some common problems with using the test strip scanner and how can I fix them?

Problem 1: I don't know if my scanner is calibrated correctly

To check the calibration of the scanner, first turn the scanner on and reset it. Go to CALIB and place an unexposed strip in the Scanner. Push the right button, button #2, and let the scanner read the unexposed strip for 1 minute. Record the lowest and highest readings. A large range (> 5 ppb) between the lowest and highest readings, or a reading of 180 or higher indicates a scanner problem. Contact the Vender and return the scanner for repairs.

Problem 2: The reading under "SAVE" is a Range of Low Fluctuating Numbers

The scanner was calibrated without an unexposed strip. Push the left button, button #1, until CALIB shows on the LCD. Place an unexposed strip in the scanner, push the right button, button #2, and then hold both buttons down simultaneously to reset the calibration for an unexposed strip. The scanner should return to SAVE 170.

Problem 3: The LCD Reads 8HR PPB or AQI When the Scanner is Turned On

If settings have been changed the reading under SAVE will also be different. Someone has changed the SETTING categories in the scanner. Push the left button, button number 1 until SETTINGS appear on the LCD. Push the right button, button #2, and you will see DRATION = 8HR. Push the right button until you see DRATION = 1HR. Push the left button and it will show MEASURE = AQI. Push the right button until it scrolls to MEASURE = PPB and push the left button. Now push both buttons simultaneously to save the settings and return to the original screen on the LCD. It should read:

MODE	AUTO	SAVE
01	1HR PPB	170



8. Can I determine that there may be problems with my measurements based on my scanner's readings? If so, how can I diagnose and correct these problems?

Before taking measurements each day, it is beneficial to turn on the scanner and push the left button until "Reset" shows on the LCD, and push both buttons to reset the scanner to MODE 1. However, even resetting the scanner before using it each day may not prevent minor problems from occurring. Occasionally the response of the scanner indicates something has been changed within it, and resetting the scanner will not be enough to correct the problem. Some of these problems and their solutions are identified below.

Note: At the time of placing the strip and again when reading the exposed strip the following must be done:

- Scanner placed in ambient air for 4-5 minutes to allow it to acclimate to environmental conditions.
- Scanner turned on for one minute to enable it to stabilize, and when it shuts off immediately turn it back on, give it a few seconds to stabilize and then calibrate the unexposed or read the exposed strip.

Problem 1: The range of readings of an unexposed strip may indicate a problem with the scanner.

Solution: Turn on the scanner. Reset it. The correct Readings on the LCD are: MODE 01 1 HR PPB and 135 (if reads 168-170, the scanner needs updating, contact the GLOBE Help Desk). Place the unexposed strip in the scanner and push the left button until you read "CALIB". Push the right button and let the scanner read the unexposed strip for 1 minute. Record the lowest and highest readings. For example, the range of numbers may fluctuate, but the fluctuation is near or about 5 ppb. However, if the fluctuation has a much larger range than 5 numbers from the lowest number to the highest number, or the range of readings

are higher than 180, contact the manufacturer to determine whether or not the scanner needs to be repaired.

Problem 2: Readings under "SAVE" are low, fluctuating numbers, when scanner is turned on.

Diagnosis: The scanner needs to be calibrated **with** an unexposed strip. Someone set the calibration without using a strip.

Solution: Push the left button until you reach "Calib". Place an unexposed chemical strip into the scanner and push the right button to activate the reading of the **unexposed strip**. Hold both buttons down to lock in on the calibration. Before removing the unexposed strip, the reading under "SAVE" should be 000 or 001. If it goes higher than 001, calibrate the scanner again with the unexposed strip.

Problem 3: LCD reads 8 hr instead of 1 HR or AQI instead of PPB, when the scanner is turned

Diagnosis: Either of these readings will also affect the reading under SAVE. Someone has changed the "DATA" categories in the scanner.

Solution: Push the left button until you have "DATA".

Push the right button to read the first category under "DATA" then,

Push the left button to scan through the list of categories - until the LCD reads the category "GAS" - then push the right button to read the subcategories under "GAS " until it reads "ozone"

Push the left button again and it saves the category, "ozone" and scrolls to the next general data category called MEASURE=.

Push the right button until it shows PPB and push the left button to save it.

The scanner will automatically scroll to "DURATION" or the time the strip will be exposed.

Push the right button until the DURATION=1HR and push both buttons simultaneously to save the corrected "DATA" category settings.

Surface Ozone Measurement - Looking at the Data

Are the data reasonable?

Average surface ozone measurements can range from nearly 0 ppb to over 150 ppb (and even 200 ppb in extremely polluted conditions). Research has shown that different areas experience different levels of surface ozone depending upon time of year, location, and the level of hydrocarbons and nitrogen oxides in the air, since they are the precursors needed to produce ozone near Earth's surface.

Students taking daily measurements over several weeks should observe a range of ozone levels. Often, there is a gradual build-up over several days, and then concentrations drop over a shorter period of time. Students should take particular note of the wind direction and temperature over this several-week period along with the passage of weather fronts. Has the wind shifted? Are there days when there is a heavy overcast and the ozone levels show unusually low values? On a longer time scale, how do surface ozone measurements vary with season and from one year to another? Gaining experience with the variations in ozone concentration at your own site is the best way to judge whether individual measurements are reasonable.

Although surface ozone concentrations can be quite variable, there are some correlations that usually apply. Sunlight drives some of the chemical reactions in the atmosphere which lead to the formation of ozone. Therefore, it is reasonable to expect higher surface ozone concentrations in the summer than in the winter. In low latitudes, where the amount of sunlight is relatively constant (and high) throughout the year, highest surface ozone values are found most often if there is a seasonal source of the precursors needed to generate ozone. Thus, in many tropical areas, surface ozone levels will likely increase if there is a preferred time of the year when biomass burning takes place. This seasonality may be linked to the region's dry sea-

son, since it is easier to burn vegetation after it has dried out over a period of several weeks.

On shorter time scales, heavy cloud cover and low surface ozone concentrations are often observed at the same time. It is unlikely that high concentrations would be present if it is raining. When there is little or no wind, local concentrations of the chemicals leading to ozone formation can build up. Under these conditions, the ozone formed locally is not carried away and is not diluted with air from higher in the troposphere where ozone concentrations are generally lower. The chemical processes leading to ozone production happen more rapidly under warmer conditions.

What do people look for in these data?

Monthly data gathered at fixed times

One method of collecting data is to measure ozone every day for a specific period of time, usually for at least one month, and hopefully longer. An example of a 1-month data record is presented in Table AT-SO-1.

This is a typical data set that would be gathered by students at the same time every day. Plotting ozone concentration versus temperature does not reveal any strong correlation; for example, both the warmest day (11/1) and the coldest day (11/23) have the two highest ozone readings (55 and 46 ppb). There is, however, a general tendency for concentrations to be lower when the temperatures are colder: From the 10th through the 25th, temperatures are below 20° C and the ozone concentrations average 15 ppb. When the temperatures are >20° C and it is not raining, the average concentration is 38 ppb., more than twice as high as when it is relatively cool. The other very important factor in this analysis is the wind direction. When the wind is from the south or southwest, the average concentration is 41 ppb. For this particular data set, the wind direction appears to be the primary factor signaling higher concentrations. The reasons for this finding may be simple, or they may be complex. For example, is there a large metropolitan area located nearby and when the air is from the south, are you downwind of a large pollution



Table AT-SO-1 **Heart of Mary School--ppb Ozone and Metadata**

Date	ppb	Ending Temp	End Time	Cloud Type	Cloud Cover	Wind Direction (beginning/ending)	Notes
11/1/00	55	28	12:50	Cirrostratus, Cumulonimbus	Broken	SW/SW	
11/7/00	19	26	12:30	Stratocumulus	Overcast	SW/SW	Heavy rain
11/8/00	12	26	12:25	Stratocumulus	Overcast	SE/SE	Light rain
11/9/00	35	24	12:25	None	No clouds	NW/NW	
11/10/00	13	14	12:15	None	No clouds	NW/NW	
11/11/00	15	16	12:25	None	No clouds	W/NW	
11/14/00	22	14	12:30	Cirrus	Scattered	NW/NW	
11/15/00	16	14	12:30	Cirrostratus	Scattered	NW/NW	
11/17/00	13	5	12:30	Cirrostratus	Overcast	NW/NW	31 mm of rain
11/20/00	14	14	12:40	None	No clouds	NW/NW	
11/21/00	13	9	12:25	None	No clouds	NW/NW	
11/22/00	16	12	12:45	Cirrostratus	Clear	NW/NW	
11/23/00	46	6	12:15	Nimbostratus	Overcast	S/S	
11/25/00	16	15	1:00	Nimbostratus	Overcast	W/W	
11/27/00	31	21	12:30	None	No clouds	SW/SW	
11/28/00	30	20	12:40	Cirrus	Overcast	SW/SW	
11/29/00	40	21	12:30	Cumulus	Clear	W/W	

source? Such an effect is often observed in the Los Angeles basin where highest concentrations of ozone are primarily found in the suburban areas downwind from the metropolitan area. Another reason may be due to the placement of the ozone monitoring site if, for example, there is an open field to the south and a forested region to the north. Ozone is destroyed as it comes in contact with leaves on a tree, so a fetch of air from the north in this case could be lowering the amount of ozone observed at the monitoring site. In this particular example, the metadata are extremely important for data interpretation.

An Example of a Student Research Investigation

Forming a Hypothesis

A student of Heart of Mary School in Alabama has decided to focus on the interconnections of atmospheric conditions on the level of surface ozone observed. She has decided to begin her research process by looking at the visualizations of measurements of the ozone level and current temperature at her school for the month of April. Her initial hypothesis is *the level of surface ozone produced is directly related to the current temperature.*

Collecting and Analyzing Data

Measuring surface ozone is a new protocol, but her school has several months of data they have gathered during the initial implementation of the new protocol. She decides to identify a month that is beginning to show increased levels of ozone to begin her analysis. There is an Air Quality Monitoring site near her school, which has been turned on since March, so she accesses the ozone levels measured by the professional equipment to be sure the data she has collected are of good quality. She finds her data fall within a range of ± 10 ppb

of the professional readings. Clearly, her data are good enough for her project.

She begins by organizing a spreadsheet of her ozone measurements, ending temperature, cloud type and cover, and the starting and ending wind direction by the dates the information was recorded. See Table AT-SO-3.

She generates a plot of the ozone measurements and considers measurements of 39 ppb and lower as low ozone levels and 60 ppb and higher relatively high ozone. She then graphs the ozone and

Heart of Mary School Ozone Measurement Levels and Metadata

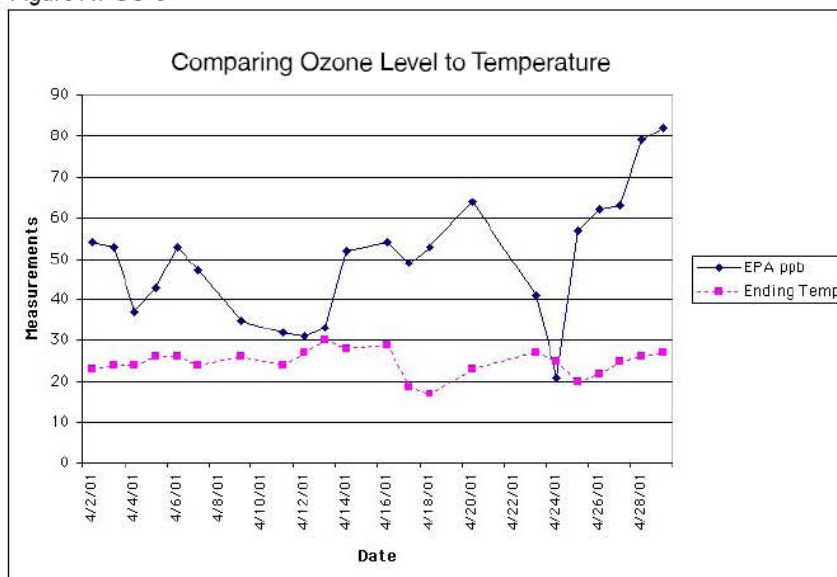
Table AT-SO-2

Taken at 17:30 UT Time

Date	ppb	Ending Temp	Cloud Type	Cloud Cover	Wind Direction (beginning/ending)
4/2/01	54	23	Cirrus	Broken	SW/SW
4/3/01	53	24	Stratocumulus	Broken	NW/NW
4/4/01	37	24	Stratocumulus	Overcast	NW/NW
4/5/01	43	26	Cirrostratus	Broken	NW/NW
4/6/01	53	26	Cirrostratus	Broken	N/N
4/7/01	47	24	Cirrostratus	Broken	NE/NE
4/9/01	35	26	Cumulus	Broken	SW/SW
4/11/01	32	24	Altostratus	Broken	SW/SW
4/12/01	31	27	Cirrus	Scattered	SW/SW
4/13/01	33	30	Alto cumulus, Cumulus	Broken	SW/SW
4/14/01	52	28	Cirrostratus, Cumulus	Broken	W/W
4/16/01	54	29	Altostratus, Cirrocumulus	Clear	NW/NW
4/17/01	49	19	None	Clear	N/N
4/18/01	53	17	None	Clear	N/N
4/20/01	64	23	None	Clear	S/SW
4/23/01	41	27	None	Clear	SW/SW
4/24/01	21	25	Cumululonimbus, Stratocumulus	Overcast	SW/SW
4/25/01	57	20	None	Clear	NW/NW
4/26/01	62	22	None	Clear	N/N
4/27/01	63	25	None	Clear	NW/NW
4/28/01	79	26	None	Clear	W/SE
4/29/01	82	27	Cirrus, Altostratus, Cirrocumulus	Broken	W/SE



Figure AT-SO-3



current temperature measurements. See Figure AT-SO-3.

While reviewing her data she realizes that there is a pattern on some days when the temperature goes up, the ozone level increases, and when it goes down the ozone level decreases. However, there are days when the temperature was equally high and the ozone level dropped dramatically. She knows her data are reasonable as she compared them with professional data, and wonders if she reorganizes her data by temperature will she be able to quickly identify the days with similar temperature that have different ozone levels. This might enable her to identify other factors influencing the level of ozone produced. See Table AT-SO-4.

She realizes that with clear conditions and an increase in temperature, the level of ozone is higher except for one day. Another observation she makes is that the presence of clouds influences the level of ozone observed regardless of the temperature, and on days with roughly the same temperature those with overcast sky conditions have lower levels of ozone. The general pattern of increasing temperatures with broken clouds still provides an increase in the level of ozone produced except for a couple of days when the temperature was high, few clouds, but the level of ozone was lower than similar days. The wind direction was different indicating that perhaps wind direction may influence the level

of ozone. The wind directions at the beginning and ending of the observation periods are usually the same during this month except the two data points taken on April 28 and 29.

Further Analysis

Students could go a step further and determine the ratio of levels of ozone days by identifying patterns of ozone levels. Students would be able to determine whether or not the number of high ozone days is increasing or decreasing each month. The categories organized to calculate ratio might be: low levels of 39 ppb or lower, 40-49 ppb, 50-59 ppb, 60-69 ppb, 70-79 ppb and 80 ppb and higher. The following sample of ozone data from March through June demonstrates how ratio may be used to analyze monthly ozone patterns. See Table AT-SO-4.

At a glance the student can visually see patterns developing from March through June and also recognize the impact of inconsistent data upon their ability to accurately analyze changes occurring over time. They might relate this to problems scientists have with incomplete data records. She will observe that there are consistently days with low levels of ozone, but she can see that the levels of ozone are increasing each month. Upon realizing that June is not a complete data summary, she might question how missing data will impact any conclusions that might be made from the review of June's data.

Table AT-SO-3 **Heart of Mary School Ozone Measurements April 2001**

Temp.	ppb ozone	Cloud Type	Cloud Cover	Wind Direction
17	53	none	Clear	N/N
19	49	none	Clear	N/N
20	57	none	Clear	NW/NW
22	62	none	Clear	N/N
23	64	none	Clear	S/SW
23	54	Cirrus	Broken	SW/SW
24	53	Stratocumulus	Broken	NW/NW
24	47	Cirrostratus	Broken	NE/NE
24	37	Stratocumulus	Overcast	NW/NW
24	32	Altostratus	Broken	SW/SW
25	63	none	Clear	NW/NW
25	21	Cumululonimbus, Stratocumulus	Overcast	SW/SW
26	79	none	Clear	W/SE
26	53	Cirrostratus	Broken	N/N
26	43	Cirrostratus	Broken	NW/NW
26	35	Cumulus	Broken	SW/SW
27	82	Cirrus, Altostratus, Cirrocumulus	Broken	W/SE
27	41	none	Clear	SW/SW
27	31	Cirrus	Scattered	SW/SW
28	52	Cirrostratus, Cumulus	Broken	W/W
29	54	Altostratus, Cirrocumulus	Clear	NW/NW
30	33	Altostratus, Cumulus	Broken	SW/SW

By reviewing the percentages for each category of ozone level, she will see the continuous increase in ozone levels and identify the general variability of ozone levels for a given period of time. See Table AT-SO-5. June's record demonstrates a void in the data, which makes it difficult to draw accurate conclusions.

Future Research

Another question raised by the student is how she might be able to identify a monthly pattern for ozone levels. She wonders if she calculates the temperature and ozone mean, for the four months, if the means will reflect a continuous increase or decrease in the level of ozone measured. Can a

monthly ozone mean calculated for each month of the year provide information about the pattern of ozone levels? How do the patterns of ozone levels relate to seasonal changes during the year?

Identifying the ozone pattern in her area will provide insight into atmospheric conditions that influence ozone levels. Exploring the relationship between wind direction patterns and levels of ozone measured provides a different challenge, but can be very exciting. Using the GLOBE database, the student may choose another school in a town located approximately at the same latitude, but in a different geographic

Heart of Mary School-Observed Ozone Levels (ppb) March through June

Table AT-SO-4

Grouped by Category (level) of Ozone Concentration

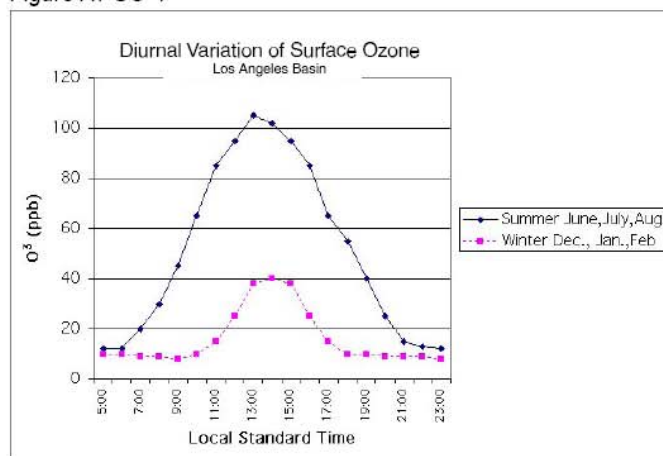
March			April			May			June		
	17		21			35			28		
	24		31			37			25		
	33		32			45			26		
	33		33			46			30		
	34		35			49			31		
	36		37			50			40		
	36		41			54			55		
	40		43			56			67		
	41		47			56			70		
	41		49			57			76		
	42		52			57			78		
	44		53			58			87		
	44		53			58			87		
	45		53			59			88		
	47		54			60			95		
	47		54			62					
	48		57			63					
	50		62			66					
	56		63			66					
	60		64			69					
	74		79			71					
	74		82			74					
						74					
						74					
						86					
Days	22		22			25			15		

Table AT-SO-5

Ratio of Ozone Levels for Four Months

Month	March		April		May		June	
Total Number of Days with Ozone Measurements	22		22		25		15	
Category	Ratio	%	Ratio	%	Ratio	%	Ratio	%
< 40 ppb	7:22	32%	6:22	27%	2:25	8%	5:15	34%
40 – 49 ppb	10:22	45%	4:22	18%	3:25	12%	1:15	7%
50 – 59 ppb	2:22	9%	7:22	32%	9:25	36%	1:15	7%
60 – 69 ppb	1:22	5%	3:22	16%	6:25	24%	1:15	7%
70 – 79 ppb	2:22	9%	1:22	5%	4:25	16%	3:15	20%
> 80 ppb	0:22	0%	1:22	5%	1:25	4%	4:15	27%

Figure AT-SO-4



region to determine what other variables might influence the level of surface ozone produced. Posing and addressing additional questions is easier when GLOBE schools consistently report data. As demonstrated in this study, missing data makes it difficult to monitor how the atmosphere changes over time.

Studying Diurnal Variation of Surface Ozone and Validation of Data

Students may also want to investigate the diurnal variation of surface ozone. A typical set of diurnal ozone is shown in Figure AT-SO-4 for the Los Angeles basin. The two curves represent summertime (dashed line) and wintertime (solid line) concentrations plotted as a function of local time. From the difference in amplitude on the two curves, it is easy to see why the data set gathered by students would likely be more interesting in the summer, late spring or early autumn rather than in the middle of winter when lower ozone concentrations and less variability would be expected.

Table AT-SO-6 summarizes two days of surface ozone measurements during times of when students would be available to take such measurements. This particular set of data was obtained at an operational EPA monitoring site so that the student measurements could be compared directly with the measurements using a calibrated ozone monitor that cost thousands of dollars. This is one comparison that has allowed GLOBE to determine how well its measurement system performs in the field.

The goal of the surface ozone protocol is to obtain ozone concentrations with an accuracy of 10 ppb or better. From the data shown in Table AT-SO-6, we can see that the accuracy goal has been achieved in this test. On both days, the Zikua system showed higher concentrations in the afternoon although the diurnal difference was much greater on the second day. The EPA monitor confirmed the diurnal behavior and also measured a greater difference between the afternoon and morning of the 30th.

Table AT-SO-6

Date	Start Time	GLOBE Reading (ppb)	EPA Reading (ppb)
8/29/00	10:00	22	25
	12:00	28	31
	13:00	33	35
	14:00	31	39
	15:00	34	44
8/30/00	10:00	18	10
	11:00	23	25
	12:00	29	31
	13:00	35	38
	14:00	43	53
	15:00	60	59

Appendix N

Actions for Air Quality Action Days
Local Government and State Memorandums

MEMORANDUM

TO: Gloria Puffinburger, Frederick County Clean Air Coordinator

FROM: John R. Riley, Jr., County Administrator

SUBJECT: Air Quality Action Day Procedures

DATE: June 5, 2006

The 2006 Ozone Season began May 1st and lasts through September 30th. As part of an Early Action Compact area, please ensure that County employees implement the measures listed below to reduce the emissions of air pollutants. These measures are to be implemented on “Air Quality Action Days”. The Virginia Department of Environmental Quality (VDEQ) designates an “Air Quality Action Day” when ground level ozone is predicted to be at high and unhealthy levels.

Winchester-Frederick County Actions on Air Quality Action Days:

1. *Postpone Mowing* – Postpone the use of gasoline and diesel-powered mowers, weed eaters, and other similar gasoline engines.
2. *Postpone Painting* – Postpone the use of oil based paints and solvents.
3. *Restrict Engine Idling* – Restrict idling of gasoline powered, publicly-owned vehicles.
4. *Restrict Burning* – Restrict burning associated with any County land clearing and construction projects.
5. *Safety Measures* – Limit prolonged outdoor exertion.

Valley AirNow will notify you by e-mail of a pending “Air Quality Action Day”. This notice will be provided the day before the VDEQ predicts an “Air Quality Action Day”. Please forward this memorandum to your roster of County employees and encourage them to take these precautionary actions.

JRR/cih



COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION

1401 EAST BROAD STREET
RICHMOND, VIRGINIA 23219-2000
VirginiaDOT.org

GREGORY A. WHIRLEY
ACTING COMMISSIONER

April 12, 2006

MEMORANDUM

TO: Thomas A. Hawthorne, P.E.
Mr. David E. Ogle
Dennis Heuer, P.E.
Richard L. Caywood, P.E.
Garrett Moore, P.E.
Mr. Dennis Morrison

FROM: Gregory A. Whirley 

SUBJECT: Ozone Alert Procedures

The 2006 ozone season begins **May 1**. As part of either an air quality nonattainment, maintenance, or early action compact area, will you please ensure that your District implements the below measures to reduce the emissions of air pollutants. These measures are to be implemented on "Air Quality Action Days". The Virginia Department of Environmental Quality (VDEQ) designates an "Air Quality Action Day" when air quality is predicted to be at high and unhealthy levels.

VDOT Actions on Air Quality Action Days:

1. *Reduce Travel* – Minimize travel to the extent possible, use transit, participate in ridesharing and encourage teleconferencing.
2. *Postpone Mowing* – Postpone the use of gasoline and diesel powered mowers, weed eaters and other similar gasoline engines.
3. *Restrict Fueling* – VDOT gasoline facilities will be locked from 8:30 a.m. to 5:00 p.m.
4. *Variable Message Signs* – If variable message signs are not needed for emergency purposes, then they should alert the public of the "Air Quality Action Day". The following verbiage is suggested: "Air Quality Action Day: Reduce travel, carpool, refuel after 5 pm".
5. *Reduce Electricity Usage* – Dim or turn off unnecessary lights, turn off supplemental appliances and maintain air conditioning at reasonable temperatures at VDOT facilities (74° or above).
6. *Postpone Painting* – Postpone use of oil based paints and solvents.



7. *Safety Measures* – Limit prolonged outdoor exertion.

Our Emergency Operations Center will notify you by e-mail of pending “Air Quality Action Day”. This notice will be provided the day before the VDEQ predicts an “Air Quality Action Day”. Please forward this memorandum to your staff and encourage them to take these precautionary actions. If you or your staff has any question regarding the above measures, please contact Jim Ponticello at 804-371-6769.

Attachment

cc: Mr. Jim Ponticello

Virginia Ozone Nonattainment, Maintenance, and Early Action Compact Areas

Ozone Nonattainment Area: An area that exceeds the Environmental Protection Agency's National Ambient Air Quality Standards (NAAQS) for ozone.

Ozone Maintenance Area: An area that that has previously exceeded the Environmental Protection Agency's National Ambient Air Quality Standards (NAAQS) for ozone, but has come back into compliance and has adopted a maintenance plan.

Ozone Early Action Compact Area: An area that exceeds the EPA's NAAQS, but the effective date of its ozone nonattainment area designation has been deferred, because of proactive efforts within the region to reduce emissions.

Table 1. Counties by VDOT Districts that are located either in ozone nonattainment, maintenance, or early action compact areas.

	DISTRICT					
	Northern Virginia	Fredericksburg	Staunton	Hampton Roads	Richmond	Salem
JURISDICTION	Alexandria Arlington Fairfax (County & City) Falls Church Loudoun Manassas Manassas Park Prince William	Fredericksburg Spotsylvania Stafford Gloucester	Frederick* Winchester*	Chesapeake Hampton Isle of Wight James City Newport News Norfolk Poquoson Portsmouth Suffolk Virginia Beach Williamsburg York	Charles City Chesterfield Colonial Heights Hanover Henrico Hopewell Petersburg Prince George Richmond	Botetourt* Roanoke (County & City)* Salem* Vinton*

* 8-hour ozone Early Action Compact Area



COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
1401 EAST BROAD STREET
RICHMOND, VIRGINIA 23219-2000
VirginiaDOT.org

GREGORY A. WHIRLEY
ACTING COMMISSIONER

April 17, 2006

TO: Agency Transportation Officers

FROM: Richard L. Walton, Jr. *Richard L. Walton/JRW*
Chief of Policy, Planning and the Environment

SUBJECT: The Gas Restrictions for
"Air Quality Action Days"
Vehicle Fueling Hours at VDOT Facilities

Gasoline pumps operated by the Virginia Department of Transportation (VDOT) in air quality non-attainment, maintenance, and early action compact areas that do not have vapor recovery systems will be closed from 8:30 a.m. to 5:00 p.m. on "Air Quality Action Days". The Virginia Department of Environmental Quality (VDEQ) designates an "Air Quality Action Day" when air quality is predicted to be at high and unhealthy levels. This measure that VDOT has implemented since 1996 is intended to reduce the emissions of air pollutants from VDOT facilities and to improve the air quality for the citizens of the Commonwealth.

A list of counties in air quality non-attainment, maintenance, and early action compact areas is attached. Travelers needing to re-fuel gasoline powered state vehicles in these counties on "Air Quality Action Days" must use VDOT fueling facilities before 8:30 a.m., or make other re-fueling arrangements. The Virginia Department of Environmental Quality forecasts ozone "Air Quality Action Days" and alerts the news media and the public. Please encourage state vehicle users to monitor summer weather forecasts and the news, to ensure that they are not inconvenienced by this pollution reduction measure.

The dissemination of this information to your employees will be appreciated.

Attachment



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JURISDICTION	Alexandria Arlington Fairfax (County & City) Falls Church Loudoun Manassas Manassas Park Prince William	Fredericksburg Spotsylvania Stafford Gloucester	Frederick* Winchester*	Chesapeake Hampton Isle of Wight James City Newport News Norfolk Poquoson Portsmouth Suffolk Virginia Beach Williamsburg York	Charles City Chesterfield Colonial Heights Hanover Henrico Hopewell Petersburg Prince George Richmond	Botetourt* Roanoke (County & City)* Salem* Vinton*

* 8-hour ozone Early Action Compact Area

Appendix O

June to December 2006 Activities to Enhance/Expand
Existing Northern Shenandoah Valley Regional
Commission Ridesharing Program

NORTHERN SHENANDOAH VALLEY REGIONAL COMMISSION VALLEY COMMUTER ASSISTANCE PROGRAM

Activities Update (June – November, 2006)

The Northern Shenandoah Valley Regional Commission, operating through its Valley Commuter Assistance Program, continued to work on a number of activities to promote ridesharing and improve air quality in the 5-county region since June 2006. The following list is a summary of these activities:

Ridesharing

- Created three (3) new vanpools, with 10-13 passengers each
- Continued to support the private commuter bus service to Washington, DC on the I-66 Corridor. This service is currently carrying approximately 22 passengers. Staff is also working on the possibility of establishing a second Washington, DC commuter bus that would operate on a later time schedule than the current service.
- Continued to support the private commuter bus service to the Westfields Business Park in Fairfax County. Current ridership is 37 passengers.
- Created a third new commuter bus to provide service to the CIA Central Office in Fairfax County outside of McLean, VA. This service is carrying approximately 32 passengers.
- Staff is currently working on a demonstration grant to be filed with the Virginia Department of Rail & Public Transportation in February 2007 to run shuttle service from the Northern Shenandoah Valley to the Vienna Metro Station in Fairfax County. The proposed service would operate up to four (4) morning and afternoon runs shuttling passengers between park and ride lots in the Northern Shenandoah Valley and the Vienna Metro Station.

Employer Outreach

- Staff is continuing to work with employers in the Westfields Business Park in Chantilly, VA to determine enough demand exists to start a second commuter bus.

Media Advertising/Public Outreach

- Valley Commuter Assistance Program will be running a media campaign on Adelphia Cable TV during the late Fall and Winter months. A series of crawl ads will play on the Weather Channel early mornings and evenings on

weekdays promoting the commuter bus service and outlining the benefits of ridesharing. Phone numbers and website links to obtain additional information will also be provided.

- Staff has developed an electronic newsletter that is distributed to all persons registered with the Valley Commuter Assistance on a periodic basis. This newsletter provides commuters with information on where to get updated VDOT highway construction alerts, openings in existing carpools and vanpools, details on commuter bus operations, and other valuable information.
- Valley Commuter Assistance Program sponsored a series of radio safety messages for back to school in September on WFTR FM 93.5 urging drivers to be safe and to contact the ridesharing program for additional information.
- Valley Commuter Assistance Program has reached an agreement with S&W Tours, the company operating the Washington, DC commuter bus service, to place a large sign advertising the commuter assistance program on both sides of the bus. The commuter assistance program is also negotiating with S&W Tours to provide bus advertising signs on other two commuter buses that they are currently operating.

Coordination Meetings

- Staff attended the Virginia TDM/Ridesharing Conference held on June 6-8, 2006 in Chincoteague, VA to exchange information and ideas with other programs in the state.
- Staff attended the Association for Commuter Transportation (ACT) International Conference held on August 27-30, 2006 in Boston, MA to exchange information and ideas with other programs in the country. Staff also made a presentation on how a survey was used to create additional programs and services in the Northern Shenandoah Valley.

Park and Ride Lots

- Staff is continuing to work with VDOT, Clarke County, and the Town of Berryville to explore available options for locating a new park and ride lot within the town.
- Staff is working with VDOT and Warren County to find ways to increase park and ride lot capacity at the Front Royal and Linden park and ride lots. Currently these lots are operating at 100% capacity and additional spaces are needed.
- Staff presented testimony at the VDOT 6-Year Statewide Transportation Improvement Program public hearing held in Verona, VA on October 26, 2006 requesting the Commonwealth Transportation Board to dedicate

additional resources to new park and ride lot construction and the expansion of existing lots in the Northern Shenandoah Valley region.

Rideshare Matching Services

- Between June and November, 2006, staff received and responded to 125 new matching requests for carpools, vanpools, and commuter bus service and information requests and 70 renewal requests from existing persons already signed up for the program.

NORTHERN SHENANDOAH VALLEY REGIONAL COMMISSION WINCHESTER-FREDERICK COUNTY (“WIN-FRED”) METROPOLITAN PLANNING ORGANIZATION (MPO)

Activities Update (June – November, 2006)

The Northern Shenandoah Valley Regional Commission, serving as the staff for the Win-Fred MPO, worked on several projects for the MPO that will improve air quality and provide other benefits to the region during this report period. The following list is a summary of the activities:

U.S. Route 11 Corridor Access Management Study

Staff and the Virginia Department of Transportation (VDOT) are currently studying the U.S Route 11 Corridor from Bellview Ave. in the City of Winchester to south of the Town of Stephens City (approximately 8 miles). The purpose of the study is to identify proposed improvements, policies, and regulations that will reduce congestion, manage access to adjacent properties safely and efficiently, and increase capacity of the roadway. The study is anticipated to be completed in August 2007.

U.S. Route 11/Rt. 37/Shady Elm Drive Interchange Study

Staff, VDOT, and HNTB, a private consulting firm from Arlington, VA, are currently studying a complex interchange configuration located adjacent to Exit 310 of I-81. Due to adjacent private development in the area, congestion, accidents, and other traffic problems have increased significantly. The purpose of the study is to identify proposed improvements, policies, and regulations that will reduce congestion, manage access to adjacent properties safely and efficiently, and increase capacity of the roadway. The study is anticipated to be completed in August 2007.

MPO Bicycle and Pedestrian Mobility Plan

Staff and Toole Design Group, a private consulting firm from College Park, MD, are currently working on a plan to provide a connected and comprehensive network of bicycle and pedestrian facilities in the MPO study area (Winchester-Frederick County Urbanized Area). The goals of the plan are to provide new facilities that will create logical connections to existing facilities, enhance recreational opportunities, improve access to schools, libraries, and other public facilities, and provide an alternative to using a personal automobile. The study is anticipated to be completed in the spring of 2007.

The Key Newsletter

Vol. 1, Issue 2, Dec. 2006



Be in the know when you go..

In this issue of "The Key Newsletter" we are focusing on the Guaranteed Ride Home Program and Metrocheks. We have had several of our commuters ask "What do I do if I have an emergency at work and have to get home, but I'm in a carpool?". This issue will answer that question and many others that you may have. We have also explained the Metrochek program and provided a link for any additional questions you may have.

Interested to know what your commute is REALLY costing you? We have provided a link under the header "Cost of Commuting".

Highway Information Links

The following links will have current information regarding lane closures on the Interstates you use on your commute.

[I-66](#)

[Route 7](#)

[Route 50](#)

[Northern Virginia Commuter Resources](#)

Commuter Buspool Information

The monthly rate for the Commuter Bus to the DC area has been reduced to \$300 a month effective December 1, 2006. The monthly rate reduction allows monthly riders to ride for as low as \$14.00 a day. Please click on the link below for addtl information.

[Commuter Buspool](#)

To remove your name from our mailing list, please [click here](#).

Questions or comments? E-mail us at rideinfo@shentel.net or call (540)-635-4146.

If you would like to share any of your commuter stories or add helpful information for our newsletter, please email us.

Member of
COMMUTER CONNECTIONS
 1-800-745-Ride



What is Guaranteed Ride Home Program (GRH)?

The Guaranteed Ride Home Program provides commuters who carpool, vanpool, or take public transit to work with a ride home when unexpected emergencies arise. Commuters who register with the Program will be able to use GRH to get home for unexpected personal emergencies and unscheduled overtime—**up to FOUR times per year**. Best of all, the GRH ride home by taxi, rental car, bus or train is **FREE!**

How Do I sign up?

The GRH Program is administered by Commuter Connections. Call them at 1-800-745-RIDE for more information, or apply online at [GRH Application](#).

What is Metrochek?

[Metrochek's](#) voucher program is an employee benefit provided by more than 2500 public and private employers in the Washington, D.C. metropolitan area. Metrocheks are accepted by more than 100 bus, rail, and vanpool commuters services in the region, including Metro, MARC, VRE, local bus systems, and **registered vanpools**. Metrocheks can be used as Metrorail farecards or as vouchers when purchasing fares for other transit services.

Cost of Commuting

Are you interested in knowing what commuting is costing you? Click on this link: [Calculate Your Cost of Commuting](#).

Happy Holidays from the Staff at the Valley Commuter Assistance Program



Appendix P

Win-Fred Metropolitan Planning Organization (MPO)
Bicycle & Pedestrian Accommodations

Questionnaire for the WinFred MPO Bicycle & Pedestrian Mobility Plan

Welcome!

Thank you for your interest in walking and bicycling in Frederick County, the City of Winchester, and the Town of Stephens City, Virginia. Your responses to this questionnaire will provide information that will aid in the development of the WinFred MPO Bicycle & Pedestrian Mobility Plan. The Plan will result in the implementation of projects to improve conditions for walking and bicycling within the WinFred MPO. Even if you don't walk or bike regularly, we would appreciate your feedback. Your responses to this questionnaire will be anonymous. At the end of the questionnaire, you will be invited to provide your e-mail address if you would like to receive updates on the Plan, including the schedule for public meetings.

This short questionnaire includes three parts: 1) pedestrian questions, 2) bicycle questions, and 3) background information questions.

Pedestrian Section

1. On average, how often do you walk (or use an assistive device, such as a wheelchair) for the following purposes?

	Never/Not applicable	Less than a few times per month	A few times per month	A few times per week	Five or more times a week
To work	☐	☐	☐	☐	☐
To shopping or errands	☐	☐	☐	☐	☐
To school	☐	☐	☐	☐	☐
To social/recreational activities	☐	☐	☐	☐	☐
For exercise (no destination)	☐	☐	☐	☐	☐
Other	☐	☐	☐	☐	☐

2. Is there a sidewalk or trail near your home?

- ☐ Yes
- ☐ No

3. Do you walk on the sidewalk or trail near your home?

- ☐ Yes
- ☐ No

4. If there was a sidewalk or trail near your home would you walk on it?

- ☐ Yes
- ☐ No

5. Which of the following prevent you from walking in Frederick County, the City of Winchester,

or the Town of Stephens City? (Choose top 3)

- ☐ Travel time (takes too long to reach destinations)
- ☐ Lack of sidewalks
- ☐ Lack of greenway paths/trails
- ☐ Poor sidewalk quality
- ☐ High-speed traffic
- ☐ Heavy traffic
- ☐ Dangerous/difficult road crossings
- ☐ Inadequate lighting (along roadways or at roadway crossings)
- ☐ Personal security (concerned about crime)
- ☐ Other travel modes are safer or more comfortable
- ☐ Physical ability
- ☐ Hills
- ☐ Weather
- ☐ Other (please specify)

6. Which of the following changes would encourage you to walk more often in Frederick County, the City of Winchester, or the Town of Stephens City? (Choose top 3)

- ☐ More destinations within walking distance
- ☐ More sidewalks
- ☐ More paved roadway shoulder areas
- ☐ More greenways/off-road trails
- ☐ Better marked/painted crosswalks
- ☐ New pedestrian countdown signals (signals that count down the time left to finish crossing the street)
- ☐ Narrower roadway crossings (e.g., provide median islands, curb extensions, and/or build narrower roadways)
- ☐ More education on pedestrian safety
- ☐ Reduced speeding and increase in drivers yielding to pedestrians in crosswalks
- ☐ Other (please specify)

7. On which roads would you like to see pedestrian improvements, such as sidewalks or better crosswalks/signals (please answer regardless of whether or not you are a pedestrian)? Please be as specific as possible. List the road name and a starting and ending intersection. Feel free to provide additional locations in the comment box at the end of this questionnaire.Location #1: Location #2: Location #3: **8. How do you feel drivers typically behave around pedestrians in Frederick County, the City of**

Winchester, or the Town of Stephens City? Please check all that apply.

- ☐ Drivers are courteous— they drive slowly when pedestrians are nearby and yield to pedestrians crossing roadways
- ☐ Drivers drive too fast
- ☐ Drivers do not yield to pedestrians crossing roadways
- ☐ Drivers pass pedestrians walking on the side of the road too closely
- ☐ Drivers harass pedestrians
- ☐ I do not walk often enough to answer this question
- ☐ Other (please specify)

9. To which destinations would you like to be able to walk (List destinations to which are currently unable or unwilling to walk)?Location #1: Location #2: Location #3: **10. Which aspect of walking is most appealing to you? (Please choose one)**

- ☐ Improving health and fitness
- ☐ Less time in the car
- ☐ More convenient than other travel modes
- ☐ Money saved on fuel
- ☐ More time outdoors
- ☐ Social Interaction
- ☐ Environmentally responsible
- ☐ Other (please specify)

11. Should public funds be used to improve pedestrian transportation options?

- ☐ Yes
- ☐ No

12. Which types of funds should be the primary funds used to improve pedestrian transportation options?

- ☐ Existing local taxes
- ☐ New local taxes
- ☐ State and federal grants
- ☐ Other (please specify)

Bicycle Section

13. How many bicycles do you have in your household?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 or more

14. Is there a bicycle trail or signed bicycle route near your home?

- ☐ Yes
- ☐ No

15. Do you ride on the bicycle trail or signed bicycle route near your home?

- ☐ Yes
- ☐ No

16. If there was a bicycle trail or signed bicycle route near your home, would you ride on it?

- ☐ Yes
- ☐ No

17. On average, how often do you bicycle for the following purposes?

	Never/Not applicable	Less than a few times per month	A few times per month	A few times per week	Five or more times a week
To work	☐	☐	☐	☐	☐
To shopping or errands	☐	☐	☐	☐	☐
To school	☐	☐	☐	☐	☐
To social/recreational activities	☐	☐	☐	☐	☐
For exercise (no destination)	☐	☐	☐	☐	☐
Other	☐	☐	☐	☐	☐

**18. Which of the following factors prevent you from bicycling or from bicycling more often?
(Choose top 3)**

- ☐ Travel time (takes too long to reach destinations)
- ☐ Lack of bicycle facilities (such as bike lanes, wide travel lanes, paved shoulders, greenway trails, etc.)
- ☐ Weather
- ☐ High-speed traffic
- ☐ Physical ability
- ☐ Narrow roads
- ☐ Heavy traffic

- ☐ Personal security (concerned about crime)
- ☐ Other travel modes are safer or more comfortable
- ☐ Hills
- ☐ Pavement quality
- ☐ Loose gravel/debris

- ☐ Dangerous/difficult road crossings
- ☐ Poor lighting (along roadways or at roadway crossings)
- ☐ Other (please specify)

19. Which of the following changes would encourage you to bike more often? (Choose top 3)

- ☐ More destinations within bicycling distance
- ☐ Increased enforcement of laws applying to motorists
- ☐ Narrower roadway crossings (e.g., provide median islands, curb extensions, and/or build narrower roadways)
- ☐ More bicycle facilities (such as bike lanes, wide travel lanes, paved shoulders, greenway trails, etc.)
- ☐ More organized bicycle rides for families and new bicyclists
- ☐ Greater availability of showers/changing facilities
- ☐ Bicycle route signs
- ☐ Increased enforcement of laws applying to bicyclists
- ☐ A map of bicycle routes
- ☐ More safety education programs and events for new cyclists
- ☐ More bike parking (such as bike racks or lockers at schools, parks, shopping areas, park and ride lots, offices, etc.)
- ☐ Other (please specify)

20. Which types of bicycle facilities do you prefer to ride on? (Choose top 3)

- ☐ Paved shoulders
- ☐ Greenways/off-road trails
- ☐ Vehicle travel lanes (sharing travel lanes with motor vehicle traffic)
- ☐ Designated bicycle lanes
- ☐ Wide vehicle travel lanes (wide curb lanes) (outside lanes with enough space for motor vehicles to pass bicyclists on left side in the same lane)
- ☐ Other (please specify)

21. On which roads would you like to see bicycle improvements, such as bicycle lanes, trails, paved shoulders, or safer roadway crossings (regardless of whether or not you are a bicyclist)? Please be as specific as possible. List the road name and a starting and ending intersection. Feel free to provide additional locations in the comment box at the end of this questionnaire.

Road #1:

Road #2:

Road #3:

22. If you bicycle, how do feel drivers typically behave around bicyclists in Frederick County, the City of Winchester, or the Town of Stephens City? Please check all that apply.

- ☐ Drivers are courteous—they yield and give bicyclists space
- ☐ Drivers drive too fast
- ☐ Drivers pass bicyclists too closely
- ☐ Drivers harass bicyclists
- ☐ Drivers do not yield to bicyclists crossing roadways
- ☐ I do not bicycle often enough to answer this question
- ☐ Other (please specify)

23. To which destinations would you like to be able to ride a bicycle (List destinations to which you currently are unable or unwilling to ride)?

Destination #1:

Destination #2:

Destination #3:

24. Which aspect of bicycling is most appealing to you? (Please choose one)

- ☐ Improving health and fitness
- ☐ Less time in the car
- ☐ More convenient than other travel modes
- ☐ Money saved on fuel
- ☐ More time outdoors
- ☐ Social interaction
- ☐ Environmentally responsible
- ☐ Other (please specify)

25. Should public funds be used to improve bicycle transportation options?

- ☐ Yes
- ☐ No

26. Which types of funds should be the primary funds used to improve bicycle transportation options?

- ☐ Existing local taxes
- ☐ New local taxes
- ☐ State and federal grants
- ☐ Other (please specify)

Background Information

27. What is your age?

- ☐ 0 - 9
- ☐ 10 - 19
- ☐ 20 - 29
- ☐ 30 - 39
- ☐ 40 - 49
- ☐ 50 - 59
- ☐ 60 and older

28. What is your gender?

- ☐ Male
- ☐ Female

29. How many people live in your household?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 or more

30. How long have you lived in Frederick County, the City of Winchester, or the Town of Stephens City?

- ☐ Less than 1 year
- ☐ 1 to 2 years
- ☐ 3 to 5 years
- ☐ 6 to 10 years
- ☐ More than 10 years

31. What is your zip code?

- ☐ 22601
- ☐ 22602
- ☐ 22603
- ☐ 22624
- ☐ 22625
- ☐ 22637
- ☐ 22638
- ☐ 22645
- ☐ 22654
- ☐ 22655

- ☐ 22656
- ☐ 22663
- ☐ Other (please specify)

32. In what neighborhood or subdivision do you live?

Your Questionnaire is Complete

Thank you for completing this Questionnaire for the WinFred MPO Bicycle & Pedestrian Mobility Plan.

For more information about this questionnaire, please e-mail Steve Kerr, Executive Director of the Northern Shenandoah Valley Regional Commission at skerr@shentel.net

33. If you are interested in receiving updates on the WinFred MPO Bicycle & Pedestrian Mobility Plan, such as a schedule of public meetings, please provide your e-mail address in the box below.

34. Please provide additional comments in the box below:

2030 Transportation Plan Materials



This plan has been prepared by the Win-Fred MPO and its member jurisdictions (Frederick County, the City of Winchester, and the Town of Stephens City) in cooperation with the Virginia Department of Transportation (VDOT), the Virginia Department of Rail and Public Transportation (VDOT), the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA). This report does not constitute a standard, specification, or regulation, nor does it provide a funding mechanism for the included transportation recommendations. Additional project-level environmental impact assessments and/or studies of alternatives may be necessary.

MPO RESPONSIBILITY

The 2008 US Census was completed. The Winchester region was classified as a metropolitan area and the primary responsibility for regional transportation planning was assigned to the local region, under the auspices of an organization called a Metropolitan Planning Organization (MPO). The Win-Fred MPO area includes the City of Winchester, the Town of Stephens City, and the urbanized portions of Frederick County.

COMPONENTS OF 2030 TRANSPORTATION PLAN

The Winchester-Frederick County Metropolitan Planning Organization (Win-Fred MPO) 2030 Transportation Plan is a multi-modal transportation plan that addresses existing and future transportation needs of the Win-Fred MPO area. The plan includes the evaluation of existing transportation conditions and the development of a fiscally-unconstrained Vision Plan, as well as a fiscally-constrained Long-Range Plan (LRP). The plan has a fiscally-constrained component per federal requirements – it consists of those projects for which funding are projected to be available between 2011 and 2030.

The 2030 Transportation Vision Plan and CLRP focus on future transportation investments. This does not include current transportation financial commitments for the region, which are included in the MPO's Transportation Improvement Plan (TIP) and VDOT's Six-Year Plan. These projects have been considered in the analysis of future transportation conditions, but they are not components in the Vision Plan or CLRP, unless the projects are partially funded in the Six-Year Plan. The VDOT Six-Year Plan is updated annually; future Six-Year Plan projects will be selected only from the MPO's CLRP. The MPO can update/modify their Transportation Plan at any time to alter the CLRP as needed.

DEMOGRAPHIC OVERVIEW

The Winchester metropolitan region grew substantially in the 1990s, leading to the area's designation as an MPO. Current population and employment forecast for 2030 forecast a continuation of this growth. The MPO area population was forecasted to 2030 based primarily on city and county-level population projections prepared by the Virginia Employment Commission (VEC). Employment growth was forecasted to 2030 based primarily on statewide employment forecasts from the VITRANS 2025 Statewide Multimodal Transportation Plan. Both population and employment were adjusted based on local input on land use plans, comprehensive plans, and ongoing and potential development in the region. Overall, between 2003 and 2030, the MPO area is projected to experience a 65 percent increase in population and a 49 percent increase in employment.

Area	2003 Employment	2010 Employment	% Change
City of Winchester	26,600	35,260	40%
Frederick County – MPO Portion	17,247	26,002	51%
Total MPO	43,847	61,262	40%
Frederick County – Non-MPO Portion	3,400	5,700	70%
Winchester and Frederick County Totals	47,247	71,044	50%

PUBLIC INVOLVEMENT

The public involvement activities for the 2030 Transportation Plan were conducted in conformance with the requirements of the MPO's Public Involvement Plan (PIP). The following activities were conducted to obtain public input on transportation needs for the 2030 Transportation Plan:

- A public-bid meeting was held on February 12, 2004 to introduce the 2030 Transportation Plan processes and gather input on transportation needs.
- Outreach meetings were held on five occasions between February 2004 and July 2004 to elicit input from low-income, minority, and travel-dependent populations.
- A public information meeting was held on October 28, 2004 to present existing and future transportation needs.
- A public information meeting was held on April 14, 2005 to present the Vision Plan.
- The draft 2030 Transportation Plan was released for public review and comment from July 22 through September 6, 2005. The draft plan was available for review and downloading on the Win-Fred MPO website (www.winfredmpo.org) throughout the public comment period.
- The MPO Policy Committee conducted a formal public hearing on Monday, August 22, 2005.
- Public presentations were given between August 23 and September 8, 2005 on the draft 2030 Transportation Plan at regular meetings of the Winchester City Council, the Town of Stephens City Town Council, the Frederick County Board of Supervisors, and at a transportation forum of the Community Consensus Coalition.

In addition, the Win-Fred MPO has evaluated federal environmental justice requirements and has found the 2030 Transportation Plan to be supportive and non-discriminatory to the region's minority populations and low-income populations.

VISION PLAN

A Vision Plan is extremely important in guiding future growth within the MPO area. The Vision Plan is the "blueprint" of locally-desired transportation improvements that address both existing and long-range (2030) transportation needs. The Vision Plan is a needs-based plan, and therefore it is fiscally unconstrained. The Vision Plan portion of the 2030 Transportation Plan is shown in blue on the plan provided on the reverse side of this page. The Vision Plan includes a combination of roadway improvements, new roadways, interchange or intersection improvements, bicycle and pedestrian improvements, transit improvements, and congestion management strategies. More detail on the 2030 Vision Plan is provided in the 2030 Transportation Plan document, which is available online at www.winfredmpo.org.

The Vision Plan was developed by the MPO with the following inputs:

- Review of Existing Transportation Congestion
- Review of past regional planning efforts (Winchester Area Transportation Study)
- Coordination with state and regional planning design efforts
- Review of ongoing comprehensive planning activities of the three member jurisdictions
- Projection of future transportation congestion
- Identification and evaluation of potential future transportation improvements

Roadway Improvements

The 2030 Vision Plan identifies approximately 100 future roadway, intersection, or interchange improvements within the MPO area to address existing and projected 2030 commuter peak-hour traffic congestion. Of these projects, however, projected federal, state and local transportation funding for new roadway construction projects will only cover approximately three percent of the estimated cost of Vision Plan roadway projects. These projects cover a wide range of potential roadway investments, from improvements to existing roads, construction of new roadways, intersection improvements, and construction of new interchanges.

Public Transit

The City of Winchester owns and operates a public transit system called Winchester Transit (WinTran). This bus system operates both fixed route and paratransit service within the city. The fixed route service includes local, express, shopping and commercial developments, medical facilities and the downtown core of the city. The service primarily operates within the City of Winchester; however, some routes extend out into Frederick County. Two new routes, which started service in December 2004, are currently being run into the county on a one-year, federally-funded trial basis.

Bicycle and Pedestrians

The 2030 Transportation Plan includes an overview of the existing regional bicycle plan, a bike and trails plan by the Town of Stephens City, and a current effort by the City of Winchester to mitigate existing sidewalk deficiencies. Bicycle and pedestrian issues also received considerable public comment throughout the course of the development of this plan. The Win-Fred MPO is currently planning for the preparation of a MPO bicycle and pedestrian plan that will build on the recommendations of the regional bike plan, consider the public comments received to-date, and help to provide an MPO framework for the continued development and integration of bicycle and pedestrian accommodations on MPO area roadways.

Ride-sharing

Ride-sharing is currently facilitated by Valley Connector Assistance Program (VCAP). VCAP is a service provided by the Northern Shenandoah Valley Regional Council that provides commuter information and ride-share assistance for residents and businesses located in the City of Winchester and Clarke, Frederick, Pike, Shenandoah and Warren Counties.

In addition, the Northern Shenandoah Valley Public Mobility Program (NSVMP) is an ongoing effort to create a coordinated human services transportation system for the Northern Shenandoah Valley region of Virginia using advanced intelligent transportation systems technology. The goal is to integrate existing human service providers with existing transit service (Winchester Transit) using technology to provide a seamless transportation support system. The NSVMP is currently developing the necessary infrastructure and systems to provide:

- Networked Computer Aided Dispatching
- Automatic Vehicle Location
- Medical Electronic Payment

CONSTRAINED LONG-RANGE PLAN (CLRP)

A Constrained Long-Range Plan (CLRP) is required by federal regulations in an MPO area in order to ensure that a fiscally-responsible plan is in place. The CLRP presents a 20-year projection of funds that are either already available or for the longer term are reasonably expected for all of the projects in such plans. The CLRP must also include adequate funds for maintenance of the existing transportation system and consideration of a multimodal transportation network. Whereas the Vision Plan is the "wish list," the CLRP is the implementation list. No projects can be included in an MPO's Transportation Improvement Plan (TIP) and the State's Six-Year Plan (SLYP) unless the project is included in the approved CLRP.

The MPO has identified funding commitments for specific construction/design projects to implement between 2005 and 2030. The CLRP projects are presented in the surrounding tables. These projects are also illustrated in orange on the plan map provided on the reverse side of this page. The location of projects shown on the map is a general indication of improvements and/or connections that are proposed. Final alignments of any roadway improvements will be determined in the future during engineering and location studies. The surrounding tables describe each CLRP project, indicating location, proposed action, programming level, project cost, and CLRP funding commitment.

Interstate CLRP Projects

Route	Facility Name	Project Limits	Recommendation	Length (miles)	Proposed Typical Cross Section	Program Level	Estimated Construction Cost (\$1,000,000)	CLRP Allocation (\$1,000,000)
I-66	Interchange #1	US 301 to MP 315	Widen to 6 lanes	5	RAO	FE	\$2,024	\$2,024
I-66	Interchange #1	MP 315 to MP 318	Controlled partial interchange/diverging roads (3 lanes each)	3	ABO	FE	\$36,707	\$36,707
I-66	Interchange #1	MP 318 to north MPO boundary	Widen to 6 lanes	11	RAO	FE	\$59,765	\$59,765
I-66	Interchange #1	Exit 107 (Route 277)	Rebuild existing interchange to south			FE	\$99,300	\$99,300
I-66	Interchange #1	Exit 210 (Route 17)	Improve interchange			FE	\$80,600	\$80,600
I-66	Interchange #1	MP 311 (State Drive)	Controlled new interchange			FE	\$109,395	\$109,395
I-66	Interchange #1	MP 313 (Route 17)	Improve interchange			FE	\$109,250	\$109,250
I-66	Interchange #1	Exit 215 (Route 7)	Improve interchange			FE	\$49,875	\$49,875
I-66	Interchange #1	Exit 217 (US Route 11)	Improve interchange			FE	\$57,500	\$57,500
I-66	Interchange #1	MP 315 (Way)	Controlled new interchange with Roundabout			FE	\$26,140	\$26,140
I-66	Interchange #1	Exit 221 (Route 672)	Rebuild existing interchange			FE	\$9,232	\$9,232
I-66	Interchange #1	Exit 223 (Route 680)	Turn Lane Improvements			FE		
Total							\$603,086	\$603,086

Note: Program Level = FE = Preliminary Engineering, RA=Right-of-Way

Park and Ride Facilities

There are currently no park and ride facilities in the Win-Fred MPO area. However, there are park and ride lots located near the MPO boundaries at the following locations:

- Double Tollgate (US Route 522/340 just south of Route 277)
- Waterloo (US Route 50 at US Route 340)
- Four Royal (66 at US Route 522/340)
- Linden (near I-66)
- Shenandoah (near I-66)

The 2030 Vision Plan includes the development of two future park and ride facilities within the MPO area at:

- US Route 522 near Tuller Road (Route 642)
- Route 7 between I-66 and the Clarke County line

Freight Rail

Freight rail service is provided in much of the study area by two railroads, the Winchester & Western railroad and CSX railroad. These railroads provide freight rail service to many of the older industrial areas in Winchester and Frederick County. Within the Win-Fred MPO there are 49 at-grade rail crossings, and these crossings pose potential conflicts between freight rail and area drivers, pedestrians and bicyclists.

Airport

The Win-Fred MPO is served by the Winchester Regional Airport, which is located in Frederick County on Airport Road (west of the City of Winchester on US Route 17/50). This regional airport is a general aviation airport and is not certified to handle commercial aircraft. With expansion in aircraft storage hangars and upgrades to the existing weather reporting systems, the Winchester Regional Airport is projected to continue to serve general aviation needs and adequately support the continued growth of the Winchester/Frederick County area.

Access Management

The 2030 Vision Plan also includes the recommendation for several access management studies along the region's most heavily congested travel corridors. Access management seeks to limit and consolidate access along major roadways, while promoting a supporting street system and unified access and circulation systems for development. The result is a roadway that functions safely and efficiently for its use, and a more attractive corridor. This can be accomplished by the implementation of land use access controls through local zoning ordinances, roadway access standards as implemented by VDOT, specific roadway improvement projects to correct current access deficiencies, or a combination of the above. Access management studies were recommended in the 2030 Vision Plan for the following roadway corridors:

- Route 7
- US Route 17/50
- US Route 522
- US Route 11
- Pleasant Valley Road

Congestion Management

Other non-roadway strategies are also recommended in the 2030 Vision Plan to help reduce the need for single-occupant vehicle travel and to help reduce air quality emissions. These strategies include a regional telework centers promotion of flexible work hours, carpooling, staggered start times, carpooling, traffic signal synchronization, and electric hookups at truck stops to reduce truck idling.

Primary Roadway CLRP Projects

Route	Facility Name	Project Limits	Recommendation	Length (miles)	Proposed Typical Cross Section	Program Level	Estimated Construction Cost (\$1,000,000)	CLRP Allocation (\$1,000,000)
277	Route 277 (Pleasant Valley Road)	I-66 to Route 636	Widen to 6 lanes	2.2	US	Construction	\$15,763	\$15,763
37	Route 37 (Pleasant Valley Road)	Route 636 to US Route 102	Widen to 4 lanes	2.8	US	Construction	\$16,285	\$16,285
37	Route 37	I-66 (MP 310) to Route 7	Construct 4-Lane Limited-Access Divided Highway	7.8	RAO	FE	\$30,240	\$30,240
37	Route 37	Route 7 to I-66	Construct 4-Lane Limited-Access Divided Highway	5	RAO	FE	\$32,444	\$32,444
37	Route 37	I-66 (MP 310) to County Route 37	Construct 4-Lane Limited-Access Divided Highway	2.4	RAO	FE	\$11,824	\$11,824
37	Route 37	Eastern End of Proposed Route 37 (Shenandoah Road)	Construct new US Route 102, US Route 17/50, Eastern Road, Route 7, and I-66			FE	\$32,200	\$32,200
Total							\$147,317	\$147,317

Note: Program Level = FE = Preliminary Engineering, RA=Right-of-Way

Secondary CLRP Projects

Route	Facility Name	Project Limits	Recommendation	Length (miles)	Proposed Typical Cross Section	Program Level	Estimated Construction Cost (\$1,000,000)	CLRP Allocation (\$1,000,000)
666	Shenandoah Road	Route 277 to US Route 17/50	Widen to 4 Lanes	0.5	RAO	Construction	\$6,175	\$6,175
666	Shenandoah Road	US Route 17/50 to Shenandoah Road	Widen to Improve 2-Lane Cross Section	0.7	RAO	Construction	\$2,437	\$2,437
666	Shenandoah Road	Shenandoah Road to US Route 17/50	Realign and improve 2-Lane Cross Section	1.1	RAO	Construction	\$2,046	\$2,046
Total							\$10,658	\$10,658

Note: Program Level = FE = Preliminary Engineering, RA=Right-of-Way

Urban CLRP Projects - City of Winchester

Route	Facility Name	Project Limits	Recommendation	Length (miles)	Proposed Typical Cross Section	Program Level	Estimated Construction Cost (\$1,000,000)	CLRP Allocation (\$1,000,000)
1	Winchester Lane	Reconstruct Suburban to US Route 17	Widen to 5-Lane Cross Section	0.4	US	Construction	\$3,100	\$3,100
1	Haga Drive Extension	US Route 17 to Pleasant Valley Road	Widen to 5-Lane Cross Section	0.2	US	FE, Design, RA	\$1,881	\$1,881
1	Pleasant Valley Road	US Route 17 to Pleasant Valley Road	Widen to 5-Lane Cross Section	0.2	US	FE, Design, RA	\$1,262	\$1,262
Total							\$6,243	\$6,243

Note: Program Level = FE = Preliminary Engineering, RA=Right-of-Way

Developer-Funded CLRP Projects

Route	Facility Name	Project Limits	Recommendation	Length (miles)	Proposed Typical Cross Section	Program Level	Estimated Construction Cost (\$1,000,000)	CLRP Allocation (\$1,000,000)
New	Winchester Medical Center	To Be Determined	Railway Extension to connect Medical Center to rest of city	0.5	US	Construction	\$2,250	\$2,250
New	Shenandoah Valley Road	US Route 17 to US Route 17/50	Construct new 4-Lane divided road	2.5	RAO	Construction	\$25,750	\$25,750
761	Old Chester Town Road	Proposed Shenandoah Valley Road	Widen to 5-Lane Cross Section	0.9	US	Construction	\$3,312	\$3,312
664	Shenandoah Road	Proposed Shenandoah Valley Road	Realign and improve 2-Lane Cross Section	0.3	FE	Construction	\$1,214	\$1,214
Total							\$33,526	\$33,526

Note: Program Level = FE = Preliminary Engineering, RA=Right-of-Way

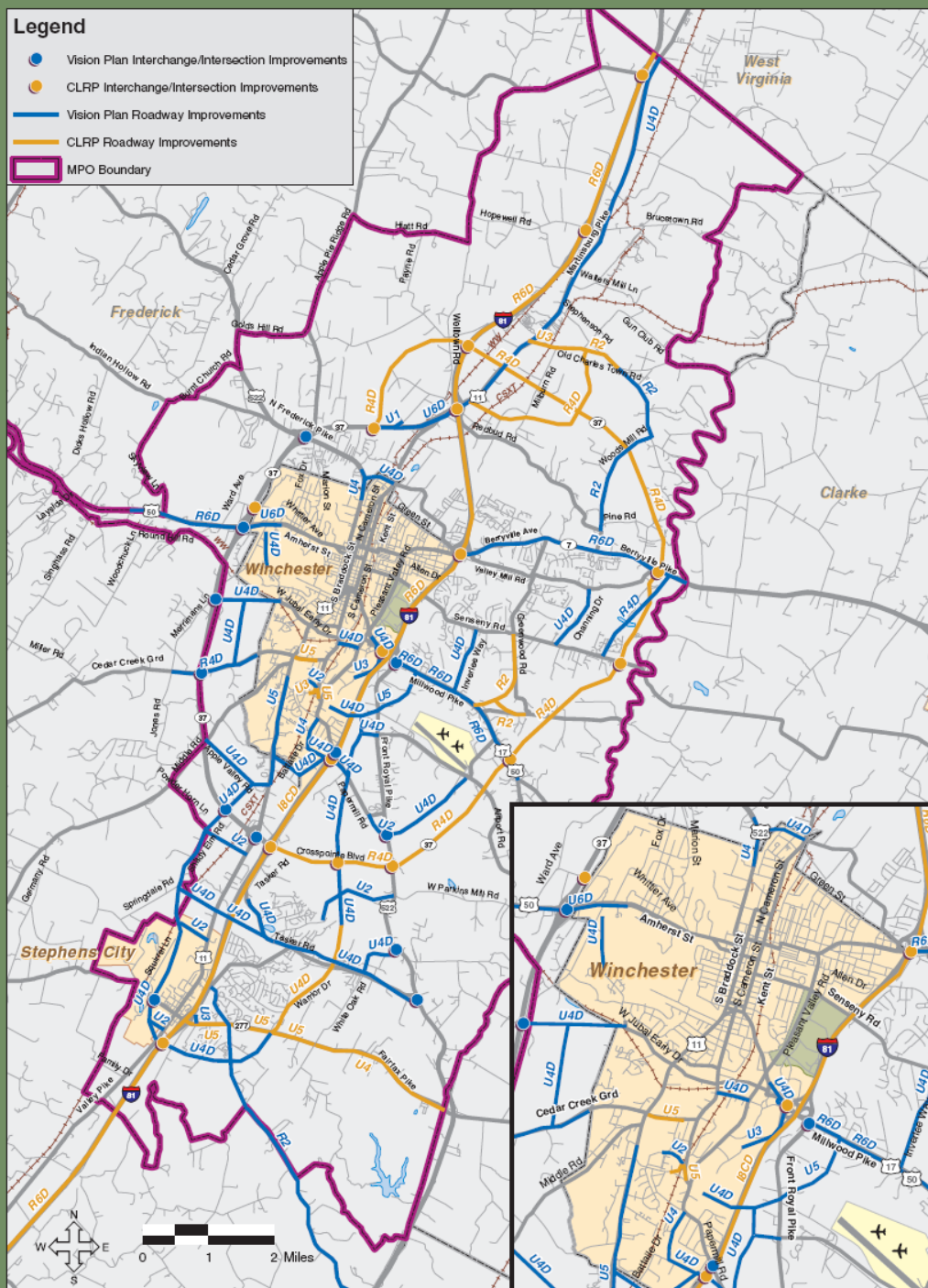
PLAN ADOPTION

The 2030 Transportation Plan was adopted by the Win-Fred MPO Policy Committee on September 21, 2005.

ADDITIONAL INFORMATION

Detailed information on the development of the Win-Fred MPO 2030 Transportation Plan and the study recommendations are included in the Win-Fred MPO 2030 Transportation Plan Technical Report. This report can be viewed or downloaded at www.winfredmpo.org.





2030 Transportation Plan



Appendix Q

Frederick County Planning Commission Draft Meeting Minutes:
Authorization to Apply for
Virginia Department of Transportation Enhancement Grant

**MEETING MINUTES
OF THE
FREDERICK COUNTY PLANNING COMMISSION**

Held in the Board Room of the Frederick County Administration Building at 107 North Kent Street in Winchester, Virginia on September 20, 2006.

PRESENT: June M. Wilmot, Chairman/Shawnee District; Roger L. Thomas, Vice Chairman/ Opequon District; George J. Kriz, Gainesboro District; Charles E. Triplett, Gainesboro District; Gregory S. Kerr, Red Bud District; Christopher M. Mohn, Red Bud District; John H. Light, Stonewall District; Gary R. Oates, Stonewall District; Greg L. Unger, Back Creek District; Cordell Watt, Back Creek District; Robert A. Morris, Shawnee District; H. Paige Manuel, Member-At-Large; Philip A. Lemieux, Board of Supervisors Liaison; and Lawrence R. Ambrogi, Legal Counsel.

ABSENT: Richard C. Ours, Opequon District; and David Shore, City of Winchester Liaison.

STAFF PRESENT: Eric R. Lawrence, Planning Director; Mark R. Cheran, Zoning & Subdivision Administrator; John A. Bishop, Transportation Planner; Susan K. Eddy, Senior Planner; Candice E. Perkins, Planner II; Kevin T. Henry, Planning Technician; and Renee' S. Arlotta, Clerk.

CALL TO ORDER & ADOPTION OF AGENDA

Chairman Wilmot called the meeting to order at 7:00 p.m. Upon motion made by Commissioner Kriz and seconded by Commissioner Triplett, the Planning Commission adopted the agenda for this evening's meeting.

MINUTES

Upon motion made by Commissioner Kriz and seconded by Commissioner Triplett, the minutes of August 16, 2006 were unanimously approved as presented.

COMMITTEE REPORTS

Comprehensive Plans & Programs Subcommittee (CPPS) – 09/11/06 Mtg.

Commissioner Light reported that the CPPS discussed the Eastern Road Plan and they also received an update of the UDA (Urban Development Area) Study, along with a profile of future steps. Commissioner Light said the CPPS discussed two Comprehensive Policy Plan amendments sent by the Board of

Supervisors, which included: Clearview and the Lutheran Church on Route 50.

Historic Resources Advisory Board (HRAB) – 9/19/06 Mtg.

Commissioner Oates reported that the HRAB had three items on their agenda: The Village of Opequon, an RP subdivision proposal, was postponed because the applicant was not available; an application for a historic plaque for Valley Mill Farm on Valley Mill Road was recommended for approval; and they discussed the proposed extension of power lines from Meadowbrook towards the east and the possible historic impacts associated with that extension.

Sanitation Authority (SA) – 9/19/06 Mtg.

Commissioner Unger reported that Mr. John Whitacre spoke about the various projects the SA has been working on throughout the year. He said Mr. Whitacre reported the SA has reviewed 300 projects this year, 34 projects have been completed, and another 120 projects are underway and currently active. He reported that the SA began work on a gravity water and sewer line in the Senseny Road area; and this month, they are getting ready to start their new 7,000 square-foot headquarters building.

Development Impact Model Oversight Committee (DIM-OC)

Commissioner Manuel reported that the DIM-OC will meet next Friday, September 22, at noon. He said the primary discussion will be based on the bonded versus pay-as-you-go funding consideration for the model.

CITIZEN COMMENTS

Chairman Wilmot called for citizen comments on any item that was not on this evening's agenda. No one came forward to speak.

PUBLIC HEARING

Conditional Use Permit #08-06 of Ronald D. DeHaven for a country general store at 5057 Northwestern Pike (Rt. 50). This property is further identified with P.I.N. 39-A-39 in the Back Creek Magisterial District.

Action – Recommended Approval with Conditions

Planning Technician, Kevin T. Henry, reported that the property has frontage along Route 50 Eastbound as well as South Hayfield Road (Rt. 600). He said the single 2,516 square-foot structure on the property, formerly used as a post office, will be reduced in size by 476 square feet to allow for a loading space; the proposed business will require 11 parking spaces. Mr. Henry said the parking lot will be accessed via the westernmost driveway along Route 50 Eastbound. Mr. Henry added that staff has suggested the applicant establish a driveway along South Hayfield Road (Rt. 600) as well. He said the easternmost driveway will be closed to avoid traffic crossing Route 50 at the Hayfield intersection and entering the property illegally; the applicant has offered to close this entrance by placing grass and a fence along the current entrance. Mr. Henry next read a list of recommended conditions, should the Commission find the use to be appropriate.

Commissioner Unger commented that this site has been in business for a very long time and entering the business from Route 50 has always worked; he questioned why the staff wanted to change that now. Mr. Henry said the business was originally nonconforming and since it has been vacant for so long, it has to re-establish itself through the zoning ordinance. Mr. Henry said the existing entrance is not safe, even though a vehicle would only be traveling a short distance in the wrong direction.

Commissioner Mohn inquired if there will be ample distance from the main road, Northwestern Pike, to achieve the recommended entrance on Hayfield Road. Mr. Henry replied that 70 feet off Route 50 is required and the applicant has about 100 feet.

Chairman Wilmot called for public comments; however, no one came forward to speak. Chairman Wilmot then closed the public comment portion of the meeting.

Commission members asked the applicant what he intended to sell in the store. Mr. Ronald DeHaven, the applicant, replied that he would like to offer fresh meats, staples such as bread, butter, milk, and fresh fruits and vegetables from local growers.

Commissioner Triplett asked the applicant if he could operate satisfactorily with the County's expectations on the driveways. Mr. DeHaven replied no; he said Route 600 has safety factors during the winter; he said a store has been operating at this location for the past decade and the existing entrance/exit has always worked. Mr. DeHaven said the shrubs between the two entrances will have to be removed because they block site distance, but he would prefer to keep the existing entrance/exit. Commissioner Triplett agreed about the length of time the structure has operated as a store and a post office and he didn't think the applicant would get much business traffic heading West. Mr. DeHaven agreed he would not get the business traffic heading West, if the eastern entrance is closed and no other put in; he said people would have to drive ½ to ¾ mile out of their way to hit the next crossover and come back down.

Commissioner Triplett asked if VDOT had comments. Mr. DeHaven said he met with VDOT representatives at the site and an entrance coming in off Route 600, is feasible; however, VDOT was concerned about the winter conditions.

Commissioner Watt asked the applicant if he was comfortable with Condition #5, "...no outdoor display of merchandise," since he planned to sell fruits and vegetables. Mr. DeHaven said he was not comfortable with that particular condition. He said he would prefer to sell both inside and outside.

Chairman Wilnot noted the Health Department's comment that there will be no increase in water usage. She asked the applicant for the anticipated number of employees, if there would be any other operations on the property besides sales, and what was the condition of the septic system. Mr. DeHaven replied that the septic system is in good condition; he anticipated two-to-three employees; and the Health Department calls for the site not to exceed 300-500 gallons of water usage per day.

Some Commission members expressed concern about closing the easternmost entrance to the site because they believed it would affect the amount of business traffic Mr. DeHaven would get; they said the existing entrances have been used safely for many years at this site for previous businesses and the old post office. Other Commissioners did not want to see traffic turning onto the eastbound lane of Route 50, even for a short distance, to get into the site because of safety reasons.

Planning Director, Eric R. Lawrence, commented that staff was not regulating or placing parameters on what happens on Route 600, but were simply suggesting the applicant try to establish the entrance. Mr. Lawrence said the staff is willing to work with the applicant and VDOT to find a safe location, if they wish to establish the entrance on Route 600.

Members of the Commission believed a country store at this location was appropriate and in consideration of the staff's comments to work with the applicant and VDOT to accommodate satisfactory entrances for the site, they were in favor of the conditional use permit with the removal of the phrase within the recommended conditions prohibiting outdoor display.

Upon motion made by Commissioner Unger and seconded by Commissioner Watt,

BE IT RESOLVED, THAT the Frederick County Planning Commission does hereby unanimously recommend approval of Conditional Use Permit #08-06 of Ronald D. DeHaven for a country general store at 5057 Northwestern Pike (Route 50), with the following conditions:

1. All review agency comments and requirements shall be complied with at all times.
2. An engineered site plan shall be submitted to and approved by Frederick County prior to business activities occurring on site. Parking lot standards and landscape consistent with commercial zoning will be required.
3. One non-illuminated, free-standing business sign shall be allowed on the property; the sign shall be limited to 25 square-feet in area and shall not exceed 10 feet in height. The existing sign is of a permissible size until a new sign is created; at which time, the existing sign would have to be removed.
4. Only one entrance onto Route 50 and Route 600 shall be permitted. The existing easternmost entrance along Northwestern Pike (Route 50) shall be permanently closed.
5. No fuel sales will be permitted.
6. Any expansion or change of use will require a new conditional use permit.
7. Total structural area shall not exceed 2,600 square-feet.

(Commissioner Ours was absent from the meeting.)

Rezoning #11-06 of Abram's Chase, submitted by Greenway Engineering, to rezone 3.25 acres from RA (Rural Areas) to RP (Residential Performance) District with proffers for 14 single-family homes on small lots. This property fronts on the north side of Senseny Road (Rt. 657), adjacent to the Parkwood Manor Subdivision. The property is further identified with P.I.N. 65-A-27A and 65-A-28A in the Red Bud Magisterial District.

Action – Tabled for 90 Days

Planner Candice E. Perkins reported that the Abram's Chase application is a request to rezone 3.25 acres to the RP (Residential Performance) District to accommodate 14 single-family, small-lot units with an overall density of 4.3 units per acre. Ms. Perkins said the site is within the Eastern Frederick County Long Range Land Use Plan as proposed residential and is located within the Urban Development Area (UDA) and the Sewer and Water Service Area (SWSA). Ms. Perkins next summarized the proffer statement submitted by the applicant. She noted that the recreational amenities provided with the proffer were in-lieu of a community center building, if waived by the Board of Supervisors. She commented that staff believed this proffer is inappropriate because a waiver cannot be sought for the community center until the master development plan (MDP) stage of the process. Ms. Perkins also reported that staff has identified a number of issues that still need to be resolved by the applicant. Specifically, this application has not addressed the Senseny Road improvements, the construction of a bike/pedestrian facility, inter-parcel connections, monetary proffers, and the recreational requirements of the development.

Mr. Evan A. Wyatt with Greenway Engineering was representing the property owner, Harvest Communities, Inc., in this rezoning application. Mr. Wyatt said that regarding the inter-parcel connectivity, the adjoining developments have been designed in such a fashion where connectivity is not conducive for roads like Parkwood Circle or the roads in their project. Regarding the Senseny Road improvements, he said they were willing to construct both an additional travel lane along the frontage of their property, as well as a turn/taper lane; however, the construction of these improvements would necessitate them eliminating their previous proffer of \$1,000 per unit under Transportation Enhancements. Mr. Wyatt said since the north side of Senseny Road has now been established as the County's designated area for the bicycle/ pedestrian facility, they would be willing to construct the ten-foot asphalt pedestrian trail within their road efficiency buffer. He added that they were also willing to amend their proffer statement to reflect the new fiscal impact model amount that was recently adopted by the Board.

Commissioner Unger asked Mr. Wyatt about the possibility of doing an inter-parcel connector at the cul-de-sac to the east, in case that area would develop in the future. Mr. Wyatt pointed out a drainage area through that particular location; he said it could be difficult and expensive to build a road system through there, especially for the few parcels it would benefit. In addition, he said it would compromise the area where they planned to place their recreational amenities. He also pointed out that the other open area on the site was designated for their stormwater detention.

Commissioner Kerr inquired if the vacant lot on Parkwood Circle could possibly be acquired to tie into Parkwood Circle. Mr. Wyatt said they had not looked into that possibility.

Commissioner Oates commented that the wetlands study within the application involved simply examining the County's GIS database, which in his experience, was lacking. Commissioner Oates asked Mr. Wyatt if he had a professional look at the wetlands, since a considerable amount of this property was within the

floodplain. Mr. Wyatt said they assumed the low area of the property will have wetlands; he said the County Engineer is requesting a wetlands delineation study to be submitted with the MDP. Commissioner Oates said that if the wetlands go far enough to the west, the applicant may lose an entire block of housing below the road; he said the applicant may have to think about moving the road and placing homes just on one side. Mr. Wyatt said that as a result of a site-distance study they conducted, the location of the road is pretty much set. Mr. Wyatt assured the Commission the wetland delineation study will be conducted, if the rezoning is approved.

Chairman Wilmot asked Mr. Wyatt if the parcel remaining on Senseny Road was a residence; she asked if there was an opportunity for that lot to tie into this project's road. Mr. Wyatt replied there was a mobile home on the site. Mr. Wyatt said they would not have a problem, if the owner desired to do that. He said they could grant them an access easement to do so.

Chairman Wilmot next called for public comments.

Ms. JoAnn Leonardis, a resident of the Red Bud District, came forward to speak in opposition to this rezoning. Ms. Leonardis said that just because there is a similar development next door, does not mean there should be another one like it and it doesn't mean it is the right thing. She said that just because there are other neighborhoods without connectivity, does not mean another one should be built. Ms. Leonardis said the Planning Department's web site gives ten principles for smart growth and the first one is to create a shared vision of the future; she questioned whether the proposed development supported the County's vision for the future. She noted there was a considerable amount of vacant land adjoining this project and across Senseny Road; she questioned what would be proposed for those areas. Ms. Leonardis said there has been discussion about urban centers and planning for the future; she asked if the 14 homes proposed here was good planning. She noted the second principle for smart growth was to identify and sustain green infrastructure; she suggested the wetlands here be made into something beautiful, with a public place and pedestrian paths.

There was no one else wishing to speak and Chairman Wilmot closed the public comment portion of the meeting.

Planning Director, Eric R. Lawrence, stated that the inter-parcel connection is required by an ordinance adopted by the County in approximately June of 2005 and is not a debatable issue. Mr. Lawrence said this issue will have to be addressed, unless the inter-parcel connection is waived by the Board. Mr. Lawrence stated it was also not appropriate for the applicant to adjust the cash proffer contribution at this point in the process; he said when an applicant submits a rezoning application to the county for consideration, that is the model to be considered. Regarding the issue of the waiver of the community center, Mr. Lawrence said the ordinance states the waiver is sought at the MDP stage; however, if there is no required MDP, it is done at the subdivision stage. He explained that the Board of Supervisors will see either the MDP or the subdivision and that is the level where consideration of the waiver should be taken. In addition, Mr. Lawrence addressed the issue of the entrance separation along Senseny Road; he said the VDOT subdivision design manual recommends a 500-foot separation; therefore, the 200 foot proposed certainly does not meet the desired separation.

Commissioners said they were having difficulty finding any redeeming values in the proposal from a planning standpoint. They were also concerned this project may set a precedent for similar developments. The possibility of having six cul-de-sacs within a 1,200-foot distance, each with 134 trips per day, was reason enough for concern, let alone the existing traffic problems along Senseny Road. They questioned whether approving this rezoning as presented would be good planning for Frederick County.

Commissioner Mohn believed all of the comments made were a good representation of where the County would like to proceed with development in the UDA. However, he was concerned about the next step for this particular area, which seemed to be a conglomeration of small parcels. He said this area is within the UDA

and it is planned for residential; he questioned how these parcels will be integrated to create good planning. In fairness to the property owners, he said the County may be waiting a long time for land to assemble and come up with a solution. He suggested the County may be able to help, through the UDA Study, with identifying what the alternative could be and making sure it functions properly.

Commissioner Kerr said he would like to see the applicant be given more time to address some of the issues because he believed there was a way to make this project work. He said he didn't support the project as it was presented, but, unfortunately, it is an in-fill situation, which makes it difficult. Commissioner Kerr suggested that the applicant be given the opportunity to go back and address the issues that were raised.

Upon motion made by Commissioner Kerr and seconded by Commissioner Kriz,

BE IT RESOLVED, THAT by a majority vote, the Frederick County Planning Commission does hereby agree to table Rezoning #11-06 of Abram's Chase, submitted by Greenway Engineering, to rezone 3.25 acres from RA (Rural Areas) to RP (Residential Performance) District, for 90 days, in order to give the applicant time to address the issues raised.

The vote was as follows:

YES (TO TABLE): Unger, Watt, Manuel, Morris, Oates, Light, Wilmot, Kriz, Triplett, Kerr, Mohn

NO: Thomas

(Note: Commissioner Ours was absent from the meeting.)

Rezoning #10-06 of Albin Center, submitted by Artz & Associates, to rezone 2.07 acres from RA (Rural Areas) District to B2 (Business General) District with proffers for commercial use. The property is located on the east side of Bryarly Road (Rt. 789), approximately 800 feet south of the intersection with Burnt Church Road (Rt. 678). The property is further identified by P.I.N. 42-A-249 in the Gainesboro Magisterial District.

Action – Recommended Denial

Commissioner Manuel said he would abstain from all discussion and voting on this rezoning, due to a possible conflict of interest.

Senior Planner Susan K. Eddy reported that the applicant proposes to construct a two-story building with 25,000 square feet of floor space and a building height of 60 feet on a vacant site. Ms. Eddy said all of the properties surrounding this site are zoned RA (Rural Areas). She said the site is located outside of the Sewer and Water Service Area (SWSA) and the Urban Development Area (UDA). Ms. Eddy said the site is within the Albin Rural Community Center of the Comprehensive Policy Plan. Although the Comprehensive Plan was not specific regarding policies for the Albin Rural Community Center, there were some general policies, which she read for the Commission. One in particular said to promote "village commercial development at a scale and nature that is appropriate for the rural community center." She said typically, expected uses would be general store, bank, and restaurant in a rural community center; however, in this case, the proposal is for office use, which is not necessarily designed to serve the local community. She added that the height and size of the structure will be out of character and overwhelm its surroundings. She further added that the buildings in the Albin Rural Community Center are approximately 25 feet in height with an average of 2,000 square-feet of floor

space. With the aid of a 3-D modeling program, Ms. Eddy next proceeded to show how the proposed building relates in scale to the surrounding community center.

Regarding transportation issues, Ms. Eddy said Route 522 is a major arterial road and the Comprehensive Plan discourages private driveways on major arterial roads. She recommended that the access be via Bryarly Road, if the proposal is to function as a part of the Albin Rural Community Center. Also, Ms. Eddy said she was specifically asked by the Historic Resources Advisory Board (HRAB) to point out that the applicant did not attend the two meetings when this item was scheduled. She said the HRAB did finally provide comments without the benefit of an applicant presentation. She reported that the HRAB said the development was completely incompatible with the character and the context of the Albin Rural Community Center and they did not support the application. Suggestions given by the HRAB to possibly make the structure compatible were to use a series of smaller structures, instead of one large structure; the use of compatible materials similar to the surrounding area; and not to exceed a maximum height of 25 feet.

Ms. Eddy next reviewed the proffer statement supplied by the applicant. She noted that the applicant is not limiting the proposal to office uses. She also noted that the Generalized Development Plan (GDP) is very detailed, which is cause for concern because the Planning Staff and other agencies are not reviewing the GDP for site plan compliance at this time. She said this presents the danger of site details slipping through without meeting zoning requirements.

Mr. Michael Artz, with Artz & Associates, PLC, came forward to represent the property owners, Mr. David A. Hicks and Mrs. Linda W. Hicks. Mr. Artz said the GDP was detailed in order to give the Commission the opportunity to see the final site development. Mr. Artz believed the project was a good opportunity to provide employment for county residents; he pointed out this area does not have a lot of this type of use. Mr. Artz explained it was their intention to add some retail uses in order for this to be compatible with the Albin Rural Community Center, which was why the video rental, general merchandise retail, and miscellaneous retail were kept as part of the proffered uses. Regarding the entrances, Mr. Artz said he believed access into the site through Bryarly Road was important; however, at a minimum, there needs to be an exit out onto Route 522 to provide an opportunity to lessen traffic impacts on Bryarly Road. He said discussions with VDOT indicated the possibility for an entrance from Route 522, if an existing cross-over was closed and additional turning lanes were constructed.

In addition, Mr. Artz said the Health Department has located a primary drainfield site and a reserve drainfield site and they are satisfied it meets the proposal's needs. He said the applicant is in the process of having these sites engineered for alternative drainfield sites. He stated that areas of the site designated as drainfield have not been disturbed. It was Mr. Artz's opinion that the structure was in character with the surrounding area; he realized it was larger, but it had roof lines and architectural details that separated it from the typical office building. He noted that this particular site was lower than the surrounding area and the height of the building may not be so out of character. He said they proffered not to exceed 60 feet in height, but in all probability the building would be about 50 feet in height.

Commissioner Oates inquired about the amount of usage the septic fields could handle; he said that medical office use and restaurant use has much higher water usage than a typical office use. Mr. Oates was concerned about the applicant using an infiltration system, since the site had already been disturbed. Mr. Artz said they will not be installing an infiltration system; he said they will be utilizing underground storage.

Commissioner Thomas asked Mr. Artz why the applicant was asking for a 60-foot height when it appears the structure is only two stories; he said if the building could be constructed at 35 feet, it would probably be more in scale with the surrounding area. He also inquired about the possibility of building two or three smaller structures connected by walkways so the building would not appear to be so massive. Mr. Artz replied that the 60 feet was the code limitation; however, as they've proceeded with this project, they've determined that the height

of the building would probably be about 48 feet. He said his client is trying to maintain the architectural facade with the steep roof lines, which they feel is more in keeping with the area. Mr. Artz again noted that the site is lower than the surrounding area. Mr. Artz said he would change the proffer to read 50-feet in height, instead of 60 feet.

Commissioners talked with Mr. Artz about sewage discharge sites. Mr. Artz said there were two locations on the site plan; he pointed out the primary installed drainfield site and the reserve drainfield site. They asked Mr. Artz if the Health Department determined a maximum number of employees within the building. Mr. Artz felt it was too early to know; he said they first need to identify the uses. Commissioners asked Mr. Artz if he would be able to meet the maximum parking and buffer criteria, especially since there were no B2 uses proffered out.

Commissioners were concerned about the wide range of uses the applicant had requested to be left available and the square footage proposed. They believed a great deal more water consumption and waste production could occur with intensive use of the site. They questioned the appropriateness of putting 25,000 square feet of floor area on a septic system on a two-acre lot because of the unknowns dealing with the septic capabilities, the stormwater management capabilities, and the parking capabilities. There was also concern about the transportation impact because the range of uses had not been determined.

Mr. David Hicks, the property owner, said the drainfield will be under the parking lot. He said Mr. Bob Holmes of Greenway Engineering designed the system and it has been approved by the Health Department. Mr. Hicks said there will be 94 parking spaces and there will be 2,000 square-foot offices. He said the health system is approved for 1,050 gallons per day, times two, because no one will occupy the building at night.

Chairman Wilmot next called for public comments and the following persons came forward to speak:

Ms. Cheryl A. Lineweaver, a 13-year resident of the Albin community, along Bryarly Road, in the Gainesboro District, came forward to speak in opposition to the rezoning. Ms. Lineweaver presented written statements from Albin residents who could not attend this evening's meeting, but who were also in opposition to the structure size and the rezoning. Ms. Lineweaver said the residents of Albin were not interested in restaurants or retail stores. She said this proposal does not fit into their neighborhood. She said the Albin community consists of small homes with country folk. She said they were concerned about any increased traffic on Bryarly Road because of all the people and children that walk and play on their roads. She said they have a problem with the speed limit now at 45 mph. She said Bryarly Road was one of the last roads to be cleared of ice and snow during winter.

Mr. Donald Kidwell, a resident at 169 Dunbar Lane, was concerned about the potential for increased storm water run-off onto his property. He said when Route 522 was constructed, part of this ground was held as a water-holding area for Route 522. He thought the proposed structure was too large to be placed on a two-acre parcel. Mr. Kidwell said the neighbors were worried their wells would become polluted; he said the community does not need this building.

Mr. Wayne Burr, a resident at 255 Bryarly Road, also commented that the residents of Albin Village do not want this building. He said his family's farm is over 100 years old; he felt the proposed structure would take away from the rustic farm-community look of Albin. He said the residents of Albin believe the existing traffic on Bryarly Road is too heavy. Mr. Burr said the community residents ride horses up and down the road; he said children and pets play on the road. Mr. Burr said he has a tractor and takes care of snow removal for the neighbors and it works out satisfactorily; he said they do not want to see commercial trucks in their community doing this work.

Mr. Ronald L. Lineweaver, the husband of Cheryl Lineweaver who previously spoke, said his parents moved to Albin when he was one-year old and he is now 52. Mr. Lineweaver spoke about the elderly residents who cross Bryarly Road daily to get their newspapers. He described Albin as a country community and the residents wanted to keep it that way. He said the 35-foot building that was recently constructed in Albin looks out of place and one can not help but notice it; he said this proposal is for a structure much larger. Mr. Lineweaver was also concerned about run-off because he lived in a low area, known as the hollow.

Ms. Betty Kidwell, said she has lived in the hollow for 61 years. She said there was an old, three-bedroom house on this site; she was concerned where all the septic would go for an office building of this size. Ms. Kidwell commented that there were convenience stores, fast food restaurants, and grocery stores five minutes down the road and she felt this retail building was not needed. Ms. Kidwell believed such a large building would spoil the neighborhood because it would not blend in with the surrounding homes.

Ms. Rita Crosen, a resident of Gainesboro District, was opposed to the project. She didn't believe everything had been thought through with this proposal and that possibly, the whole story had not been provided. Ms. Crosen said she and her husband lived about 3/10 mile up the road from this site for 47 years and raised their family. She said that all ages reside in this community and it consists of average-sized homes. She was concerned about the traffic on Bryarly Road; she said there is very little shoulder room on Bryarly Road for joggers and pedestrians; she mentioned that many children ride their bicycles on the road. Ms. Crosen believed this new structure would add a great deal of traffic to the area. She said there was no public water here. She said because the uses were unknown, no one knows how much water will be pumped out. She was concerned about the residents' wells continuing to function properly. She felt there should be a better place in the county for a building of this size, not in this family-oriented community.

Ms. Sharon Robinson, an adjoining property owner, was also opposed to the rezoning. Ms. Robinson was concerned about the hours of operation for some of the proposed retail stores. She was concerned about the amount of traffic into the late evening hours with a retail use. She was also concerned about the water runoff in the low-lying areas.

Ms. Rita Hester, an adjoining property owner, said the applicant's reserve septic site was very close to her property and she was not pleased. She said that if there is a problem with the septic, she would be the one to experience it and she did not want to be the one trying to figure out who would fix the problem. She said this area is all residential; she said she would like to see the zoning stay as rural use. She concurred with all the statements made by the Planning Staff concerning the reasons why this use and structure were inappropriate. She said there is considerable existing traffic. She said the entryway at Route 522 and Burnt Church is difficult now. She said that she is concerned with possible crime with retail and general merchandise sales, or even restaurants. She was concerned about rodents, noxious smells, and security lights. She said she can see the security lights from the new Shade Equipment building, nearly one mile away. Ms. Hester said the character of the building does not fit in with the community and the residents do not want the zoning changed on this property.

Since everyone who wished to speak had been given an opportunity to do so, Chairman Wilmot closed the public comment portion of the meeting.

Mr. Artz returned to the podium to address some of the comments that were made. Mr. Artz said he would be willing to eliminate the access on Bryarly Road to satisfy the residents concerns about increased traffic. He said he would also adjust the height of the building. He commented that every site has its particular issues that are unique and they will work within the constraints of the zoning regulations to address the particular issues of this site.

Commissioner Kriz commented that none of the citizens who spoke were in favor of the rezoning and did not believe the structure or the proposed use fit in with their community. He also thought there were too many uncertainties with the proposal.

Commissioner Morris believed the uniqueness of each rural community center should be defined in a land use plan according to the views of the citizens who live there.

Commissioner Mohn added that the Comprehensive Policy Plan does not support this proposed commercial use at this location.

Commissioner Kriz moved to deny the rezoning request and the motion was seconded by Commissioner Triplett. The motion passed by a majority vote.

BE IT RESOLVED, THAT The Frederick County Planning Commission does hereby unanimously recommend denial of Rezoning #10-06 of Albin Center, submitted by Artz & Associates, to rezone 2.07 acres from RA (Rural Areas) District to B2 (Business General) District for commercial use.

The vote was as follows:

YES (TO DENY REZ.) Unger, Watt, Morris, Oates, Light, Thomas, Kriz, Triplett, Kerr, Mohn, Wilmot

ABSTAIN: Manuel

(Commissioner Ours was absent from the meeting.)

**AUTHORIZATION TO APPLY FOR A VIRGINIA DEPARTMENT OF TRANSPORTATION
ENHANCEMENT GRANT TO IMPLEMENT BICYCLE AND PEDESTRIAN IMPROVEMENTS IN
THE VICINITY OF SENSENY ROAD ELEMENTARY SCHOOL.**

Action – Recommended Approval

Transportation Planner, John A. Bishop, reported that staff has been working on developing an application for a VDOT Enhancement Grant, which is basically federal funds that come through VDOT and are distributed by the Commonwealth Transportation Board. Mr. Bishop explained there is a 20% required match with an award; however, the application itself does not obligate County funds. He further explained that if there is an award, the Board of Supervisors would determine at that time whether to put forth County funds.

Mr. Bishop stated that for this year's application cycle, the staff has recommended an application for enhancements to bicycle and pedestrian transportation in the vicinity of Senseny Road Elementary School. He said the proposed project would add paved multi-use paths to the northern and southern sides of Senseny Road between Meade Drive and Williamson Road. Mr. Bishop said this is a border area between Red Bud and Shawnee Districts and is at the heart of the most populated districts in the County.

Mr. Bishop stated that the plan was reviewed by the Transportation Committee on August 28, 2006 and they gave their unanimous endorsement.

Commissioner Kriz, a member of the Transportation Committee, said all members of the Transportation Committee were very supportive of this endeavor and he saw no reason why the Planning Commission should not support it.

Chairman Wilmot called for public comments. No one came forward to speak and Chairman Wilmot closed the public comment portion of the hearing.

Upon motion made by Commissioner Kriz and seconded by Commissioner Triplett,

BE IT RESOLVED, THAT the Frederick County Planning Commission does hereby unanimously recommend approval for authorization to apply for a Virginia Department of Transportation Enhancement Grant to implement bicycle and pedestrian improvements in the vicinity of Senseny Road Elementary School.

(Commissioner Ours was absent from the meeting.)

PUBLIC MEETING

Master Development Plan #11-06 for Freedom Manor, submitted by Greenway Engineering, to develop 26.87 acres of RP (Residential Performance) zoned property with 70 single-family homes. The property fronts on the east side of Papermill Road (Rt. 644), approximately 2,300 feet west/ northwest of the intersection of Papermill Road and Front Royal Pike (Rt. 522). The property is further identified with PIN 64-A-23 in the Shawnee Magisterial District.

Action – Recommended Approval

Planner Candice E. Perkins reported that this master development plan (MDP) is an application to develop 70 single-family detached urban dwellings on property which was rezoned to RP (Residential Performance) in 2005 with proffers. She noted that access to the site is proposed via one primary entrance onto Papermill Road (Rt. 644) and one entrance onto Front Royal Pike (Rt. 522) which will use a traffic-calming method to discourage cut-through traffic. Ms. Perkins next reviewed with the Commission some of the significant proffers associated with the rezoning. She concluded by stating that the MDP is consistent with the requirements of the zoning ordinance and has addressed all of staff's concerns.

Mr. Evan A. Wyatt with Greenway Engineering was present to represent the applicant, Steve A. DeBrueler, et als and the Freedom Manor project.

Chairman Wilmot called for public comments and the following person came forward to speak:

Mr. Larry Omps, owner of the adjoining property, Omps Funeral Home, at 1260 Front Royal Pike, said he had no opposition to the MDP. However, Mr. Omps expressed concern about the traffic-calming measure to be incorporated with this development. He said the funeral home can not control the size of visitations and through past experience, they have had automobiles parking all over the roads in the evening. Mr. Omps was concerned that emergency vehicles may not be able to get through the traffic-calming area, if vehicles from the funeral home have parked along that part of the street.

Since there was no one else wishing to speak, Chairman Wilmot closed the public comment portion of the hearing.

Commissioner Kriz asked Mr. Wyatt if the traffic calming feature could be moved. Mr. Wyatt said the location of the choker was shown on the proffered GDP with a 56-foot right-of-way throughout the entire lane. Mr. Wyatt said they would be willing to slide the choker up or down, as long as it doesn't impact any lots or impede their ability to locate a driveway entrance on a lot.

Upon motion made by Commissioner Morris and seconded by Commissioner Kerr,

BE IT RESOLVED, THAT the Frederick County Planning Commission does hereby unanimously recommend approval of Master Development Plan #11-06 for Freedom Manor, submitted by Greenway Engineering, to develop 26.87 acres of RP (Residential Performance) zoned property with 70 single-family homes.

(Commissioner Ours was absent from the meeting.)

DISCUSSION

Discussion of an amendment to Section 165-55 of the Frederick County Zoning Ordinance regarding building setbacks in the RA (Rural Areas) Zoning District.

Zoning and Subdivision Administrator, Mark R. Cheran, reported that the Development Review and Regulations Subcommittee (DRRS) is seeking to improve existing setback distances and clarification; he said the DRRS believed the proposed amendments would clear up any confusion regarding adjoining land uses and avoid conflicts with active agricultural uses. Mr. Cheran stated that the proposed changes would also apply to family division lots; he said currently, family lots need only 50 feet for side and rear setbacks, regardless of the adjoining uses.

Commissioner Thomas raised the possibility of revising the second category, *Residential/ Agriculture/ Vacant 5.1 acres or more*, to 200 feet rather than 100. He raised the example of an existing, vacant agricultural lot; an orchardist, for example, would be required to put in a 100-foot setback to re-establish his orchard, thereby losing trees originally placed up to the property line. A suggestion was made to add a fourth category, *Residential 5.1 acres or more at 100 feet*.

Commissioner Kriz agreed. Referring to Commissioner Thomas's example, he said even if one orchard isn't replaced by another, it could be replaced by a small fruit farm and there would be spraying. He said with the recent changes in agriculture and more niche marketing, it would make sense to increase the setback. Other Commission members agreed agriculture should be protected as much as possible.

Commissioner Oates questioned whether 5.1 acres of land could be classified as agriculture; he thought 20 acres or more would be more appropriate. Commissioner Oates recommended eliminating the 100 foot setback and using the classification, *Agriculture/ Orchard/ Agricultural & Forestal Districts 20 acres or greater*.

Commissioner Mohn commented that if a legally non-conforming lot is adjacent to an orchard or agriculture, a 100 or 200 foot setback is required for their dwelling. He said if the non-conforming status makes it difficult or impossible to build with this setback, the owner has the option of going to the BZA with a hardship. He believed the primary objective was a matter of protecting the agricultural uses and potential agricultural lands from encroachment or incompatible land uses, regardless if it was an orchard or a cornfield, all deserved the same protection.

Commissioner Morris agreed with the larger setback as well. He suggested the possibility of considering a waiver in the rare occasions when the setbacks can not be accommodated.

Commissioner Oates noted that within the City of Winchester, the Zoning Administrator has the ability to grant a waiver up to a certain percentage of the sideyard setbacks. He thought the DRRS might possibly consider this for the County during their discussions. Commissioner Oates said that if it was within the Zoning Administrator's power to grant a waiver, a person may not have to go to the BZA if the footage is close. He anticipated the possibility of a considerable number of cases going to the BZA, if there is no mechanism for an easier solution.

Mr. Cheran suggested this item be taken back to the DRRS for further discussion and review and to incorporate the comments received from the Planning Commission. Commission members agreed.

OTHER

REVISED DEVELOPMENT IMPACT MODEL

Chairman Wilmot announced the distribution of a new, revised development impact model which was approved by the Board of Supervisors on September 13, 2006. She said it may not be unusual to see these revisions annually as figures change and become further refined.

VESTED RIGHTS

Chairman Wilmot suggested a discussion be held on the subject of vested rights at the Planning Commission's next regularly scheduled meeting.

THREE-DIMENSIONAL MODELING

Commissioner Oates stated that the three-dimensional modeling used by the staff at this evening's meeting was very valuable and he believed the Planning Department needed to look into budgeting money and obtaining that software for future use. Commissioner Thomas suggested the possibility of having the applicants submit it as part of the application.

ADJOURNMENT

There being no further business to discuss, the meeting adjourned by a unanimous vote at 10:00 p.m.

Respectfully submitted,

June M. Wilmot, Chairman

Eric R. Lawrence, Secretary

DRAFT

Appendix R

Frederick County Conservation Easement Authority Materials

Fact and Fiction

Myth: A conservation easement prohibits all development.

Fact: It doesn't. The landowner and the easement holder negotiate the specific terms of the easement. Typically, easements allow limited development that is compatible with overall conservation objectives.

Myth: You can't sell your land.

Fact: You can. Land subject to an easement can be freely sold, donated, passed on to heirs and transferred in the normal fashion, so long as it remains subject to the terms of the easement.

Myth: You have to grant public access to your land.

Fact: You don't. Public access is usually not included in an easement, and is only granted with the landowner's written agreement.

Myth: You can't continue to farm, hunt, fish, or harvest timber on your land.

Fact: You can. In fact, virtually all traditional uses are encouraged under conservation easements.

Myth: You must have over 100 acres to participate.

Fact: You don't. Smaller parcels are eligible to participate in the county's program.

Frederick County Conservation Easement Authority

The Frederick County Conservation Easement Authority was established in 2005 to provide a means to assist county landowners in protecting and preserving farm and forest land, open space, scenic vistas, historic sites, water resources and environmentally sensitive lands. The primary method for accomplishing this mission is for the Authority to facilitate, and in some cases hold, conservation easements. Authority members and county staff welcome the opportunity to meet with landowners and members of the public to discuss land preservation and how conservation easements can benefit everyone.

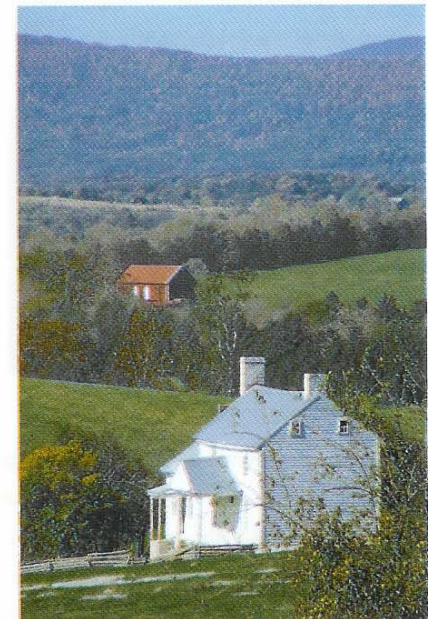
2005—2006 Easement Authority Members

Richie Wilkins	(540) 662-7215
Barbara Van Osten	(540) 667-7673
Bud Good	(540) 858-3307
Robert Solenberger	(540) 662-2938
Diane Kearns	(540) 667-3390
Todd Lodge	(540) 539-6279
John Light	(540) 722-9394
Phil Glaize	(540) 662-6251
Jim Lawrence	(540) 667-0761

Conservation Easement Authority
Contact: Susan Eddy
c/o Frederick County Planning Department
107 North Kent Street, Suite 202
Winchester, VA 22601

Tel 540/665-5651
Fax 540/665-6395
Email: seddy@co.frederick.va.us

PROTECTING YOUR LAND



Preserving our Rural Character

In recent years, Frederick County has been experiencing rapid growth. Consider this: in 1999, 137 new lots were created in rural areas. In 2005, this number more than doubled to 310. With continued expansion, our farms, forests, open spaces and historic resources are shrinking, making the need to protect what remains more important than ever. Many landowners want to see the land they love preserved forever. Because of conservation easements, the county and landowners now have a mechanism to work together to help retain the valued character of Frederick County.



What is an Easement?

A conservation easement is a voluntary legal agreement between a landowner and a public body or a private conservation group. The parties agree to protect the open-space and natural resource values of the land. The easement is recorded in the local courthouse. Each easement is tailored to reflect the conservation value of the property and the individual goals of the landowner.



Protection for Now. And for the Future.

A conservation easement enables landowners to protect their land permanently, assuring them that their property will remain rural and undeveloped, and restricting it from conversion to large-scale subdivisions or industrial/commercial uses. Landowners can still farm, operate bed-and-breakfasts, and conduct forestry and vineyard operations. And of course, landowners can maintain ownership and enjoy their land as long as they desire. Then when the land is sold or passed to heirs, it will still be protected.



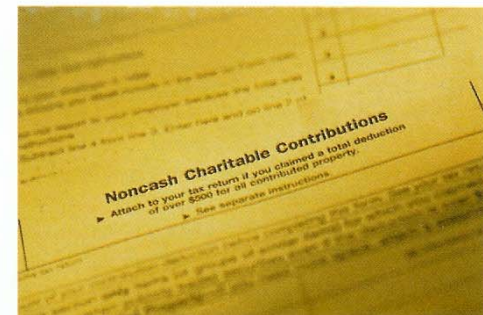
Tax Benefits



While conservation easements protect land for future generations, they also offer current tax advantages to the landowner. Through lower estate taxes, for instance, a family that might otherwise be forced to sell their land would be able to pass their land down to the next generation.

In many cases, a gift of a qualified conservation easement in perpetuity may qualify as a non-cash charitable gift which may yield a federal income tax deduction and state tax credit. In addition, any unused portion of the state tax credit may be sold to another Virginia taxpayer.

The value of the gift, determined by independent appraisal, is the difference in the market value of the land before and after donation of the easement.



Frederick County Conservation Easement Application



Frederick County Conservation Easement Authority
c/o Frederick County Planning Department
107 N. Kent Street
Winchester, VA 22601
540-665-5651

Other items to be submitted with application:

Deed- A copy of the original deed with the deed book and page number stamp, under which the owner acquired the property.

Survey/Plat- A survey or plat must accompany the deed.

Deeds of Trust- If there are any deeds of trust (mortgages) on the property, a copy of the original deed of trust with deed book and page number stamp.

Owner

Additional Owner(s)

Mailing Address

Phone Number

Property Information

Contact Planning Department if unknown

Property Identification Number (PIN) _____

Magisterial District _____

Frederick County Zoning Classification _____

Land Use _____

Parcel Acreage _____

Ownership Details

Type of Ownership (Sole Owner, Husband and Wife, Partnership, Corporation, Limited Liability Company, Etc.)

Identify all lien holders on the parcel, including, without limitation, holders of deed of trust liens and judgment liens (attach separate sheet if needed)

I/We hereby give permission to the Frederick County Conservation Easement Authority Program Administrator to enter the above mentioned property after reasonable notice for evaluation and for the County's assessor or an independent appraiser to appraise the property.

Owner(s) _____	_____
Print	Signature
_____	_____
Print	Signature
_____	_____
Print	Signature
_____	_____
Print	Signature

Property Qualification

The following historical, geologic, environmental, and geographic questions need to be answered to the best of your ability to complete the application. If you cannot answer a particular question or you are not sure of the answer, please contact the Planning Department to assist you in completing the application.

Use separate sheets of paper for more detailed descriptions.

Open Space

Identify any adjoining existing permanent conservation easement(s); or national, state or local park? If so, how long is the shared boundary?

What, if any, are the usable development rights on the parcel?

Threat of Development

Is the parcel zoned for a nonagricultural use? If so, what is it zoned?

Can you identify if the parcel is deemed to be threatened due to it's proximity to the County's Urban Development Area or Sewer and Water Service Area boundary or to property that has been developed for a nonagricultural use within the last three years?

Natural, Cultural, Recreational, and Scenic Resources

Identify if the parcel adjoins a state maintained road, designated Virginia scenic highway/byway, or a nondesignated public road? How much road frontage, in feet?

Does the parcel or adjoining parcel(s) front a public trail or is identified as part of a planned trail network? Please identify.

Is the parcel within or adjoining a national or state historic park or Civil War battlefield, listed on the State or National Register of Historic Places, or is subject to a permanent easement protecting a historic resource? If yes, please explain.

Please identify if the parcel contains or adjoins a parcel with a historic structure identified by the Frederick County Rural Landmark Survey or otherwise documented as being over 100 years old.

Does the parcel contain identified archeological resources? Please list them.

Please identify if the parcel is within a watershed or subwatershed identified as impaired on the Virginia Department of Environmental Quality's Impaired Waters List.

Please list any perennial stream(s) identified by the USGS 7.5 minute series quad maps or another reliable source, located on the parcel. If so, how many feet of stream frontage?

Can you identify if the parcel is within a sensitive groundwater recharging area as demonstrated by the presence of sinkholes or karst topography?

Identify any perennial springs or wetlands on the parcel.

Farm or Forestland Protection

Identify any prime farmland as identified by the 1987 USDA Soil Survey of Frederick County contained on the parcel. List acreage and soils.

Identify any agricultural or forestal districts or taxation related agricultural or forestal land.

Identify any approved nutrient management plans and/or agricultural best management practices as approved by the Lord Fairfax Soil and Water Conservation District or Natural Resources Conservation Service.

Can you demonstrate that you have in place a conservation plan or participate in a recognized program that restores and/or protects stream channels, riparian zones, and wetlands? If so, please describe.

Fund Leveraging

Can you identify if nonlocal government funding will be used towards costs associated with the conservation easement. If so, list the price.

Appendix S

Virginia Outdoors Foundation Easement Program

VIRGINIA OUTDOORS FOUNDATION

Board of Trustees Meeting

Agenda

November 15 & 16, 2006

The Virginia Department of Forestry

2nd Floor Board Room

Charlottesville, Virginia

Agenda for November 15, 2006

1:00 p.m.

Call to order by the Chairman

Kat Imhoff

Introductions

Public Comments

Approval of the Order of Business

Approval of the Minutes of the Previous Board Meeting

POLICY DISCUSSIONS

Board Meeting Dates for 2007

401K Retirement Plan

Easement Template

December 2006 Meeting

Bob Lee

Sara Ensley

Bruce Stewart

Bob Lee

Under 50 Acres

1 . Donor's Name	Acres	County	Staff	Page #
2 . Berg, Mary Hyde - Summerfield Wild Area	42.92	Gloucester	ET	1
3 . Bolden, Bill - Rokeby	50.00	King George	ET	13
4 . D. W. Tipton Trust	27.00	Scott	NK	25
5 . Dalton Family, LLC	26.09	Northumberland	ET	33
6 . Hallock, Alta Andres	22.85	Albemarle	ET	45
7 . McClung, Anne D.	33.16	Rockbridge	LT	55
8 . Norris, Walter and Lynn - Plainview	46.21	Westmoreland	ET	67
9 . Potomac Appalachian Trail Club	46.93	Frederick	LT	81
10 . Sanford, Stephen R. and Norma H.	40.16	Orange	SB	89
11 . Weanack Land, LLP	26.41	Charles City	BS	99

Preservation Trust Fund Proposals

Donor's Name	Acres	County	Staff	Page #
12 . Arey Camp, LLC	226.50	Augusta	LT	123
13 . Clemmer, Larry W. and Pamela E.	226.00	Augusta	LT	147
14 . Denhoff, Rebecca E.	90.70	Botetourt	LT	163
15 . Guy, Lynwood M. - Locust Grove	162.00	Northampton	BS	179
16 . Lyons, Don and Carolyn	84.20	Grayson	TV	207
17 . McCray, W. T. and Mary Lee	156.61	Augusta	LT	221
18 . Showalter, Ray J. and Deborah E.	117.59	Rockingham	LT	237
19 . Spraker - Dairy Farm	272.00	Wythe	TV	253
20 . Spraker - Horse Camp Land	166.00	Wythe	TV	267
21 . Swink, Marie Zollman, Kenneth, and Betty Dixon	486.00	Rockbridge	LT	281
22 . Truman, Louise Hurt	227.40	Franklin	TV	299
Sisters of the Blessed Sacrament (Under separate cover)	1,099.30	Powhatan	TV	

Reconsideration

	Donor's Name	Acres	County	Staff	Page #
23 .	Harris, William - Woodside	9.00	Spotsylvania	ET	319
24 .	Shelton, Julia - Woodside	68.00	Spotsylvania	ET	339

Co-hold Proposals

	Donor's Name	Acres	County	Staff	Page #
25 .	Vaughan, Estate of Thomas Jefferson Vaughan	62.90	Grayson	TV	349

Closed Session for discussion of personnel and legal matters as provided for in the Code of Virginia §2.2-3711

Agenda for November 16, 2006

9:00 a.m.

Call to order by the Chairman

Kat Imhoff

Introductions

Public Comments

Easement Proposals

Donor's Name	Acres	County	Staff	Page #
26 . Allen, John - Hobson Farm	120.00	King George	ET	359
27 . Baker, Miles - Wakema	172.80	King William	ET	371
28 . Barnes, Carolyn Zehmer	75.00	Albemarle	ET	383
29 . Batten, Frank and Jane	70.10	Middlesex	ET	397
30 . Belle Monte LLC (Ron Trzenski)	584.55	Greene	SB	409
31 . Bemiss, Margaret Page	196.09	Hanover	SB	423
32 . Bess Company, Inc. (Bryan K. Shields)	73.16	City of Danville	SB	437
33 . Bishop, Richard, Kyle, and Ida Mae	87.00	Montgomery	TV	455
34 . Bishop, Richard, Kyle, and Ida Mae	149.00	Montgomery	TV	463
35 . Booker, William - Cedar Grove Farm	442.00	Richmond	ET	471
36 . Bullard Family Partnership	447.10	Pulaski	TV	483
37 . Carter, Wallace - Bondfield Farm	187.50	Lancaster	ET	499
38 . Catlett, Richard H. and Trimble, Terri	69.91	Clarke	LT	511
39 . Chapman, Theodore A. and Renate W.	83.00	Rappahannock	JP	521
40 . Chastain, Inc. (Phillip Reed et al.)	114.00	Goochland	SB	535
41 . Chichester, Dan - Glencairne Farm	79.15	Stafford	ET	551
42 . Claterbaugh Family LP	720.78	Bath	LT	561
43 . Cloverfields Trust	300.00	Albemarle	ET	573
44 . Cobb/Day	181.00	Southampton	BS	587
45 . Coles, Walter and Alice C.	127.33	Pittsylvania	SB	609
46 . Cowles, Dr. Reynolds R, Jr. and Evelyn C.	127.11	Albemarle	SB	621
47 . Cowpasture River, LLC	111.22	Bath	LT	639
48 . Crane, Matthew L. and Suzanne G.	225.00	Greene	SB	651
49 . Crigler, Walter Ronald and Lee Criss	131.44	Madison	SB	665
50 . Crouch, James E. and Margaret F.	92.31	Scott	NK	677
51 . D. W. Tipton Trust	92.00	Scott	NK	685
52 . Delano, Frank	104.77	Westmoreland	ET	693
53 . Dowell - Strawberry Hill Farm	329.92	Albemarle	SB	703
54 . Eastwood Management, LLC	258.46	Fauquier	LG	715
55 . Enochs	490.33	Prince George	BS	729
56 . Estes, Earle W., III and Zorn, Barbara Estes	214.00	Madison	SB	757
57 . Ewald, William and Patricia - The Forest	73.00	Hanover	ET	769
58 . Fairfield Farms, Inc.	450.00	Middlesex	ET	781
59 . Foster, Watt R., Jr. and Jennifer B.	881.50	Campbell	SB	791
60 . Frantz, Lanier	124.67	Craig	TV	801
61 . Gap View Farm, LLC	752.00	Bland/Giles	NK	807
62 . Garnett, Muscoe and Roberta - Elmwood	664.00	Essex	ET	817
63 . Graves Mill Land, LLC A-1	244.76	Madison	SB	829
64 . Graves Mill Land, LLC A-2	251.46	Madison	SB	841
65 . Graves Mill Land, LLC A-3	207.87	Madison	SB	851
66 . Graves Mill Land, LLC A-4	361.44	Madison	SB	861
67 . Graves Mill Land, LLC B	288.00	Madison	SB	871
68 . Graves, Sayre Oxford - Glenarvon	1,371.00	Fluvanna	ET	881
69 . Guy, Jim and Judy	80.00	Warren	LT	911
70 . Harris Hollow, LLC	167.14	Rappahannock	LG	921
71 . Hartman, Lee C., Jr. and Brandemuehl, John W.	71.89	Botetourt	LT	933
72 . Herzog/Herndon	448.00	Craig	TV	941

Easement Proposals

Donor's Name	Acres	County	Staff	Page #
73 . Hoffman, Susan - Belle Meade	130.63	Rappahannock	LG	951
74 . Hollins University Corporation	108.27	Botetourt	LT	965
75 . Houser, Roger	96.52	Page	LT	973
76 . Hudson, Thelma	78.41	Bedford	TV	981

Noon

Lunch

Easement Proposals

Donor's Name	Acres	County	Staff	Page #
77 . Hylander, William and Linda	293.48	Grayson	TV	991
78 . Jeane, Kirkland D. and Amanda M.	50.00	Russell	NK	999
79 . JJM Holdings. LLC	213.78	Rappahannock	LG	1009
80 . Jones, Bill and Gwendolyn	512.80	Spotsylvania	ET	1023
81 . Kavounas, Thomas E.	178.80	Albemarle	SB	1037
82 . Keel, Alton G., Jr. and Lynn M.	128.82	Greene	ET	1047
83 . Keller, W. Blair, Jr., Walter B., III, and Gilda B.	150.00	Washington	NK	1061
84 . Kemper, Talfourd H. and Christine P.	304.00	Bath	LT	1071
85 . Kundrun, Fritz R. and Claudine	282.61	Albemarle	SB	1085
86 . Kuroski, David and Susan - Edgemont	54.11	Powhatan	BS	1107
87 . L & P Land Company, LLC (McNeely)	99.20	Albemarle	ET	1119
88 . Lanier, John L.	123.00	Rockbridge	LT	1133
89 . Legge, Robert D., Judith Sweetland, Christopher	176.00	Madison	SB	1147
90 . Linda Yancy Ingram Revocable Trust	229.88	Culpeper	JP	1157
91 . Little Mountain Ranch (Pritchard)	1,801.67	Highland	LT	1169
92 . Little Parsons Run Land Trust	100.00	Albemarle	SB	1183
93 . Marshall, Daniel W., III and Steven A.	53.32	Pittsylvania	SB	1195
94 . McClung, Anne D.	102.69	Rockbridge	LT	1203
95 . Middlebrook Farms, LLC	242.34	Augusta	LT	1213
96 . Miller, Robert K.	135.00	Montgomery	NK	1223
97 . Morgan, David B.	57.78	Louisa	SB	1237
98 . Murray, James C., II, Trustee	272.20	Albemarle	SB	1247
99 . Nagel, Reid	89.09	Albemarle	SB	1261
100 . O'Connell, Cacci, Wright, and Estes	171.00	Madison	SB	1271
101 . Olinger, Richard R. and Maxine Lamb	627.90	Greene	SB	1283
102 . Owens, Stanley A., Jr. and Margaret E.	157.57	Fauquier	LG	1295
103 . Paschall, Phillip D. and Cox, Elizabeth M.	113.87	Greene	SB	1309
104 . Payne, William and Bonnie	126.04	Rockbridge	LT	1321
105 . Penick, Paul M. and Dandridge T.	280.00	Rockbridge	LT	1335
106 . Persinger-Carter, LLC	386.22	Alleghany	LT	1347
107 . Phemister, James M. and Carol B.	79.05	Rockbridge	LT	1359
108 . Potomac Appalachian Trail Club	222.33	Frederick	LT	1371
109 . Redd, H. Carter - Glencairne	440.00	Hanover	ET	1379
110 . Robinson, Jeannette, et al.	190.00	Bath	LT	1391
111 . Rogers, Joseph M. - Hidden Valley	227.57	Loudoun	LG	1403
112 . Rogers, Joseph M. - Yellowwood	151.12	Loudoun	LG	1415
113 . Severin, R. Keith and Barbara S.	58.25	Fauquier	LG	1427
114 . Shirley Plantation, LLC	121.60	Charles City	BS	1443
115 . Smith, Brian and Peggy	50.00	Giles	TV	1471
116 . Smith, James W. and Lois C. - Haden Loop	162.02	Botetourt	LT	1483
117 . Smith, James W. and Lois C. - Home Farm	191.47	Botetourt	LT	1495
118 . Smith, James W. and Lois C. - River Farm	139.60	Botetourt	LT	1507
119 . Smith, James W. and Lois C. - Woods Island	79.50	Botetourt	LT	1517
120 . Spotts, Mead A.	299.17	Pulaski	TV	1527

Easement Proposals

	Donor's Name	Acres	County	Staff	Page #
121 .	Stallings, Susan - part of Glencairne	168.93	Hanover	ET	1535
122 .	The Wilderness, LLC	730.00	Bath	LT	1547
123 .	Whitmire, Richard B. and Gradison, Robin	55.44	Page	LT	1557
124 .	Whitworth, Chip	158.15	Grayson	TV	1567
125 .	Woodruff, John R. P., II	116.00	Orange	SB	1577
126 .	Woolford, Roger and Stanford, Naomi	80.27	Giles	TV	1587

Closed Session for discussion of personnel and legal matters as provided for in the Code of Virginia §2.2-3711

Appendix T

2002 Virginia Outdoors Plan for
The Northern Shenandoah Valley Regional Commission -
Planning District 7

Region 7: Northern Shenandoah Valley Regional Commission

The Northern Shenandoah Valley Regional Commission encompasses the counties of Clarke, Frederick, Page, Shenandoah and Warren, the City of Winchester, and the towns of Berryville, Boyce, Middletown, Stephens City, Luray, Shenandoah, Stanley, Edinburg, Mount Jackson, New Market, Strasburg, Toms Brook, Woodstock and Front Royal. The region has a landmass of about 1,650 square miles, and the 2000 Census indicated that more than 185,250 people call this area home. Overall, this represents about 16.4% growth during the last decade.



The regional commission encompasses the northwest corner of Virginia that lies between the Blue Ridge Mountains and the eastern slopes of the Appalachians. Massanutten Mountain dominates the heart of the region. The lower sections of the North and South forks of the Shenandoah River crisscross the landscape of the region before converging at Front Royal to create the legendary Shenandoah River. The Shenandoah River in Clarke County is a component of the state Scenic River system. Many of the headwater streams that eventually create the mighty Potomac River rise out of the Appalachians in the southwest section of the district.

The region's economy is driven by a diverse blend of agriculture, tourism, and industry. Since the area was first settled, agriculture has been the mainstay of the Shenandoah Valley. During the Civil War, the Valley was described as the breadbasket of the Confederacy, and more than 300 armed conflicts were waged throughout the area. With the construction of Interstate 81, the Valley began to acquire manufacturing and other industrial interests. During the past 20 years, the Shenandoah Valley and nearby mountain attractions have become popular tourist destinations, generating economic benefits that rival the agricultural and industrial sectors.

CHAPTER IV-G

Within the region, there are about 2,300 acres of state lands and more than 168,400 acres of federal lands available for most types of dispersed recreational use. Due to the vast tracts of forests and national parks, the significant water resources, and the private resorts, the Northern Shenandoah Valley region receives a large influx of recreational users from other parts of Virginia and from outside the state. Collectively, visitors seeking recreational opportunities contribute significantly to the tourism revenue generated in this region.

Skyline Drive, traversing Shenandoah National Park, is among the nation's premier scenic roads. This majestic park and scenic highways attracts tourists from throughout the nation, as well as international visitors. The character of some sections of Skyline Drive has been altered from that of a pastoral scene to landscapes that are sometimes marked by incompatible development. Overlooks that once featured breathtaking vistas of farmsteads or forest are now obscured by haze originating from distant factories, or now reveal factories and expanding suburban residential development. In some cases, subdivisions are being developed within a few hundred feet of this magnificent corridor. As development continues to expand in these sensitive areas near the park, there will be major impacts on the quality of the visitor experience. Those communities that benefit most from the presence of the park with its scenic highways should consider strengthening local comprehensive plans and creating special zoning regulations that will take into account the unique scenic and economic benefits associated with Skyline Drive and its viewshed.

Despite the apparent abundance of certain types of recreational resources, shortages exist for close-to-home facilities that are important to local residents. Needs have been indicated for additional courts and game fields, playgrounds, swimming facilities and other amenities for use by local residents. Existing and projected facility needs for the region are summarized in Table 9, page 215.

The following recommendations could contribute to regional open space and/or recreational opportunities for meeting current and future needs of area residents.

Private sector

The private sector has played a major role in the establishment of the northern Shenandoah Valley as a

tourist destination area. Major resorts such as Massanutten and Bryce have made substantial investments in ski areas, golf courses, pools, campgrounds, lodging and other amenities for the recreating public. Increased interest in the numerous Civil War battlefield sites, many of which are privately owned, has created new opportunities for the heritage-tourism industry. Private-public arrangements and partnerships are evolving to protect, promote, and interpret the significant recreational, cultural and historic resources that are synonymous with the northern Valley. Private enterprise will have the primary responsibility to provide for the increased demand for future amenities throughout the region. The increasing demand for camping, fishing and other on-water activities could prompt private investors to establish recreation and tourism-driven businesses. There is a demonstrated need for additional four-wheel-drive off-road trails in the region. This may present an additional opportunity for the private sector to make use of marginal, undeveloped, private lands to create additional ORV trail opportunities.

Federal facilities

1. In 1997, Congress enacted legislation creating the Shenandoah Valley Battlefield National Historic District (SVBNHD). All the localities within the Northern Shenandoah Valley Regional Commission are included. The legislation authorized a commission whose charge was to develop a plan to promote the protection and continued appreciation of the historic, cultural and natural resources that are associated with the battlefields and are important to the people of the region, the Shenandoah Valley and the nation. The Shenandoah Valley Civil War Battlefields Foundation was also created to serve as a catalyst for implementing the recommendations found in the management plan. The district contains some of the most remarkable and intact Civil War battlefields in the United States. The landscapes of the valley, its natural beauty, farm, small towns and tradition makes it one of the most "characteristically American" regions in the country. More than 325 armed conflicts took place in the eight counties (including Highland, Rockingham and Augusta counties plus cities and towns in PDC 6) that comprise the SVBNHD and lay at the heart of the struggle. According to the management plan, about 70% of the core areas identified in the management plan retain their original integrity, while only about 7% of those areas are in some way protected.

Today the district remains a vital, yet vulnerable national resource. The management plan recommends a 20-year implementation process. However, all the partners should strive to initiate the critical resource protection strategies quickly, before the key resources are compromised by development pressures.

The SVBNHD Management Plan outlines a program to preserve the districts historical character, protect and interpret the Civil War battlefields and related resources, and increase the public's awareness of the war's legacy in the Valley. The plan contains dozens of recommendations for protecting fragile resources, providing visitor information services, interpreting activities that occurred on a particular site, and identifying battlefield tour routes that would enable the visitor to travel among the planned visitor service centers.

2. **The George Washington and Jefferson National Forests:** Revised Land and Resource Management Plan identifies additional resources necessary to support the existing demand for dispersed recreational opportunities in the forest. The revised goals and objectives call for the forest to operate with a more balanced approach — open space, conservation and recreation having equal weight with other forest activities. Additional facilities called for by the forest plan include trails, camping, water access, natural resource interpretation and environmental education. These resources will result in new and improved recreational facilities for forest visitors. There is an identified need for additional four-wheel-drive off-road vehicle trails on all public lands throughout the region.

3. Within this region, the North Fork of the Shenandoah, the South Fork of the Shenandoah, Cedar Creek, and two segments of Passage Creek were identified in the U.S.D.A. Forest Service's Revised Land and Resource Management Plan as eligible for study for federal Wild and Scenic River designation. Should this process proceed, the Virginia Department of Conservation and Recreation will work with the Forest Service to determine if these rivers should be designated.

4. **Shenandoah National Park:** In 1999 the park's attendance exceeded 1.3 million visitors, taxing some of the resources during peak periods in the prime recreational season. Overcrowding here, as in other National Park Service units, has led to overutilized resources and user conflicts. The staff is considering

several infrastructure improvements to existing areas within the park. It is also dealing with a number of significant threats to the health of the park's environment. Outbreaks of diseases or infestation by insects, including the gypsy moth, the dogwood *Anthraxnose*, and the southern pine beetle are decimating large tracts of valuable forestland. Problems associated with certain wildlife species overpopulation, such as the white tail deer, and the loss of scenic vistas due to declining air quality need to be addressed. Congress fixed the park at its present size, precluding adjustments to the park boundary and preventing the resolution of some land-use conflicts at the park boundaries. All of these factors could significantly impact the availability and quality of recreational resources for future park visitors. The park's revised Resource Management Plans contain strategies for addressing these issues.

5. Local governments are beginning to recognize the value of viewsheds as an enhancement to their quality-of-life as well as an asset that turns local attractions into tourist destinations. Scenic overlays for the Shenandoah Valley National Battlefield Historic District, the Shenandoah National Park and George Washington and Jefferson National Forests should be considered as part of a multiregional viewshed planning process.

6. **The Appalachian Trail** skirts the edge of the region along the crest of the Blue Ridge Mountains within the Shenandoah National Park and must deal with the same issues as those that confront the park. In addition, the Appalachian Trail frequently experiences overcrowding in some areas. Consideration should be given for ways to disperse the use of this resource and to balance conflicting uses and needs.

7. **The Conservation and Research Center** near Front Royal contains several thousand acres and is operated by the Smithsonian Institution's National Zoological Park. Activities at the center focus on biodiversity conservation through programs in research, national and international training, and captive breeding of endangered species. The Conservation and Research Center is closed to the general public; however, conference facilities are available for use by outside groups on a fee basis. Localities could take advantage of the unique meeting facilities available at the center.

State parks

Projects identified in approved master plans need to be funded. State park master plans must be revisited by DCR staff every five years; any significant changes not identified in the current, approved master plan, or improvements/additions costing in excess of \$500,000, must go through the public participation process.

8. Land acquisition and initial infrastructure developments at the **Raymond R. “Andy Guest” Jr. Shenandoah River State Park** that were called for in the 1992 bond referendum issue have been completed. A master plan for the park was approved in March 2001, which calls for camping, cabins, an extensive trails network, a visitor center and environmental educational facilities, as well as enhanced access to the river.

9. The **Seven Bends Area of the North Fork of the Shenandoah River** in Shenandoah County has beautiful scenery and excellent fishing and canoeing in a pristine setting. The area could provide a rare opportunity for the acquisition and development of a multipurpose river park that could contain significant historic and natural features, and would afford easy access to import resources of the region, including several near-by battlefields. This site would provide an excellent opportunity to serve the conservation, recreation and environmental education needs of the region.

Natural areas

The Department of Conservation and Recreation has, as of March 2001, documented 422 occurrences of 165 rare species and natural communities in the Northern Shenandoah Valley Regional Commission. Twenty-one species are globally rare and five are federally threatened or endangered. Fifty-three conservation sites have been identified in the district; 39 (74%) have received some level of protection through ownership or management by state, federal and nongovernment organizations.

DCR recommends that the 14 unprotected conservation sites be targeted for future protection efforts. The appropriate method of protection will vary with each site but may include placing the site on Virginia's Registry of Natural Areas, developing a voluntary management agreement with the landowner, securing a conservation easement through a local land trust, acquiring the site through a locality or local land trust, dedicating the site as a natural area preserve with the

current owner, or acquiring the site as a state natural area preserve. For a discussion of the Natural Heritage Program, see Chapter III-B-2-d on page 133.

Other state properties

10. **Blandy Farm and State Arboretum** in Clarke County houses the State Arboretum of Virginia on more than 150 acres. Local visitors and tourists alike hail the Blandy Farm for the quality experience and memorable visit that they have there. Plans have been developed for an information and visitors, center, an amphitheater, picnic facilities, gardens and garden walks accessible for persons with disabilities.

11. The **Northern Virginia 4-H Center**, located in Warren County, has numerous trails and other facilities that are used by others, including hikers on the nearby Appalachian Trail. There may be an opportunity to develop a cooperative agreement among groups, which will expand offerings for all users.

Public fish and game management

12. The Virginia Department of Game and Inland Fisheries should establish a state fish and game management area on the **Shenandoah River** to serve the conservation and recreation needs of the region.

13. As the primary agency responsible for providing boating access to the public waters of the Commonwealth, **DGIF** should coordinate with all land managers and user groups to identify locations and help to develop additional access sites that are needed on the free flowing streams of the region.

Regional parks and other resources

14. Shenandoah County has received funds to purchase a 150-acre parcel near the confluence of the North Fork of the Shenandoah River and Cedar Creek. The critical location on the river and in close proximity to the national forest will give the park a regional significance that can support a variety of recreational opportunities for the people of the area. Shenandoah County should initiate the design and development process as soon as the resources can be identified.

15. The **Avtex Fibers Plant** is a Superfund site on the Shenandoah River at Front Royal. It is being redeveloped into a “green” industrial park. A recreational park, **Conservancy Park** is part of the site rehabilitation and consists of almost 350 acres fronting the river.

Park developments will include access to the river, restroom facilities, picnic areas, natural areas and open space, a trails network and a variety of other day-use activities, including soccer fields. Conservancy Park could help address issues identified in the recreational use management plan (see #17). Funding should be made available as part of the mitigation plan and the site should be developed as an early phase of the rehabilitation, which could be completed in five to seven years.

Public water access

The Demand-Supply-Needs analysis also points to a critical need for increased access to the public waters of the district for all types of water-based activities. Access considerations for the region include the following:

16. Additional public access is needed to all the major streams of the region, including both the North and South forks and the main stem of the **Shenandoah River**, **Passage Creek** and **Cedar Creek**. Where appropriate, portages should be created around dams and other river obstacles.

17. A multi-objective river recreation plan has been prepared to address recreation and water resource management issues for the South Fork and Main Stem of the Shenandoah River in Page, Clarke and Warren counties. The plan, developed by an advisory committee composed of farmers, outfitters, other riparian owners, local government, DCR, DGIF, USFS and others, contains numerous recommendations for managing the recreational use on the river while protecting the resource. Recommendations of that plan should be implemented quickly. Other communities should consider the findings and recommendations of this plan as a model for implementing management strategies on other heavily used river segments.

Scenic Rivers

The following river segment has been evaluated and determined to qualify for Virginia Scenic River designation:

18. The North Fork of the Shenandoah River from Burnshire Bridge to Route 648 in Front Royal.

The following river segments should be evaluated to determine their suitability as Virginia Scenic Rivers:

19. The South Fork of the Shenandoah River in Page and Warren counties from Port Republic to Route 684, and from Overall to Front Royal.

20. The North Fork of the Shenandoah River in Shenandoah and Warren counties from New Market to Burnshire Bridge.

21. Cedar Creek in Shenandoah, Frederick and Warren counties — the entire stream.

Scenic highways and Virginia Byways

There has also been a tremendous interest in thematic trails including, Civil War trails, the Wilderness Road Trail, the Birding and Wildlife Trails, the Revolutionary War trails, the African-American Heritage Trail system, and other driving tour routes. Within the planning district, Shenandoah Valley Battlefields tour route and the Wilderness Road Trail are regional driving trails that should be considered. The next logical step after the *Scenic Roads in Virginia* map would be to develop a series of regional maps or booklets that describe and help locate the resources and services found in all sections of the state. The following roads have been recommended for consideration as Virginia Byways:

22. **Route 42** from near Edinburg in Shenandoah County to near Harrisonburg in Rockingham County, as well as the section south of Harrisonburg to the Augusta County line.

23. **Route 678** in Shenandoah County between Route 211 and Route 55 near Strasburg.

Trails and greenways

Local and regionally initiated trail and greenway planning is important for identifying and providing communities with these resources. The Department of Conservation and Recreation recommends that each locality develop a trail and greenway plan as part of its comprehensive plan. This plan should strive to link existing and proposed trails and greenways into a regional greenways network connecting existing and proposed recreational, natural, cultural, water, business/commercial and other resources the community deems desirable.

Local governments should also develop comprehensive bicycle plans as a component of their transportation plans. The Virginia Department of Transportation can include funds for bike trail construction projects only if the bikeway plan is included in the locality's approved transportation plan.

The following are greenway/trail proposals for this region:

24. A private conservation organization is attempting to purchase the **Norfolk Southern Railway** in Shenandoah County for the purpose of operating an historic steam excursion train. This facility, if developed, could provide a combination recreation/tourism facility that could become a tourist destination for the northern Valley. Additional funding is needed in order to complete the plan as proposed in the recent feasibility study.

25. The **Tuscarora Trail** (formerly the Big Blue) crosses Shenandoah and Frederick counties. Although the trail is in place, efforts should continue to relocate the trail corridor off the public roads and provide additional protection for the relocated sections.

26. A greenway should be developed along the **Shenandoah River** to connect the state park with other resources.

PD 7



Table 9
Existing and Projected Needs
Northern Shenandoah Valley (PD #7)

ACTIVITY	ACTIVITY DAYS	DEMAND	UNITS	TOTAL SUPPLY	PRIVATE SUPPLY	2000 NEEDS	2010 DEMAND	2010 NEEDS
Baseball	361,300	71	fields	39	4	32	82	43
Basketball	655,898	156	goals	61	10	95	180	119
Bicycling	1,673,096	119	miles	NI			137	
Lake, River, Bay Use (combined)	1,110,210	13,596	water acres	576		13,020	15,702	15,126
Power Boating	250,131	6,029	water acres	S			6,963	
Sailing	170,459	1,475	water acres	S			1,704	
Lake Fishing	536,577	3,018	water acres	S			3,486	
Salt Water Fishing	34,462	194	water acres	S			224	
Jet Ski/ Personal Watercraft (PWC)	53,361	836	water acres	S			965	
Water Skiing / Towed on Water	65,219	2,044	water acres	S			2,360	
Camping (*)	495,444	2,922	sites	3,210		-288	3,374	164
Tent camping	140,073	826	sites	416	63	410	954	538
Developed camping	355,371	2,096	sites	2,794	1,942	-698	2,420	-374
Fitness Trail use	57,437	5	mile trails	10	1	-5	5	-5
Fields (combined)	367,785	77	fields	47	3	30	89	42
Football	141,741	30	fields	NS			34	
Soccer	226,044	48	fields	NS			55	
Stream Use (combined)	684,988	410	stream miles	348		62	473	125
Stream Fishing	536,577	377	stream miles	S			436	
Human-powered boating	97,273	25	stream miles	S			29	
Rafting	22,234	4	stream miles	S			5	
Tubing	28,904	4	stream miles	S			4	
Golfing	646,264	22	courses	12	12	10	25	14
Hiking/ Backpacking	433,560	222	trail miles	474	133	-252	257	-217
Horseback Riding	77,818	34	miles	211	36	-177	39	-172
In-Line Skating	51,879	4	miles	NI			4	
Jogging/Running	1,324,766	106	mile trails	NI			123	

S - same as combined NS - not inventoried separately NI - not inventoried (-) - indicates surplus

* - 79.6 % of 2000 Virginia Outdoor Survey respondents preferred developed campsites

20.4 % of 2000 Virginia Outdoor Survey respondents preferred primitive campsites

Note: Demand multipliers used to create this chart are based on the findings of the Virginia Outdoors Survey as measured at the regional level. In regions with significant contrasts in population density and demographics, need results may show surpluses where none exist, especially in sparsely populated counties. Additional analysis will be required to adjust these results to local conditions.

**Existing and Projected Needs
Northern Shenandoah Valley (PD #7) Continued**

ACTIVITY	ACTIVITY DAYS	DEMAND	UNITS	TOTAL SUPPLY	PRIVATE SUPPLY	2000 NEEDS	2010 DEMAND	2010 NEEDS
Nature Study/ Programs	62,255	9	sites	2		7	10	8
Picnicking Away from Home	329,802	856	tables	2,657	435	-1,801	989	-1,668
Skateboarding	50,026	15	sites	NI			18	
Snow Skiing or Snowboarding	75,595	2	ski lifts	3	3	-1	2	-1
Softball	348,330	62	fields	63	4	-1	72	9
Sunbathing/ Relaxing on Beach	452,644	32	beach acres	17	12	15	37	20
Swimming Outdoor Area	315,721	32	beach acres	17		15	37	20
Swimming Outdoor Pools	434,486	18	pools	33	23	-15	21	-12
Swimming Indoor Pools	150,449	2	pools	2	0	0	2	0
Tennis	231,603	145	courts	96	31	49	167	71
Used a Playground	600,314	85	sites	83	12	2	99	16
Visiting Gardens	51,138	6	sites	NI			6	
Visiting Historic Sites	252,725	21	sites	NI			25	
Visiting Natural Areas	240,867	41	sites	NI			47	
Volleyball	47,247	14	courts	13	2	1	16	3
Went Hunting	440,971	72,315	acres	106,513		-34,198	83,517	-22,996
Went Shooting Total	332,025	188	fields	NI			217	
Target	147,484	83	fields	NI			96	
Skeet or Trap	75,595	43	fields	3		40	49	46
Other	37,056	21	fields	NI			24	
Drive for Pleasure	1,809,279	na	na	NI			na	
Motorcycle/ATV (combined)	165,827	76	miles	19	0	57	87	68
Driving All-Terrain Vehicle	118,580	54	miles	NS			63	
Driving Motorcycle Off-Road	47,247	22	miles	NS			25	
Driving 4-Wheel-Drive Off-Road	125,621	na	na	NI			na	
Walking for Pleasure	5,567,724	na	na	NI			na	
Other	125,992	na	na	NI			na	

S - same as combined NS - not inventoried separately NI - not inventoried (-) - indicates surplus

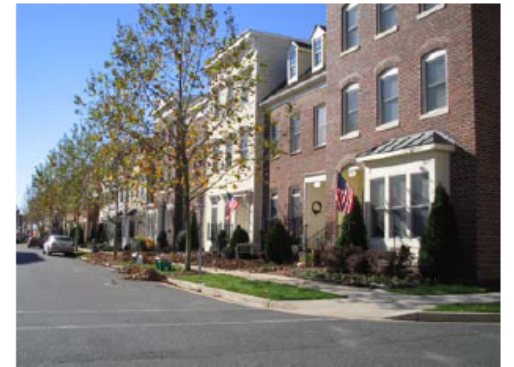
Appendix U

Frederick County Urban Development Area Study
Fact Sheet and Land Use Policy Proposal Cover Letter

UDA Study

UDA Study - Statement of Intent.

The UDA Study will address the 21st century needs of the urbanizing areas of Frederick County. The study shall identify planning and development principles to affect a land use plan that is proactive and creative, that will meet growth demands, assure a sustainable community, and maintain a high quality of life for the citizens of Frederick County.



UDA Study

Proposed Land Use Policy Review:

Urban Development Area

Accommodates anticipated community growth
in an urban environment

Increase in overall residential density in UDA

Efficiency in providing community facilities

**A new
form of
development
for the
UDA**

“Creating Community in the Urban Development Area”.

Diverse and vibrant

Appealing and functional

Placemaking

Provides a high standard of living for broad cross section of the community

UDA Study

Proposed Land Use Policy Review:

Neighborhood Mixed Use Urban Community Centers

A new philosophy of development that creates neighborhoods which incorporate residential, retail, educational, and public uses, commercial services, opportunity for employment, and institutional and recreational resources.

Integrating...

Neighborhood Residential Land Uses
Neighborhood Commercial Land Uses
Public and Institutional Land Uses
Planned Communities

Guided by...

Development Principles

Mix and integration of a variety of uses
Mix and diversity of housing opportunities
Community focal points
Density in an urban form

Connectivity, walkability and mobility
Integrated Community Facilities
Open spaces
Environmental sustainability
Enhanced design and planning
“Creation of a sense of place”



MEMORANDUM

TO: Planning Commission

FROM: Michael T. Ruddy, AICP 
Deputy Director

RE: Discussion; UDA Study – Land Use Proposal for the Comprehensive Plan and
Accompanying Planning Area Analysis.

DATE: October 5, 2006

Enclosed for the Planning Commission's review and discussion is the Urban Areas Land Use Proposal for the Comprehensive Plan. The UDA Working Group and Comprehensive Plans and Programs Subcommittee have been working over recent weeks to finalize the proposal based upon input and discussion from the Joint Work Session held with the Board of Supervisors on August 29, 2006.

In summary, the proposed land use policy and principles promoted by the UDA Study for the urban areas of the County enables a proactive and creative land use plan that will meet growth demands, assure a sustainable community, and maintain a high quality of life for its citizens. The improved land use plan promotes and enables a new pattern of land use for the urban areas of the Frederick County that would be applicable within the UDA, and in identified areas adjacent to the UDA.

The Land Use Proposal for the Urban Areas is based upon *Creating Community in the Urban Areas* and the following:

Development Principles in the Urban Areas

New Urbanism and Traditional Neighborhood Design methods are envisioned to be an effective tool for growth management of the County's urban areas. Future land uses and new development within the County will be generally based upon the following principles: Mix and integration of a variety of uses, Mix and diversity of housing opportunities, Increased density in an urban form, Walkability, Connectivity, Traditional neighborhood structure, High quality architecture and urban design, Sustainability and environmental quality, Smart transportation, Integrated community facilities, Community focal points, and Enhanced design and planning.

Neighborhood Villages and Urban Centers

Envisioned throughout the urban areas of the County is a new philosophy of development that creates neighborhoods which incorporate residential, retail, educational, and public uses, commercial services, opportunities for employment, and institutional and recreational resources. Neighborhood Villages and Urban Centers would be the building blocks of the urban fabric of Frederick County's urban areas.

The land use concept of the Neighborhood Villages and Urban Centers would enable land owners and the County the opportunity to choose an appropriate development style and form that would add long term value to the community. This choice is in addition to the land use concepts presently identified in the Comprehensive Plan. Potential Neighborhood Village and Urban Center Locations have been identified.

Neighborhood Villages

Neighborhood Villages are envisioned to be compact centers that focus and complement the surrounding neighborhoods, are walkable and designed at a human scale, and which are supported by existing and planned road networks.

Urban Centers

The Urban Center is larger than the Neighborhood Village and is envisioned to be a more intensive, walkable urban area with a larger commercial core, higher densities, and be designed around some form of public space or focal point. Urban Centers should be located in close proximity to major transportation infrastructure.

Community Facilities in the Urban Areas

Community facilities, in particular schools and their locations, have tremendous effect on how our communities grow. There is an opportunity to improve the quality of the community and schools together by applying contemporary planning principles to community facility planning. In general, an important theme of this land use approach is that community facilities should serve as the focal point for Neighborhood Villages and Urban Centers and the urban areas. Community centered schools are aimed at promoting more livable places and improving the overall educational experience. In general, the community should place a greater emphasis on joint use of facilities for a variety of entities and uses. The importance of community connectivity is recognized. There is a need to provide linkages between trails, parks, opens spaces and community uses.

Transportation in the Urban Areas

The Neighborhood Villages and Urban Centers are based on the premise of walkable, pedestrian orientated urban communities. In general, the County's transportation network should be designed for connectivity. Streets within the neighborhood should provide a connected network, offering a variety of routes and dispersing traffic. Transportation improvements should be designed as public spaces with multimodal opportunities that promote traffic safety and reduce congestion.

The County should continue to ensure that the Community's transportation planning efforts promote a multimodal transportation plan that addresses existing and future transportation needs of the County and the Win-Fred MPO area. This regional planning effort is supplemented by the County's Eastern Road Plan, a tool that enhances the level of planning, detail, and design of the needed transportation improvements of the community. The Bicycle and Pedestrian Mobility Plan effort should be used as a tool that enhances the community's walkability and generally improves the multimodal accommodations available to the community. In general, walkable, pedestrian orientated human scale urban communities are encouraged.

Green Infrastructure in the Urban Areas

The Green Infrastructure includes those features that enrich the quality of life and are necessary for the protection of clean air, water, and natural resources, and will serve as the central organizing concept for future land use in both the urban areas.

Also enclosed for the Planning Commission's information is a Planning Area Analysis of the County's urban areas. This analysis was developed during the UDA Study as a tool to monitor planning activity and understand the build-out potential of the County's urban areas. The Planning Area Analysis is generally based upon magisterial districts and sub-planning areas within each district. The more detailed sub-planning areas provide the basis to understand the land use details within specific areas of the urban community. When combined together, they provide an improved picture of the urban areas of the County. The Planning Area Analysis is intended to be a working document and will continue to be enhanced with additional information.

This item is for the Planning Commission's discussion. Comments received from the Planning Commission will be incorporated into the proposal and forwarded to the Board of Supervisors as a discussion item at their November meeting.

Appendix V

Mid-Atlantic Clean Diesel Project List



Mid-Atlantic Air Protection

Serving Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia

Mid-Atlantic Clean Diesel Project List as of 11/15/2006

ID	STATE	PROJECT RECIPIENT	TYPE(S) OF VEHICLE	TECH.	FUEL TYPE
400	DC	District of Columbia		IP	
47	DC	Washington Metropolitan Area Transit Authority (WMATA)	transit shuttle buses	DPFS	ULSD
357	DC	Washington Metropolitan Area Transit Authority (WMATA)	transit shuttle buses	DPFS	ULSD
356	DC	Washington Metropolitan Area Transit Authority (WMATA)	transit shuttle buses	EGR	
352	DE	Christiania School District			BIOD
350	DE	Indian River Marina	port equipment		BIOD
351	DE	Department of Transportation	hwy. maint. Vehicles		BIOD
557	DE	Delaware Area Regional Transit (DART)	transit shuttle buses	RPLC	ULSD
403	DE	Delaware Department of Natural Resources and Environmental Control		IP	
462	MD	Maryland Transit Administration (MTA)	transit shuttle buses		
288	MD	Maryland Department of Environment (MDE) & Baltimore Fire Department	state/county/city vehicles	DOCS CCR	
845	MD	Montgomery County Fire and REscue Service	state/county/city vehicles	DOCS	
844	MD	City of Annapolis	other nonroad vehicles	DOCS	
402	MD	Maryland Department of Environment		IP	
304	MD	Maryland Department of the Environment (MDE)	transit shuttle buses hwy. maint. vehicles other onroad vehicles	DOCS CCR	
354	MD	Maryland Department of Transportation (MDOT) & IdleAire		TSE	
51	MD	Maryland Department of the Environment (MDE)	transit shuttle buses		ULSD
668	MD	MDE- city of Baltimore	state/county/city vehicles other nonroad vehicles	DOCS	
66	MD	Anne Arundel County School District	school buses	DOCS CCR	
65	MD	Prince George's County School District	school buses	DOCS OTHR	
64	MD	Montgomery County School District	school buses	DOCS OTHR	

546	PA	Penn Hills School District	school buses	DOCS	ULSD
380	PA	Clean Air Council/Port of Philadelphia			
363	PA	Valley Forge National Park	other onroad vehicles		BIOD
361	PA	Pennsylvania Turnpike Commission	other onroad vehicles		CNG
48	PA	North Allegheny School District	school buses	DOCS	ULSD
359	PA	Clean Air Council - Philadelphia		IP	
358	PA	North Penn School District	school buses	DOCS	ULSD
50	PA	General McLane School District	school buses	DOCS	
843	PA	Allegheny County School Districts		DOCS DPFS CCR	
53	PA	Philadelphia County School District - Widener Garage.	school buses	DOCS	ULSD
852	PA	Greater Philadelphia Clean Cities			
347	PA	Upper Darby School District	school buses	DOCS DPFS	ULSD
68	PA	Coca-Cola Enterprises, Inc. - Harrisburg install clean diesel technologies purifier catalyst and use fuel borne catalyst also.	Trucks	DOCS FBC	
69	PA	City of Philadelphia, Divisions of Water and Waste Management	state/county/city vehicles	DOCS	
70	PA	Waste Management, Inc. - Gilbertsville, PA.	state/county/city vehicles	DOCS	
362	PA	Willow Grove Naval Airforce Base	other onroad vehicles		BIOD
718	PA	Amtrack - Philadelphia	other nonroad vehicles	DOCS	
52	PA	Wissahickon School District	school buses	DOCS DPFS	ULSD
556	PA	Allegheny County		IP	
719	PA	SPC/Camden Iron and Metal	other nonroad vehicles	DOCS RPLC	
664	PA	Idle Aire		TSE	
663	PA	Idle Air		TSE	
581	PA	Chester County Intermediate Unit	school buses	DPFS	ULSD
580	PA	Great Valley School District	school buses	DPFS	ULSD
577	PA	Plum Borough School District	school buses	DPFS	ULSD
566	PA	Philadelphia Clean Air Council- Port project	port equipment	DPFS	
562	PA	SEPTA	transit shuttle buses	DPFS	
561	PA	SPC Corp.	other nonroad vehicles trucks	DOCS OTHR	
360	PA	Pennsylvania Turnpike Commission	hwy. maint. vehicles other onroad vehicles		BIOD
564	PA	MARAMA	Trucks	APU	
401	PA	Philadelphia Air Management Association		IP	
552	PA	Philadelphia Asthma Busters	commuter tourist trollies	DOCS	

551	PA	Allegheny County Health Department		IP	
463	PA	West Chester School District	school buses	DPFS OTHR	ULSD
458	PA	IdleAire Technologies		TSE	
471	PA	City of Philadelphia, Fleet Management	state/county/city vehicles		
460	VA	Rockingham County Schools	school buses	DOCS	
720	VA	City of Richmond/City of Hopewell School Districts. Clean School Bus USA grant recipients 2005.	school buses	DOCS OTHR	
56	VA	Roanoke County School District	school buses	DOCS	
57	VA	Roanoke City School District	school buses	DOCS	
58	VA	Frederick County School District	school buses	DOCS	
59	VA	Henrico County School District	school buses	DOCS	
60	VA	Fairfax County School District	school buses	DOCS	
61	VA	Winchester City School District	school buses	DOCS	
62	VA	City of Virginia Beach & City of Norfolk Public School Districts	school buses		CNG
560	VA	Loudoun County School District	school buses	DOCS	
567	VA	Virginia Port Authority	port equipment	DOCS RPLC OTHR	
547	VA	Norfolk City Schools	school buses	DOCS	
549	VA	Winchester County Schools	school buses	DOCS	
349	VA	Fairfax County, VA	transit shuttle buses	DPFS EGR ASD IP	ULSD
348	VA	Fairfax County, VA	state/county/city vehicles other onroad vehicles	DOCS	
548	VA	Virginia Beach Schools	school buses	DOCS	
553	VA	Virginia Port Authority in Hampton Roads.	other onroad vehicles port equipment	DOCS RPLC	CNG
550	VA	Loudon County	school buses	DOCS OTHR	
555	VA	Virginia Port Authority		IP	
461	VA	Harrisonburg City	school buses transit shuttle buses	DOCS	
558	VA	Harrison City	transit shuttle buses	DOCS	
582	VA	fairfax county transit - Connector Bus system	transit shuttle buses	DPFS EGR ASD IP	ULSD
404	VA	Virginia Department of Environmental Quality		IP	

565	VA	VADEQ			OTHR	
554	VA	Virginia Port Authority	port equipment		IP	
667	WV	New Century Truckload Services Group Martinsburg County	Trucks		APU ASD	
666	WV	Jefferson County	Trucks			BIOD
665	WV	City of Martinsburg			IP	
545	WV	Jefferson County Schools	school buses		DOCS	BIOD
464	WV	Jefferson County Schools				BIOD
63	WV	Berkeley County Schools	school buses		DOCS	BIOD

Total Projects = 88

Last updated on Wednesday, November 15th, 2006.

<http://www.epa.gov/reg3artd/diesel/r3projects.htm>



Ozone Early Action Plan

Northern Shenandoah Valley

Northern Shenandoah Valley Ozone Early Action Area

State Air Quality & Program Update

December 31, 2006



TABLE OF CONTENTS

1.	INTRODUCTION	3
2.	AIR QUALITY UPDATE	3
3.	EMISSIONS INVENTORY UPDATE	7
4.	REGIONAL/STATE PROGRAMS UPDATE	8
5.	CONTROL PROGRAM & MEASURES SUMMARY	12

LIST OF APPENDICES

APPENDIX – Control Program and Measures Summary

Northern Shenandoah Valley Ozone Early Action Plan State Air Quality & Program Update – December 31, 2006

Introduction

Provided in this report is a status of the state efforts to assist the Northern Shenandoah Valley (Winchester) Ozone Early Action Compact (EAC) Area in implementing 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 Winchester 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
- Preliminary 2006 emissions inventory demonstrating continued progress towards 2007 emissions reduction and attainment goals.
- Implementation of regional and state programs contributing to the EAP process.
- Summary and status of control measures implemented as part of the Winchester EAP.

Air Quality Update

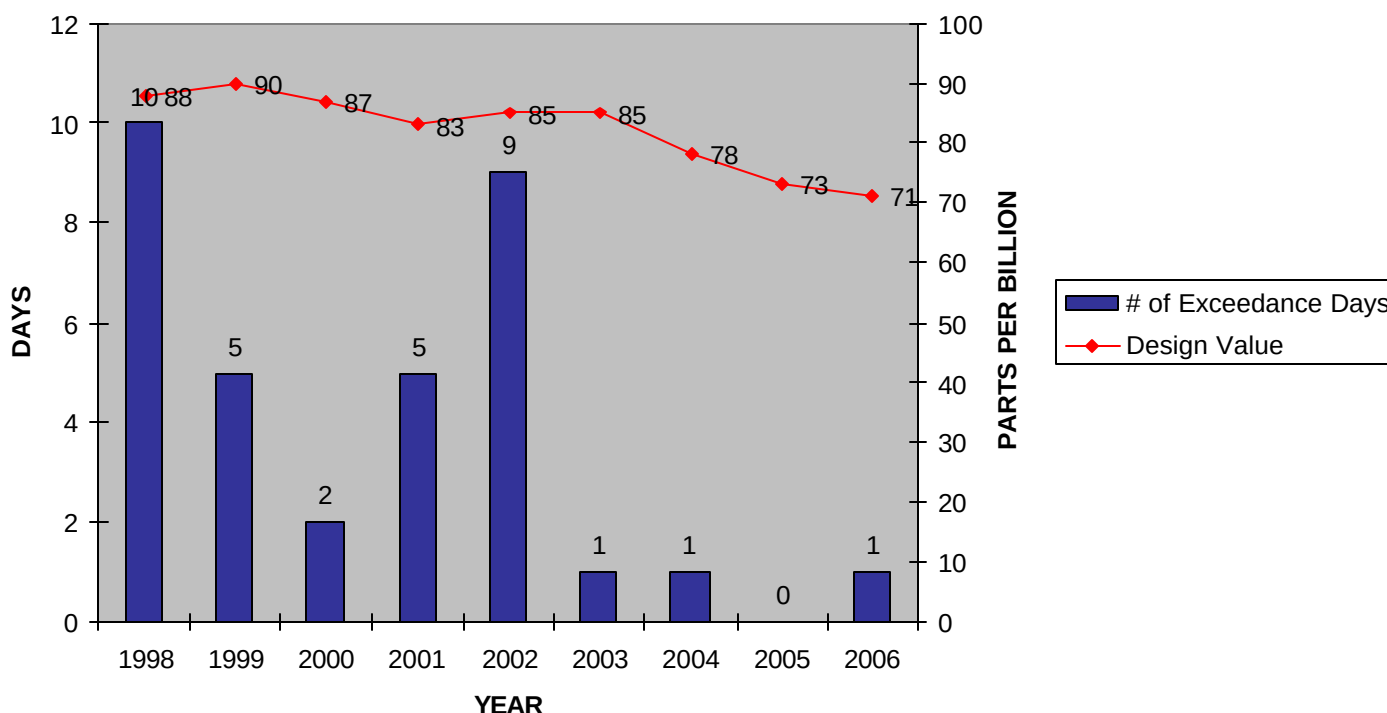
As 2006 comes to a close, air quality continues to improve in the Winchester area. This is demonstrated by the fact that the area has recorded only 3 exceedances of the 8-hour ozone standard since 2003. The improvement of air quality continued in 2005 despite weather more conducive to ozone formation than in previous years. This trend in air quality improvement is documented below from highs recorded in the late 1990s. As a result, the Winchester area is now in compliance with the 8-hour ozone standard. One exceedance of the standard was recorded in the during the 2006 ozone season. However, the design value for Winchester continues to drop to 71 parts per billion in 2006. Please note that the 2006 ozone season data presented in this report has not yet been officially certified and submitted to EPA.

Table 1 – Winchester Area Ozone Trends

YEAR	# OF EXCEEDANCE	3-YEAR DESIGN VALUE
1998	10	88 Parts Per Billion (PPB)
1999	5	90 PPB
2000	2	87 PPB
2001	5	83 PPB
2002	9	85 PPB
2003	1	85 PPB
2004	1	78 PPB
2005	0	73 PPB
2006*	1*	71 PPB*

*** 2006 data has not yet been certified and submitted to EPA**

Figure 1 – Winchester Area Ozone Trends

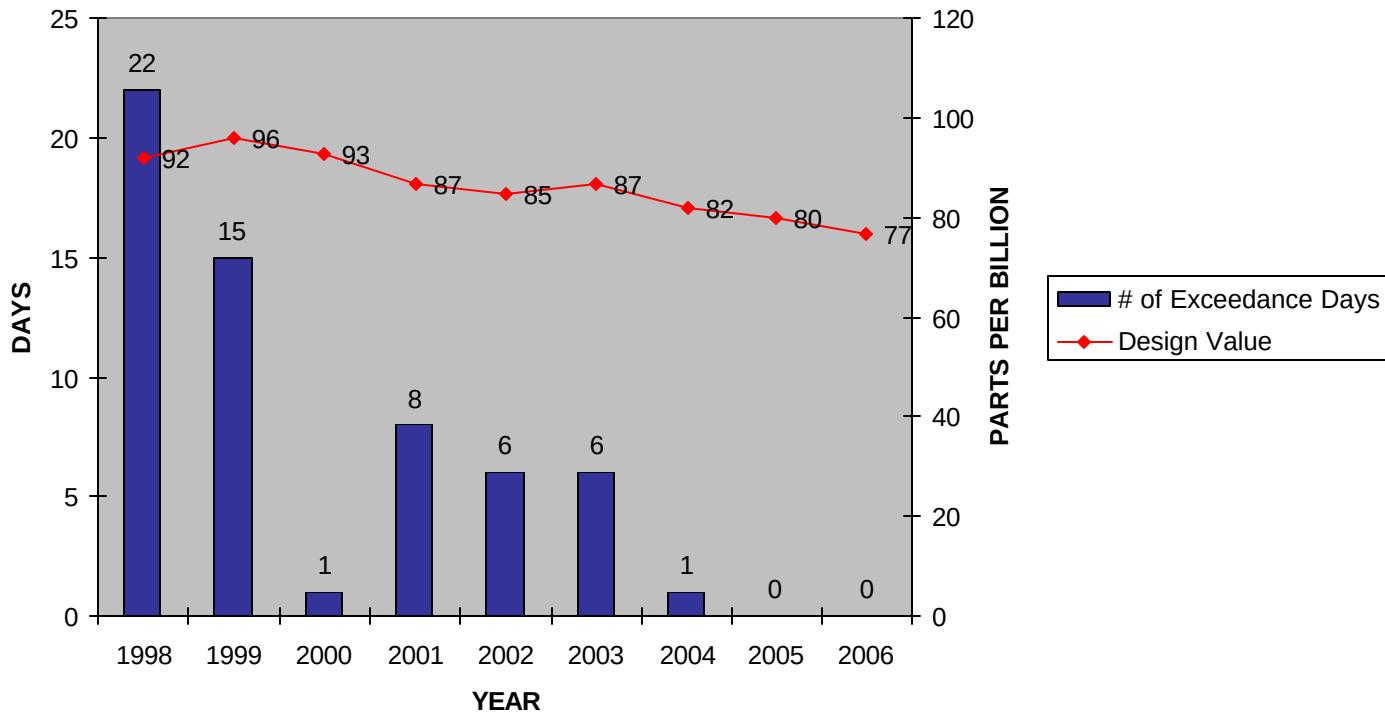


Of equal or even more importance than the local ozone air quality improvement in the Winchester is the trends being observed in the reduction of ozone being transported in to Virginia and the EAC areas. Small areas like Roanoke and Winchester, with relatively small local ozone precursor pollutant emissions 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.

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 in the graph below, ozone air quality has also improved significantly at the SNP monitor. Again, the 2006 data is unofficial.

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



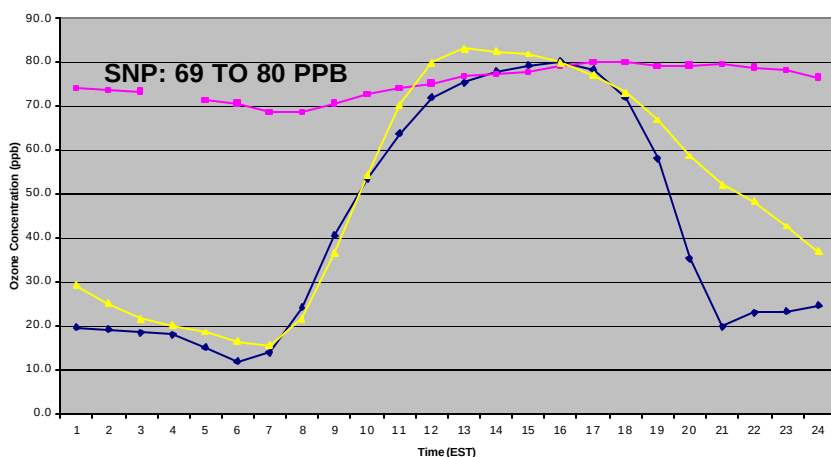
To investigate this reduction in transported pollution, the following analysis was performed. The table and charts presented below and on the next page show that the average ozone levels measured at Big Meadows during ozone exceedance days has dropped from 1998 to 2005 by approximately 15 ppb.

Table 2 – Range of Big Meadows Hourly Average Concentrations

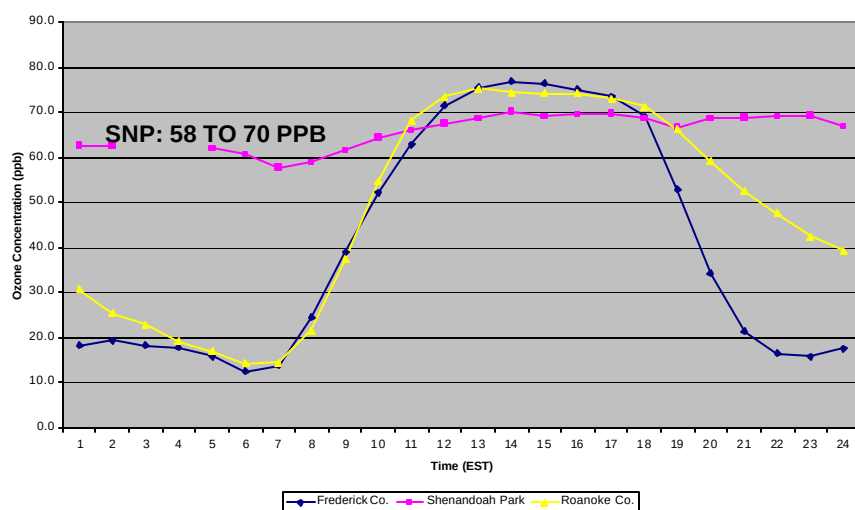
YEAR	AVERAGE CONCENTRATION RANGES
1998	69 TO 80 PPB
1999	65 TO 76 PPB
2000	67 TO 74 PPB
2001	68 TO 75 PPB
2002	58 TO 70 PPB
2003	70 TO 77 PPB
2004	56 TO 69 PPB
2005	54 TO 63 PPB

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

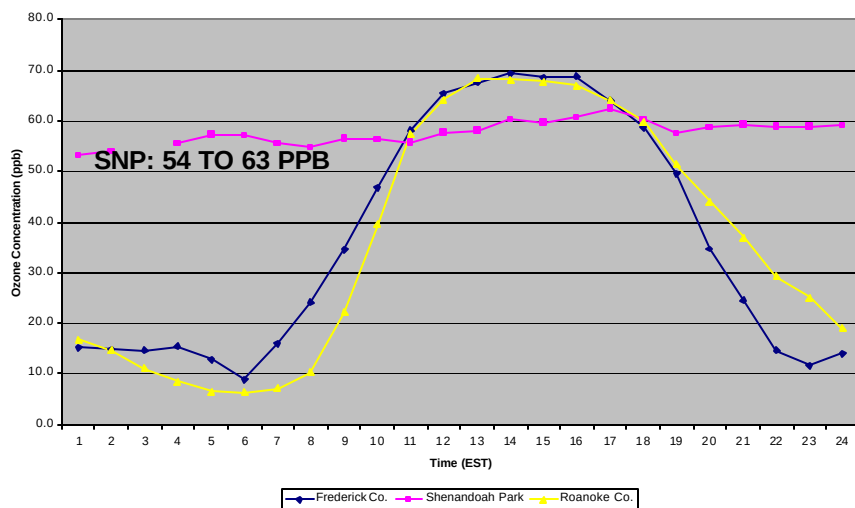
Hourly Ozone Concentration (1998 8-hr Exceedance Days)



Hourly Ozone Concentration (2002 8-hr Exceedance Days)



Hourly Ozone Concentration (2005 8-hr Exceedance Days)



This reduction in the regional ozone load is most likely due to the numerous 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. This analysis of transport will be updated to 2006 once the final data becomes available.

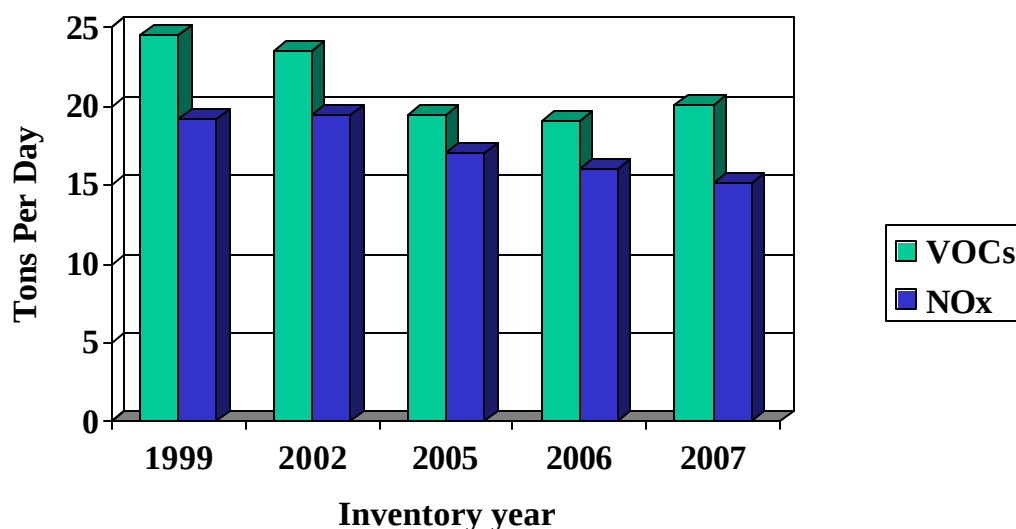
Emissions Inventory Update

To demonstrate that the Winchester 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 for the planning process. The 2005 point and area source estimates have been carried forward because actual 2006 emissions data are not yet available.

Table 3 – Winchester Area Emissions Inventories and Trends

Source Category	1999 (Baseline)	2002 (Interim)	2005 (Previous Year)	2006 (Current Year)	2007 (Control Case)
<i>Volatile Organic Compounds (VOCs)</i>					
Point Sources	6.019	5.638	4.070	4.070	6.068
Area Sources	7.806	7.982	7.137	7.137	7.081
Non-road Sources	2.650	2.672	2.270	2.161	2.051
Mobile Sources	8.047	7.164	6.000	5.695	4.934
Totals:	24.522	23.456	19.477	19.063	20.134
<i>Oxides of Nitrogen (NO_x)</i>					
Point Sources	0.745	0.934	0.970	0.970	1.075
Area Sources	2.526	2.603	1.412	1.412	2.612
Non-road Sources	1.910	1.942	1.770	1.709	1.647
Mobile Sources	15.090	14.029	12.950	11.907	9.952
Totals:	19.271	19.508	17.102	15.998	15.186

Figure 4 – Winchester Area Emissions Inventory Trends



The Winchester area is well on its way to achieving the emissions reductions needed to meet the attainment year (2007) goals. Preliminary 2006 emissions levels are below the 2007 VOC emission target by 1.07 tons per day and within 0.81 tons per day of the NO_x target. A final 2006 inventory will be provided in the June 2007 status report.

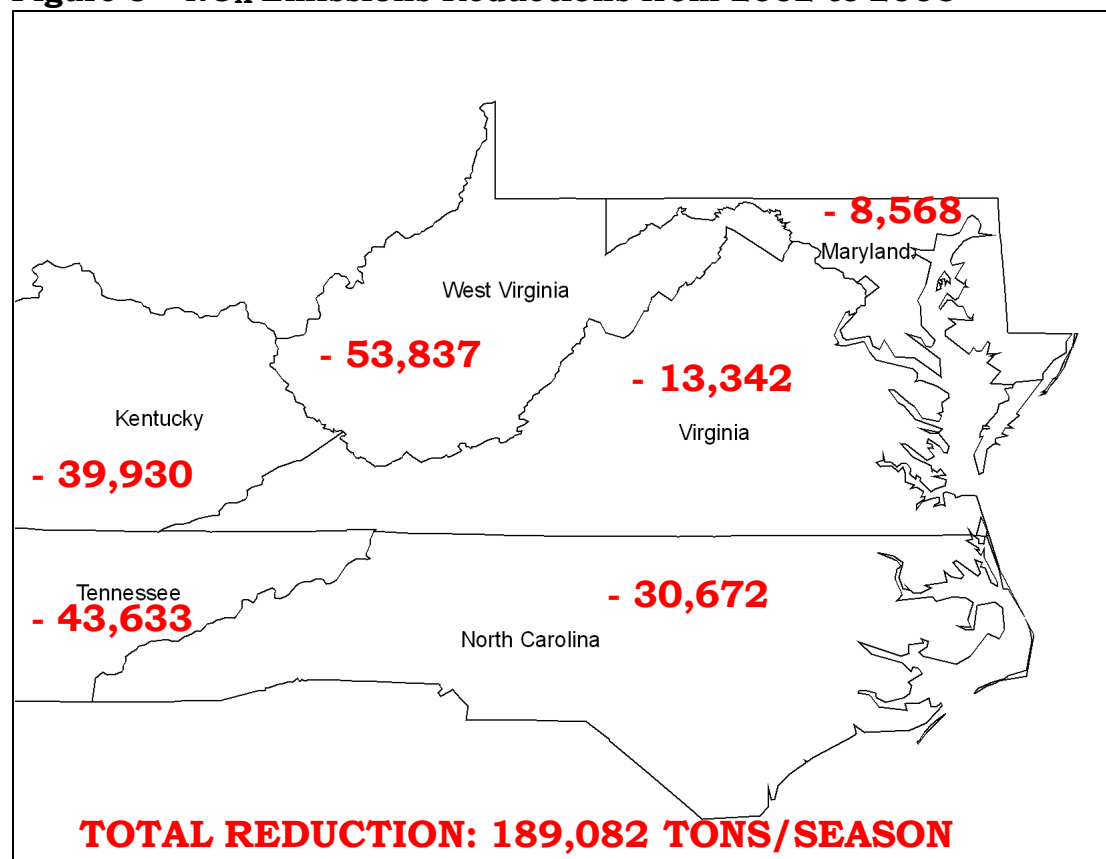
Regional/State Programs Update

The Virginia Department of Environmental Quality (VADEQ) has implemented several control measures to assist the Winchester 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 are being driven by the significant reduction of NO_x emissions in the area. An updated assessment of NO_x emissions reductions has been performed for Virginia and surrounding states using data from the EPA Clean Air Markets Division. The results of this analysis are presented below:

Figure 5 – NO_x Emissions Reductions from 2002 to 2006



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 Winchester 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 existing source and Reasonably Available Control Technology (RACT) regulations to the Winchester 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 existing sources of the Volatile Organic Compound (VOC) have been extended to the Winchester 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
- 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

Once these regulations became effective, the VADEQ regional office identified approximately 46 point sources in the Winchester area that were potentially subject to one or more these regulations (not including repair shops). These sources were subsequently notified of the potential applicability of these regulations by letter dated February 26, 2004.

As a result of this notification process, most of these sources were determined to be exempt from these rules. The remaining sources have been determined to be in compliance or have permits which include VOC control requirements equal to or more stringent than 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 0.8 tons per day of cumulative reductions from these requirements remains valid.

The second part of the control requirements involved case by case RACT determinations for major sources of NO_x. One point source in the Winchester area was identified as being subject to this requirement which resulted in source specific RACT determination and permit that were submitted to the EPA and approved as separate SIP revisions as part of the overall EAP SIP. This RACT determination for the Global Chemstone Company did not require any additional controls and no reductions were included in the EAP.

4. Enhanced Ozone Forecasting tool for the Winchester Area

One of the main components of the local early action program is the establishment of an ozone 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 Winchester area:

- The VADEQ contracted with Sonoma Technologies Inc. to develop an enhanced ozone forecasting tool for various areas in Virginia, including the Winchester area. This work has been completed.
- An additional meteorologist has been hired to support the VADEQ air quality forecast and advisory program.
- A consultation process has been established with other local EAC areas in Maryland and West Virginia to discuss and issue cooperative daily forecasts.
- The Winchester 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

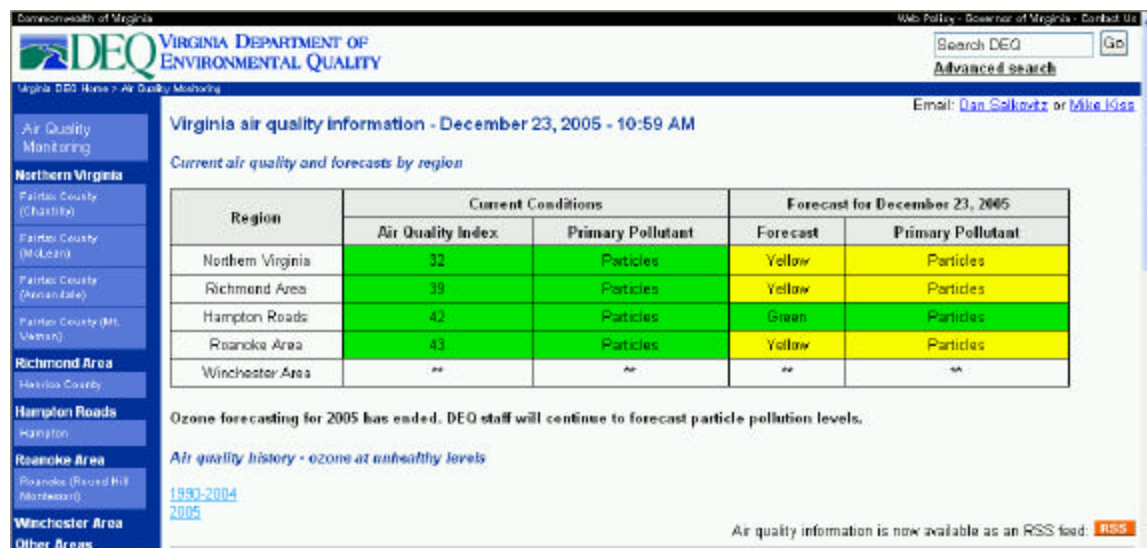
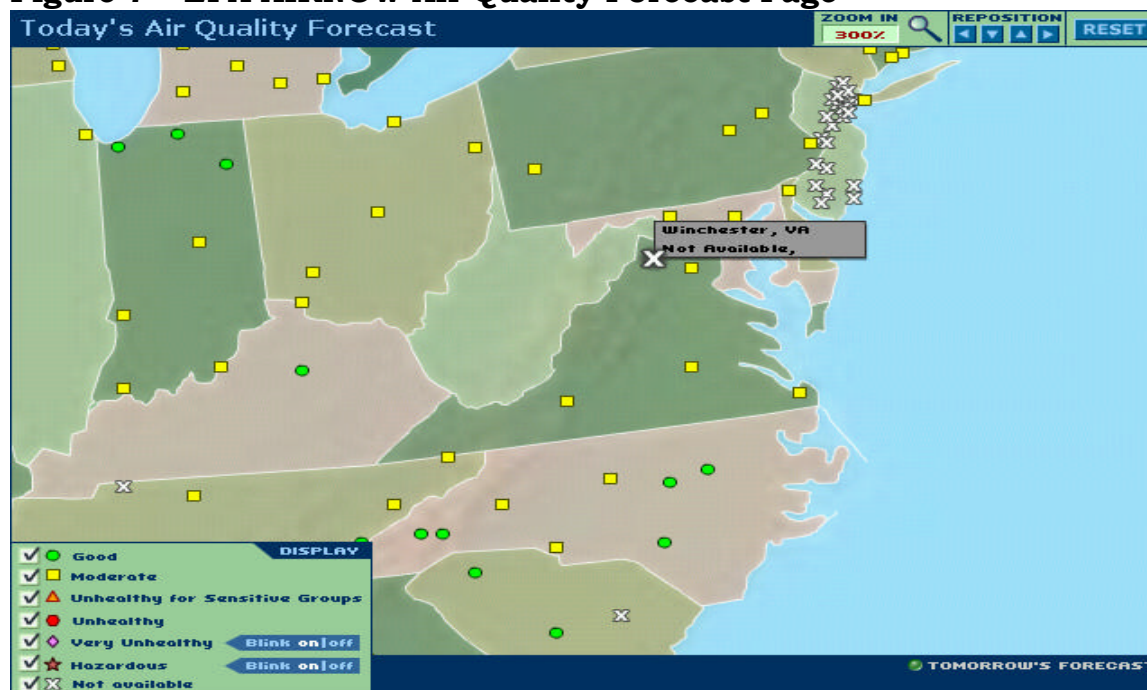


Figure 7 – EPA AIRNOW Air Quality Forecast Page



5. School Bus Emissions Control Retrofit Program

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

Frederick County: 127 school buses retrofitted with diesel oxidation catalysts (DOC) at a total cost of \$163,000.

Winchester City: 8 buses retrofitted with DOC at a total cost of the project was \$8,800.

6. 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 Winchester area. This more restrictive program will replace the local program when it becomes effective in 2007.

Control Program and Measures Summary

In general, the Winchester area and its state and federal partners have been very successful in implementing the commitments contained in the air quality plan. A summary of the control measures and estimated reductions in 2007 is presented below. No changes have occurred in the emission reduction estimates from the 2004 SIP. Appendix B of the 2004 SIP submission provides detailed descriptions of these measures and the methods used to calculate the predicted emission reductions.

Control Measures & Estimated Emissions Reductions (2007)

Emissions Control Measures	VOC (tpd)	NO_x (tpd)	Modeled
<i>State/Federal Area Source Controls</i>			
Architectural & Industrial Paints – Federal Rule (Federally Enforceable)	0.134	0.000	YES
Consumer Products – Federal Rule (Federally Enforceable)	0.056	0.000	YES
Metal Cleaning Solvents – Federal Rule (Federally Enforceable)	0.056	0.000	YES
Motor Vehicle Refinishing – Federal Rule (Federally Enforceable)	0.003	0.000	YES
Cutback Asphalt – State Rule (Federally Enforceable)	0.001	0.000	YES
Subtotals:	0.250	0.000	
<i>Federal Non-Road Source Controls</i>			
Small Gasoline Engine Standards – Federal Rule (Federally Enforceable)	0.812	0.027	YES
Diesel Engine Standards – Federal Rule (Federally Enforceable)	0.047	0.276	YES
Locomotive Engine Standards – Federal Rule (Federally Enforceable)	0.000	0.020	YES
Large Gasoline Engine Standards – Federal Rule (Federally Enforceable)	0.068	0.248	YES
Recreational Engine Standards – Federal Rule (Federally Enforceable)	0.004	0.000	YES
Subtotals:	0.931	0.571	
<i>Federal Mobile Source Controls</i>			

Emissions Control Measures	VOC (tpd)	NO_x (tpd)	Modeled
Previous Motor Vehicle Standards – Federal Rule (Federally Enforceable)	2.675	3.202	YES
Tier 2 Vehicle Standards – Federal Rule (Federally Enforceable)	0.438	1.825	YES
Heavy Duty Diesel Standards – Federal Rule (Federally Enforceable)	0.001	0.111	YES
Subtotals:	3.114	5.138	
<i>State/Local Early Action Plan Controls</i>			
Existing Source RACT Controls – State Rule (Federally Enforceable)	0.792	0.000	YES
Ozone Action Days Program – State/Local (Mandatory/Voluntary)	0.302	0.015	YES
VMT Reduction – Local (Voluntary)	0.148	0.299	NO
Open Burning Restrictions (Mandatory/Voluntary)	0.122	0.280	NO
School Bus Retrofit Program (Mandatory)	0.002	0.001	NO
Engine Idling Restrictions (Mandatory/Voluntary)	0.000	0.102	NO
Subtotals:	1.366	0.697	
TOTALS:	5.661	6.406	

More details on local implementation efforts can be found in this the local status report and the implementation summary page.