

10.0 Attainment Demonstration

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10.5.11 Local Government Voluntary Initiatives

In addition to participating in Clean Air Partners programs (described in the following sections), the local governments and state agencies in the Washington region have taken a coordinated, proactive approach to reducing emissions attributable to their organizations on an episodic basis. These actions reduce VOC and NO_x emissions from a variety of source sectors. Programs include:

- Local jurisdictions have committed to purchasing low-emission vehicles reducing emissions from on-road sources.
- Shutdowns of county waste-to-energy facilities reduce stationary source emissions.
- Reducing emissions from peaking units that generate electricity can reduce NO_x emissions during periods of poor air quality.
- State agencies and county governments ban refueling of non-emergency fleet vehicles and application of traffic paint and pesticides, eliminating area source emissions.
- Many of these organizations also ban operation of lawn and garden equipment to reduce non-road emissions.
- Mobile emissions are reduced through liberal leave policies and support for teleworking on Code Red Days.
- Tree planting programs are being developed by the local jurisdictions in the region as a long term strategy to improve air quality.

Local jurisdictions in the Washington region are making program commitments reflected in the Voluntary Bundle (Chapter 6) or, in the case of low-emission vehicle purchases, are reserving emission reduction credits that the purchases may generate for potential future use in meeting transportation conformity. The City of Alexandria has specifically requested that a variety of programs being implemented by the city, including low-emission vehicle purchases, use of low-VOC paints, Green Building and energy efficiency programs, and episodic programs, be applied in the SIP as weight of evidence.

Though the benefits of episodic programs are not reflected in the region's 2009 controlled inventory, the programs are an important part of the region's attainment strategy and provide additional evidence that the region will attain the ozone standard in 2009.

10.5.11.1.1 Voluntary Action Campaign: Clean Air Partners

Clean Air Partners is a bi-regional public-private partnership in the Baltimore Washington region created to develop and implement voluntary action programs to reduce emissions on the days when ozone levels are expected to be high.

The partnership was created in 1994 by the Metropolitan Washington Air Quality Committee (MWAQC), the Transportation Planning Board of the National Capitol Region (TPB) and the Baltimore Metropolitan Council (BMC). The partnership, originally known as ENDZONE Partners, has conducted an air quality public education campaign in the Washington and Baltimore metropolitan areas since 1995. The purposes of the campaign are to raise public awareness of air quality issues and to promote voluntary actions to improve air quality. The campaign is funded by public funds from Maryland, Virginia, the and District of Columbia, and receives staff support from the state air management agencies. In 1997 the partnership formed a new formal public-private partnership, hired a managing director, and in 1999 changed its name to Clean Air Partners.

The Ozone Action Days employer program was established in 1995 in the Baltimore/Washington region. This program encourages employers and their employees to take voluntary actions to reduce ozone pollution causing emissions. When the Environmental Protection Agency (EPA) designated both Baltimore and Washington, DC metropolitan regions as nonattainment for fine particles, Clean Air Partners' Board of Directors changed the name of the program from Ozone Action Days to Air Quality Action Days (AQAD).

The AQAD program is designed to educate employers and employees to take voluntary actions, specifically on Code Red days. It was argued that voluntary actions taken on the worst days of summer would "shave the peaks," or reduce the high ozone levels on the worst days. Clean Air Partners provides resources and information to a network of AQAD participants. Clean Air Partners assists employers in establishing on-site programs designed to reduce employee travel on bad air days; and encourages voluntary actions by business, industry, government, and individuals to restrict activities that contribute to the formation and risks of bad air. Approximately 600 employers and individuals are registered as AQAD participants and have committed to take voluntary actions to reduce emissions on Code Red days.

Clean Air Partners runs an extensive education campaign throughout the ozone season, May to September, to educate the public about the effects of ground-level ozone and fine particles. The messages tell people what they can do to protect their health and improve air quality. Air quality forecasts are distributed daily by fax and email to the media and Air Quality Action Days participants. The air quality forecast is color-coded for ease of communication, following EPA's regulation for the Air Quality Index (AQI).

During the ozone season, in addition to communicating daily with television and radio meteorologists in the regions, Clean Air Partners places radio and television ads to advise about the health risks and to promote less polluting behaviors on unhealthy air days. The ad messages target individual emission reduction actions for behavior modification and the health effects of poor air quality.

10.5.11.1.2 Evaluation of Voluntary Action Campaign

Despite improvements in the region's air quality, new challenges lie ahead for the AQAD employer program. Prior to 2006, Clean Air Partners asked its participants to take voluntary actions on Code Red days, which was associated with the 1-hour ozone standard. When EPA set

the 8-hour ozone standard to coincide with the Code Orange Air Quality Index it resulted in approximately 20 or more days per year that exceed the standard.

Typically Clean Air Partners conducts surveys to determine the effectiveness and reach of its message. Two types of surveys are conducted, an “end of season” survey and an “episodic survey,” taken on the evening of a forecasted Code Red Day. Surveys have been conducted by the partnership since 1995.

The end-of-season survey, conducted eight times since 1995, is used to estimate the potential for behavior change and to help target the right messages. Episodic surveys began in the summer of 1999. The objective of the episodic survey is to determine if the Clean Air Partners’ message is being heard and if the potential for behavior change is being realized. A study looking at trends in results of surveys taken over eight years indicates that the episodic survey, conducted on the evening of a forecasted Code Red Day, provides the most reliable measure of behavior in response to the campaign. Survey results show a steady increase in the public’s “willingness to act,” with 76 percent of the respondents indicating a belief that the individual can make a difference.

10.5.11.1.3 Trends in Survey Results

Data from the two types of surveys indicate that general knowledge levels about air quality and its measurement systems increased substantially in both metropolitan areas during the five years studied, 1996-2001. Knowledge that Code Red indicates unhealthy air when activity should be limited increased significantly during the period. A 2002 survey showed over 90 percent surveyed knew that today was a “Code Red/Bad Air Day,” and 67 percent said the phrase Code Red means “air is unhealthy.”

The end-of-season survey results for the Washington metropolitan region show the percentage of residents willing to act grew from 35 percent to 44 percent over a six-year period. The percentage of people reporting changing their behavior in response to the Code Red message grew to 66 percent, an increase of 23 percent from 1996. The findings from the surveys show:

- Increase in knowledge about ground-level ozone and color-code rating system
- Steady increase in “willingness to act” from 35 percent in 1996 to 44 percent in 2001.
- Behavior change in response to bad air days is common

Avoidance of health risk is most common reason for behavior change (66%); second reason is to reduce emissions (17 percent).¹

¹ “An Analysis of Air Pollution-Related Knowledge, Attitudes, and Behaviors Across Time: The End of Season and Episodic Surveys,” Fox, J. Clifford and Mousumi Sarkar, Virginia Commonwealth University, December 2002, prepared for Clean Air Partners.

10.5.11.2 Code Red/Code Orange Telework Program

Clean Air Partners is adopting a new program to increase teleworking as an episodic strategy. Beginning in the summer of 2007, Clean Air Partners will promote teleworking throughout government and businesses when air quality is forecasted to be in the unhealthy for sensitive groups range, Code Orange or above. The decision to initiate Clean Air telework days will be guided by forecasts issued using the Air Quality Index (AQI). Three-day forecasts are issued by the Maryland Department of the Environment and the Metropolitan Council of Governments for the Washington region.

Clean Air Partners will develop a toolkit that will assist organizations in promoting, establishing and tracking a telework program and provide resources for keeping abreast of forecasted and current air quality levels in the region. Participants will be asked to track their participation using a web-based system that tracks auto emission reductions resulting from teleworking (NO_x, VOC, CO, and CO₂).

The University of Maryland (UM) will evaluate the telework program through photochemical modeling by using different assumptions regarding the programs effectiveness at reducing Vehicle Miles Traveled (VMT). Preliminary UM modeling indicates that a strengthened telework program has the potential to reduce VMT and thereby leads to a measurable ozone reduction on the worst days of summer (see Appendix G Attachment 14)

10.5.11.3 High Electrical Demand Day Emission Reduction Strategies

Emissions from Electric Generating Units (EGUs) are higher on high electric demand days, resulting in poorer air quality. High electrical demand day (HEDD) operation of EGUs generally have not been addressed under existing air quality control requirements, and these units are called into service on the very hot days of summer and on very cold days of winter when air pollution levels typically reach their peaks.

The Ozone Transport Commission (OTC) has been meeting with state environmental and utility regulators, EPA staff, EGI owners and operators and the independent regional systems operators to assess emissions associated with HEDD during the ozone season and to address excess NO_x emissions on HEDDs. The OTC has found that NO_x emissions are much higher on a high electrical demand day than on a typical summer day and there is the potential to reduce HEDD emissions by approximately 25 percent in the short term through the application of known control technologies. HEDD units consists of gasoline and diesel combustion turbines, coal and residual oil burning units. A group of six OTC states has agreed to pursue non-regulatory strategies with the EGUs to achieve reductions in NO_x emissions associated with HEDD units on high electrical demand days during the ozone season. The six states agreed to achieve these additional reductions beginning with the 2009 ozone season or as soon as feasible thereafter, but no later than 2012.

On March 2, 2007, the OTC states and the District of Columbia agreed to a Memorandum of Understanding (MOU) committing to reductions from the HEDD source sector. The MOU includes specific targets for a group of six states to achieve reductions in NO_x emissions

associated with HEDD units on high electrical demand days during the ozone season. These states agreed to achieve these reductions beginning with the 2009 ozone season or as soon as feasible thereafter, but no later than 2012. The remaining OTC states including Virginia and the District of Columbia agreed to continue to review the HEDD program and seek reductions where possible but they do not have a formal emissions reduction target in the MOU.

Through the HEDD MOU commitments, significant NO_x reductions are anticipated in the Washington DC-MD-VA ozone nonattainment area from the program Maryland expects to develop with EGUs. Maryland has agreed to a specific NO_x emission reduction target in the MOU of a state-wide reduction of NO_x emissions from HEDD units by 32 percent, or an estimated 23.5 tons per day. The OTC MOU is included in Appendix G.

10.5.11.4 Tree Canopy Programs

Large-scale tree-planting programs offer a method to improve air quality across the Washington, DC-MD-VA ozone non-attainment area. Tree cover in urban areas plays an important role in the complex system of ground level ozone production. Results from analysis conducted by the University of Maryland suggest that decreases in ground level ozone concentrations on the order of 1-3 ppbv could be realized with an increase in urban tree cover ranging from 20-40 percent. Corresponding changes in wind speed will occur in modified areas as well. These changes are the result of the lessening of the urban “heat island” effect. Heat islands form as cities replace natural land cover with pavement, buildings, and other infrastructure. The heat in a heat island is the result of the different radiative properties (i.e. the ability of objects to absorb and/or reflect the sun’s energy) between urban and rural areas. Urban areas are more efficient at absorbing sunlight than rural areas. The excess energy absorbed by urban areas is eventually reradiated back to the atmosphere in the form of heat (aka infrared radiation). Weakening of the heat island effect results in a transfer of energy from the urban areas to downwind areas which causes some locations to observe a slight increase in surface temperatures (1-2 °C) and in wind speeds (1-2 ms⁻¹).

The general consensus from the studies mentioned above suggests that increased tree cover has a beneficial effect on local air quality by reducing ozone in and around urban areas. As discussed in Appendix G, the modeled temperature changes are accompanied by changes in ground level ozone concentrations. Owing to the complexity of the system, changes in ozone, like temperature, are not confined to locations where trees are planted. Different locations downwind of modified areas observed either increased or decreased ozone levels depending on a variety of factors. The reduction of surface temperature (specifically, cooling in urban areas) obtained from the numerical modeling studies was used as the basis for predicting changes in daily mean peak 8-hour ozone levels derived from a multiple linear regression model for the Baltimore Non-Attainment Area.

A large-scale tree-planting program may lead to improved air quality. Given the slow growth rate of trees, large scale tree planting is a long term solution. It is believed that the genera of trees used to reforest is important, but what species of tree offers the most benefit is not clear and may differ from locale to locale. Other significant, logistical questions also need to be considered when planning a large-scale tree planting program. In the near term, this analysis

points to the importance of programs to maintain tree cover and prevent increases in ozone due to loss of tree cover.

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