

Reasonably Available Control Measure (RACM) Analysis for Cecil County, Maryland

SIP Revision 01-09
(Proposed)

July 18, 2001

Prepared for:

U.S. Environmental Protection Agency

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Executive Summary

The purpose of this document is to compare available control measures to adopted control measures to determine whether the Cecil County nonattainment area will comply with the federal ozone standard as quickly as possible. Section 172(c)(1) of the Clean Air Act requires State Implementation Plans (SIPs) to contain reasonably available control measures (RACM) as necessary to provide for attainment as expeditiously as possible. In order for a state's attainment demonstration to be approved by the EPA, the State must address whether additional control measures exist that are reasonably available and that may advance the attainment date. The Maryland Department of the Environment (MDE), as the lead air quality agency for the State of Maryland, conducted this RACM analysis in an effort to show the progress Cecil County has made under the Clean Air Act and to describe the RACM applicable to the area.

In December 1999, the U.S. Environmental Protection Agency (EPA) proposed approval of the *Phase II Attainment Plan for the Baltimore Region and Cecil County (MD SIP 98-12)*, conditioned on several actions by the State. Under the terms of a recent consent decree, EPA must propose final approval of the Baltimore Region and Cecil County attainment demonstration SIP by October 15, 2001. If EPA has not fully approved the attainment demonstration SIP, EPA is obligated to promulgate an attainment demonstration Federal Implementation Plan (FIP) by June 14, 2002. Failure to address the RACM requirement of the CAA could result in disapproval of the attainment demonstration SIP. A copy of the EPA Policy Memo, dated November 30, 1999, is included as appendix A.

Strategies for reducing precursors of ozone emissions are not all contained in the SIP. Many formal plans also provide opportunities to include control measures that reduce pollution. Certain measures may be funded in the short-term under the Transportation Improvement Program, or be committed to in the long-range transportation plan. Control measures may be implemented either at the local level, or implemented as a trial or research project to determine their effectiveness in producing additional emission reductions.

Since there are a number of opportunities to reduce the precursors of ozone emissions, this document presents a summary of the analyses conducted to determine whether the Cecil County SIP includes all reasonably available control measures. The control measures were evaluated using the following criteria provided in the November 30, 1999 EPA guidance to determine whether the measures were RACM and should be included in the SIP: cost effectiveness, feasibility of implementation, and sufficient benefits to accelerate attainment. EPA guidance provides a narrow definition of RACM. The guidance states that measures which can be implemented and produce sufficient benefits to advance the attainment date are RACM. The guidance states that cost can be a factor in determining whether a measure is reasonable. The guidance states that control measures that are not enforceable are not RACM.

The MDE reviewed two lists of transportation control measures (section 108 measures): 1) the list reviewed by New Castle County for conformity purposes, and 2) the list reviewed in association with the RACM analysis for the Baltimore Region. In addition, the MDE reviewed certain demographic and factual information to assess the applicability of the following strategies to Cecil County: Vehicle Distribution, Traffic Flow Information, Expected Growth in VMT, Transit Opportunities in the County, and Population and Emission Growth Potential in the County. Based on guidance from the EPA, the MDE considered the feasibility of implementation of the control measure and cost effectiveness of each measure and whether implementation of the measure alone or in combination with other measures would allow Cecil County to attain the federal ozone standard in advance of the mandated 2005 timeframe.

This document does not present a complete cost/ benefit analysis of the total benefits of various measures (i.e., quality of life, utility, etc.). Feasibility considerations included a review of both the planning process and implementation process to evaluate whether additional legislation, regulation, ordinances or contractual modifications were needed and could be instituted in a timeframe that allowed effective implementation of the measure prior to the attainment date. Feasibility also considers whether a measure can be adequately enforced.

Cost effectiveness considerations compared the cost of potential measures against the cost of measures in the SIP on a cost per ton basis. Cost was also evaluated as to whether it was affordable for the region and whether the cost adversely affects a particular social group. The ability of a measure to advance the attainment date was evaluated based on the significance of the reduction compared to the total reductions needed for attainment, on the remaining emissions, and on whether the measures can be implemented and produce reductions by the 2005 ozone season.

Cecil County has low population density and low growth in Vehicle Miles Traveled (VMT). Most of the control measures considered for this analysis originated from an analysis completed in the neighboring area of New Castle County, Delaware, and the measures reviewed in the RACM analysis for the Baltimore Region. These control measures, if implemented in Cecil County, would produce extremely small reduction benefits, many at the one ten thousandths of a ton or less level. As part of the Philadelphia Nonattainment Area, Cecil County contributes less than 1% of the precursors to ozone emissions in the total emissions inventory.

The RACM analysis also considers that there is a significant amount of ozone transportation into Cecil County from both the Baltimore Region and the Philadelphia Region. Therefore, the amount of emissions reductions needed to advance attainment is higher than for most surrounding areas. Even a significant reduction is unlikely to accelerate attainment.

One additional source of emission reductions which is significant in comparison to other reductions in Cecil County will occur prior to 2004. This measure is an addition to the measures contained in the attainment plan and the measures Maryland will adopt in

response to the attainment plan “shortfall” identified by the EPA. A new source requiring NOx offsets, the Old Dominion Power Plant, will be built in Cecil County. This source will emit 505 tons of NOx per year or about 1.38 tons per day of NOx. As Cecil County is in a severe ozone nonattainment area, the new source will need to secure NOx emissions offsets at a 1.3 to 1 ratio resulting in an additional 0.32 tons per day of NOx emission reduction for Cecil County. Although the offset produces emissions reductions the same as a RACM measure, its special circumstances prevent it being considered RACM.

The purpose of the SIP revision is to satisfy the requirement of the CAA Section 172 (c)(1). The MDE realizes the long-term value of many of the strategies examined in this document to provide air and water quality benefits, congestion management benefits and livable community benefits. The determination that a control measure is not RACM or does not apply to the area, does not imply that innovative measures are not under development in Cecil County and may be included in the SIP at a later date. The potential emissions reductions benefits resulting from both the Smart Growth legislative package and the Commute Smart legislative package have proven to be effective in Cecil County and are supported by State agencies. These programs, will be re-evaluated at a later date for inclusion in the SIP.

Based on the types of measures reviewed and the costs of these programs in association with the potential emissions benefits for Cecil County, the MDE determined that there are no reasonably available control measures for Cecil County that would advance attainment of the ozone standard prior to 2005.

1.0 Introduction and Conclusions

A. Introduction:

The purpose of this document is to compare available control measures to adopted control measures to determine whether the Cecil County nonattainment area will comply with the federal ozone standard as quickly as possible. Section 172(c)(1) of the Clean Air Act requires State Implementation Plans (SIPs) to contain reasonably available control measures (RACM) as necessary to provide for attainment as expeditiously as possible. In order for a state's attainment demonstration to be approved by the EPA, the State must address whether additional control measures exist that are reasonably available and that may advance the attainment date. The Maryland Department of the Environment (MDE), as the lead air quality agency for the State of Maryland, conducted this RACM analysis in an effort to show the progress Cecil County has made under the Clean Air Act and to describe the RACM applicable to the area.

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measures contained in the attainment plan and the measures Maryland will adopt in response to the attainment plan “shortfall” identified by the EPA. A new source requiring NOx offsets, the Old Dominion Power Plant, will be built in Cecil County. This source will emit 505 tons of NOx per year or about 1.38 tons per day of NOx. As Cecil County is in a severe ozone nonattainment area, the new source will need to secure NOx emissions offsets at a 1.3 to 1 ratio resulting in an additional 0.32 tons per day of NOx emission reduction for Cecil County. Although the offset produces emissions reductions the same as a RACM measure, its special circumstances prevent it being considered RACM.

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B. Methodology:

During the last decade, the MDE has compiled exhaustive lists of potential control measures with the assistance of local metropolitan planning organizations (MPO’s) such as the Baltimore Regional Transportation Board (BRTB), Metropolitan Washington Air Quality Committee (MWAQC), and the Wilmington Area Planning Council (WILMAPCO). The MDE has also conducted extensive research into measures used in other states as air quality control strategies. Time and resources limit the selection of strategies for analysis.

The MDE conducted the RACM analysis for Cecil County with more limited resources than were available in the Baltimore Region. The MPO for Cecil County is WILMAPCO. WILMAPCO is structured differently than the MPO for the Baltimore Region. Both Maryland and Delaware operate independently as sub-regions within the area when analyzing transportation emissions. The WILMAPCO staff is considerably smaller than the staff for the Baltimore region and emissions modeling is done by the States separately. These organizational differences limited the amount of original analysis performed for Cecil County without expensive contractual assistance.

For many analyses in this document, emission reduction estimates were calculated by developing a ratio of VMT or population for Cecil County to VMT or population in the Baltimore or Wilmington area. The MDE deemed this method satisfactory, since for most measures the magnitude of the emissions reduced was not the sole factor for rejecting the measure as RACM.

C. Cost Comparisons

When making decisions on the selection of any emission control measure, cost is a consideration. The cost of a new measure may be borne by the regulated industry being effected, or the cost may be placed on the implementing agency tasked with ensuring proper and timely implementation. When reviewing the cost of an emission control measure, the most common analysis uses the cost per ton of a measure. Typically, control measures based on technological innovations have lower costs than measures that require behavioral changes. Behavioral changes have relatively low emission benefits compared with their implementation costs. For the purposes of this analysis for RACM, a program is considered to have a high cost if the cost of the measure exceeds \$10,000 per ton.

D. Conclusion

Based on the types of measures reviewed and the costs of these programs in association with the potential emissions benefits for Cecil County, the MDE determined that there are no reasonably available control measures for Cecil County that would advance attainment of the ozone standard prior to 2005.

2.0 Background

A. Overview

Cecil County is the only County in Maryland contained in the Philadelphia Nonattainment Area. Cecil County became a nonattainment area in 1992. During the last decade, many former control policies have been reexamined and research into the ozone problem has redirected and refined many control programs. Three long term control plans, one of which was the attainment plan, and numerous individual control SIPs were filed. A brief history of these major plans follows in section B.

Under this RACM process, all of the SIPs were reexamined to inventory the control programs in place and were reviewed against current emission inventories to look for additional categories that might provide significant reductions.

B. History of Cecil County under the Clean Air Act

Under the 1990 Clean Air Act Amendments, the Baltimore region and Cecil County were classified as a severe nonattainment area with respect to the National Ambient Air Quality Standard for ozone. By November 1994, the Clean Air Act required that severe ozone nonattainment areas submit an attainment plan that included a photochemical modeling demonstration that the area would comply with the federal ozone standard by 2005. In a memorandum dated March 2, 1995, Mary Nichols, Assistant Administrator of the U. S. Environmental Protection Agency (EPA), provided an extended schedule for submitting attainment demonstrations in two phases for serious and severe ozone nonattainment areas. The extended schedule was contingent upon participation in the Ozone Transport Assessment Group and adoption of regional control measures such as the National Low Emission Vehicle (NLEV) Program and regional nitrogen oxides (NO_x) reductions from utilities and other large NO_x sources.

On April 28, 1998 Maryland submitted an attainment plan for the Baltimore Nonattainment Area and Cecil County entitled *Phase II Attainment Plan for the Baltimore Region and Cecil County*. This plan included local and regional modeling and weight of evidence demonstrations that these areas would be likely to achieve compliance with the federal ozone standard if pollution transported from areas outside these nonattainment areas was reduced. Maryland participated in the Ozone Transport Assessment Group (OTAG) process to identify a suite of regional strategies that would reduce transport across the eastern half of the United States. These regional measures, when combined with federal, state and local measures already included in the Phase II Attainment Plan were likely to result in achieving compliance with the ozone standard in 2005.

On November 7, 1997, EPA proposed federal regulations called *Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone* (NO_x SIP Call). The proposed regulations were based on the OTAG recommendations, which required 22

states to cut emissions to reduce transport. On August 17, 1998, Maryland submitted a supplement to the Phase II Attainment Plan which included additional modeling of these regional strategies performed by EPA as part of the NO_x SIP Call.

Recently, Maryland has made several changes to the mobile budget portion of the Phase II SIP in response to the introduction of new mobile source control measures (Tier II, NLEV). In addition, Maryland has continued to provide innovative ideas for potential inclusion in the SIP to both the EPA and local stakeholders. In response to commitments made by Maryland to the EPA pertaining to the conditional approval of the Phase II SIP, Maryland intends to complete a mid-course review, analysis, submit measures to make up an emission reduction shortfall that EPA identified, and develop new motor vehicle emission budgets using the new mobile model, MOBILE6. Based on these commitments, Maryland expects full approval of the Phase II SIP in October of 2001.

C. Ozone Attainment Progress

The following is a chart that summarizes the control measures in the Attainment Plan for Cecil County that provide air quality benefits, and the expected emission benefits for the attainment year of 2005:

Control Measure	2005	
	VOC	NOx
Enhanced I/M		
Tier I		
Reform Gas		
Stage II/Refuel		
FMVCP/RVP		
Total Mobile	9.5	7.4
Open Burning	3.5	0.7
Surface Cleaning/ Degreasing	0.2	0.0
Architectural Coatings	0.2	0.0
Consumer Products	0.1	0.0
Auto Refinishing	0.2	0.0
Stage I Vapor Recovery	0.8	0.0
Nonroad Small Engines	0.8	0.0
Nonroad Diesel Engines	0.0	0.5
Railroads	0.0	0.2
Screen Printing	0.0	0.0
Graphic Arts - Lithography	0.1	0.0
Graphic Arts – Rotogravure & Flexographic	0.0	0.0
Total	15.4	8.8
Projected Uncontrolled Emissions	24.5	18.6
Emission Level Obtained	9.1	9.8
Emission Level Required	9.4	11.7
Surplus	0.3	1.9

As identified in the above table, more reductions than were needed to meet Rate of Progress requirements were identified in the attainment plan. The 1998 attainment plan included all the measures in the above table, as well as reductions from Tier 2 vehicle standards. The attainment plan documented that sufficient VOC reductions would be in place by 2005 to meet the Rate-of -Progress (ROP) requirements, and cover the contingency measures requirement without the use of available NOx reductions. NOx reductions are needed as part of the attainment plan as shown by photochemical modeling. The EPA concluded that the attainment target described in the attainment plan was sufficient for Cecil County, except for a small VOC and NOx shortfall. The MDE will address the shortfalls through the adoption of measures identified in the Ozone Transport Commission regional process.

3.0 RACM Measure Analysis

A. Phase II State Implementation Plan Review

In the 1998 attainment plan, the MDE listed potential measures that might be considered for emission credits (as found in Chapter 3 of the plan). These measures were analyzed for their emission reduction potential for the Baltimore and Cecil County Regions (combined) in that SIP. This analysis evaluated the potential of these measures as RACM in Cecil County.

<i>Control Measure</i>	<i>Cost Effectiveness</i>	<i>Who is affected?</i>	<i>Other information</i>	<i>Status</i>
California Reformulated Gasoline	\$5,000/ ton of VOC	Petroleum industry and general public	Increase in price of gallon of gas by 16 cents	Needs legislation; supply difficult, political opposition
Statewide Reformulated Gasoline	\$500 / ton of VOC reduced	Petroleum industry and general public	Increase in price of gallon of gas by 3 to 5 cents	Phase II RFG in place in 2000.
Use of Shutdown Credits	\$1,000 - \$3,000/ ton of VOC reduced	Sources seeking to bank credits for trading and new businesses seeking to buy offsets	Offset credit unavailable	Banking and trading rule is under development; informal trading under EPA supervision
Super RACT Controls on Stationary Sources	> \$5,000/ ton VOC. Plus charges on company	Major VOC sources	Cecil County has very few major stationary sources	Not applicable
California Standards for Paint	> \$8,000/ ton of VOC	Paint manufacturers and consumers	Increased price in gallon of paint by > 10%	Potential shortfall measure

<i>Control Measure</i>	<i>Cost Effectiveness</i>	<i>Who is affected?</i>	<i>Other information</i>	<i>Status</i>
California Standards for Consumer Products	Large range due to wide variety of products	Manufacturers and consumers	Increase in the price of consumer products by 10-15%	Potential shortfall measure
Heavy Duty Diesel Inspection Program	\$3,000 to \$28,000/ ton of VOC	Diesel vehicles operators and implementing agencies	Many diesel vehicles not registered in Maryland	Implemented by Maryland but emission benefits unknown at this time
Cash for Clunkers Program	\$2,500/ ton of VOC.	Group or agency providing funding	New fleet mix shows decrease in pre-1980 cars	Need funding source for rebates
Maximum Available Control Measures	NA	Major Stationary Sources	Cecil County has very few major sources	NA

B. Analysis of Transportation-related Control Measures

1. New Castle TCM Review:

According to EPA guidance, the Transportation Control Measure (TCM) List (16 total) identified in section 108 of the CAA should be reviewed for RACM. Such an analysis was recently completed for the Wilmington portion of the WILMAPCO region by the Delaware Department of Transportation. This analysis was applied to Cecil County with ratio techniques. Appendix B contains a summary of the emission reductions calculated for each individual measure if implemented in New Castle County.

The New Castle County TCM analysis (a matrix of 16 total TCM's from CAA Section 108) showed that in the year 2005 (the attainment year), the suite of TCMs would produce an emissions reduction of 0.35 tons per day of NO_x and 0.72 tons per day of VOC. Based on data from the 2025 WILMAPCO transportation plan, the expected VMT for New Castle County was around 15 million miles per day. In comparison, Cecil County showed an expected VMT of around 3 million miles per day. Using a simple ratio calculation, the potential expected reductions for Cecil County based on the New Castle County calculations would be 0.15 tons per day of VOC and 0.08 tons per day of NO_x.

#	<i>TCM</i>	<i>Analysis</i>
1	Programs for improved public transit	Part of TCM package reviewed by New Castle County. Reduction for individual measure very low. Cost effectiveness analysis shows measure very costly. Measure not likely to advance attainment. Measure too costly. Not RACM.
2	Restriction of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high occupancy vehicles	Part of TCM package reviewed by New Castle County. HOV lanes under study for I-95 corridor. Implementation not expected in time to advance the attainment date.
3	Employer-based transportation management plans, including incentives	New legislation in Maryland. Implementation not expected in time to advance attainment. Not RACM.
4	Trip-reduction ordinances	Part of TCM package reviewed by New Castle County. Reduction for individual measure very low. Cost effectiveness analysis shows measure very costly. Measure not likely to advance attainment. Measure too costly. Not RACM.

5	Traffic flow improvement programs that achieve emission reductions	WILMAPCO is analyzing congestion management practices for both Cecil and New Castle Counties. Reduction for individual measure very low. Cost effectiveness analysis shows measure very costly. Measure not likely to advance attainment. Measure too costly. Not RACM.
6	Fringe and transportation corridor parking facilities serving multiple occupancy vehicle programs or transit service	Part of TCM package reviewed by New Castle County. Reduction for individual measure very low. Cost effectiveness analysis shows measure very costly. Measure not likely to advance attainment. Measure too costly. Not RACM. Political feasibility limited.
7	Programs to limit or restrict vehicle use in downtown areas or other areas of emission concentration particularly during periods of peak use	Part of TCM package reviewed by New Castle County. Reduction for individual measure very low. Cost effectiveness analysis shows measure very costly. Measure not likely to advance attainment. Measure too costly. Not RACM. Political feasibility limited.
8	Programs for the provision of all forms of high occupancy, shared-ride services	Part of TCM package reviewed by New Castle County. Reduction for individual measure very low. Cost effectiveness analysis shows measure very costly. Measure not likely to advance attainment. Measure too costly. Not RACM. Political feasibility limited.
9	Programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of non-motorized vehicles or pedestrian use, both as to time and place	Part of TCM package being reviewed by New Castle County. Emission reduction potential too small. Will not advance attainment. Not RACM.
10	Programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas	Part of TCM package being reviewed by New Castle County. Emission reduction potential too small. Will not advance attainment. Not RACM.

11	Programs to control extended idling of vehicles	Part of TCM package being reviewed by New Castle County. Emission reduction potential too small. Will not advance attainment. Not RACM.
12	Programs to reduce motor vehicle emissions, consistent with title II, which are caused by extreme cold start conditions	Part of TCM package being reviewed by New Castle County. Limited resources for enforcement. Not RACM.
13	Employer-sponsored programs to permit flexible work schedules	Part of TCM package being reviewed by New Castle County. Emission reduction potential too small. Will not advance attainment. Not RACM.
14	Programs and ordinances to facilitate non-automobile travel, provision and utilization of mass transit, and to generally reduce the need for single-occupant vehicle travel, as part of transportation planning and development efforts of a locality, including programs and ordinances applicable to new shopping centers, special events, and other centers of vehicle activity	Part of TCM package being reviewed by New Castle County. Emission reduction potential too small. Will not advance attainment. Not RACM.
15	Programs for new construction and major reconstructions of paths, tracks or areas solely for the use by pedestrian or other non-motorized means of transportation when economically feasible and in the public interest. For purposes of this clause, the Administrator shall also consult with the Secretary of the Interior; and	Part of TCM package being reviewed by New Castle County. Emission reduction potential too small. Will not advance attainment. Not RACM.
16	Program to encourage the voluntary removal from use and the marketplace of pre-1980 model year light duty vehicles and pre-1980 model light duty trucks.	Part of TCM package being reviewed by New Castle County. Emission benefits not permanent. No funding source. Not RACM.

2. Baltimore TCM Review:

In addition to this analysis for Cecil County, the MDE has been involved in preparing a RACM analysis document for the Baltimore Region (with the assistance of the Baltimore Regional Transportation Board and MDOT). For the Baltimore Region, a total of 104 potential measure (mostly mobile source) were reviewed to determine if they fit the strict EPA interpretation of RACM.

The MDE reviewed the measures considered for the Baltimore document and evaluated whether the measures could be applied in Cecil County. The MDE, due to limited resources, then applied the ratio method to estimate the potential total emission benefits from all measures that were applicable to Cecil County. Appendix C of this report contains a summary chart of measures considered applicable to Cecil County. The table below shows the total estimated VOC and NO_x benefits from applicable programs for the Baltimore region and the potential Cecil County benefits calculated by the process described below.

Strategy #	Baltimore	Baltimore	Cecil	Cecil
	VOC	NOx	VOC	NOx
5	1.185	0.705	0.0609	0.0362
8	0	0	0.0000	0.0000
12	0.263	0.406	0.0135	0.0209
13	0.071	0.109	0.0036	0.0056
15	0.49	1.27	0.0252	0.0653
17	0.023	0.06	0.0012	0.0031
18	0.188	0.5	0.0097	0.0257
19	0.259	0.398	0.0133	0.0204
20	0.061	0.103	0.0031	0.0053
22	0.031	0.09	0.0016	0.0046
23	0.082	0.16	0.0042	0.0082
26	0.001	0.009	0.0001	0.0005
27	0.336	0.473	0.0173	0.0243
30	0.00048	0.001	0.0000	0.0001
31	0.3	0.9	0.0154	0.0462
42	0.129	0.168	0.0066	0.0086
51	0.06	0.135	0.0031	0.0069
61	0.2	0.53	0.0103	0.0272
65	0.015	0.046	0.0008	0.0024
66	0.007	0.018	0.0004	0.0009
67	0.025	0.085	0.0013	0.0044
73	0.3	0.96	0.0154	0.0493
74	0.05	0.005	0.0026	0.0003
78	0.1	0.49	0.0051	0.0252
102	0.009	0.328	0.0005	0.0169
TOTALS	4.19	7.95	0.22	0.41

Strategy numbers are retained from the Baltimore region RACM document.

Using the ratio method, the potential emissions benefits for Cecil County, based on the assumptions identified above would be 0.22 tpd of VOC and 0.41 tpd of NOx. These emissions benefits are based on the following assumptions:

The Baltimore Region recently updated their mobile budget in an effort to apply federal Tier 2 standards. The VMT used in the modeling of this budget for the attainment year (2005) was 71.04 million miles per day. The recently approved Cecil County budget used a 2005 VMT of 3.65 million miles per day. A simple proportion was used to compare the potential benefits from the Baltimore RACM document to Cecil County

$$3,650,000 / 71,040,000 = X / 4.19 \text{ tpd} \quad (\text{for VOC benefits})$$

and

$$3,650,000 / 71,040,000 = X / 7.95 \text{ tpd} \quad (\text{for NOx benefits})$$

The total benefits of 0.22 tpd of VOC and 0.41 tpd of NOx is not insignificant. However, the reduction is the sum of implementing all measures in the table. The expense of implementing all the measures is beyond the means of the State and the County. The “most” significant measures, are strategies 5 and 15, Cash for Clunkers and Telecommuting. The benefits from Cash for Clunkers is transient and currently no funds are available to implement the program. Telecommuting in Cecil County has not reached peak potential due to a lack of suitable job types and relatively light congestion. For these reasons and the reasons cited in the Table in Appendix C, none of these measures is considered RACM.

As part of determining whether measures in Appendix C would be RACM for Cecil County, several other applicable elements were considered.

a. Ratio of Local to Through Traffic: In considering the effectiveness of implementing TCMs in Cecil County, the MDE considered the ratio of local to through traffic in Cecil County. The majority of the VMT in the County occurs on I-95. The majority of the traffic on I-95 in Cecil County is through traffic. These vehicles would not be affected by a county-based TCM or reduction measure. This analysis is supported by the fact that I-95 in Cecil County has the highest percentage of heavy duty truck usage in MD at 16%.

b. Commuter Origin/ Destination Data : According to a 1993 Maryland Report on Traffic Flow (the most recent report available pending 2000 Census information), Cecil County has a total net commuter outflow of over 12,000 people. This is the highest outflow percentage in the region. Over 17,000 workers travel out of the county for work with only 48% of the Cecil County residents working within the jurisdiction. Of the 17,000 workers travelling out of the county, 24% go to the Baltimore Region (mostly

Harford County) and 61% travel to Delaware. Employment statistics show that the housing to jobs ratio is not balanced and new employment opportunities are growing slower than population. This imbalance reduces the effectiveness of many TCMs.

c. Expected Cecil County Growth in VMT: VMT growth calculations are based on travel demand predicted by models. The accuracy of these predictions is checked by Highway performance Monitoring System data.

The WILMAPCO 2025 Long Range Plan predicted an increase of VMT between 2005 and 2025 of 27.68% with a high of 4.84 million miles of VMT per day in 2025. The latest highway usage data forecasts show a 24.67% increase from 2005 to 2025 with a high of 4.82 million miles in 2025. These above data shows that VMT in Cecil County is not actually growing as fast as predicted and less emissions will be generated. It also suggests that TCM benefits may not be as high as predicted.

d. Transit Opportunities in Cecil County: Due to the rural nature of the county, transit opportunities are not as feasible as other regions in Maryland. A bus system has been established that is used in large towns such as Elkton. These buses connect to the Delaware DART system for a transit connection to Newark. From Newark, DE, the DART lines connect to SEPTA which is a rail transit system that travels to Wilmington and Philadelphia.

In addition, in southern Cecil County, there is a MARC station in Perryville which connects Cecil County to Baltimore and Washington. Ridership at the Perryville station has shown an increase according to the MTA, over the past several years. The MARC station currently has 76 free parking spots. The current transit ridership numbers do not warrant significant additional transit investment.

C. RACM for Stationary Sources

1. Offsets in Cecil County

One additional reduction, significant in comparison to other reductions in Cecil County, will occur prior to 2004. This measure is above and beyond the measures contained in the attainment plan and the measures Maryland will adopt in response to the attainment plan “shortfall” identified by the EPA. A new source requiring NO_x offsets, the Old Dominion Power Plant, will be built in Cecil County. This source will emit 505 tons of NO_x per year or about 1.38 tons per day of NO_x. As Cecil County is a severe ozone nonattainment area, the new source will need to secure emissions offsets at a 1.3 to 1 ratio resulting in an additional 0.32 tons per day emission reductions to Cecil County. Although the offset produces emissions reductions the same as a RACM measure would, special circumstances prevent labeling it a RACM.

2. Additional Stationary Source Reductions

For a number of years, the MDE has studied control measures for all air pollution sources in an effort to attain the federal ozone standard. In particular, the MDE has worked with other states in the region and within the guidelines of the CAA in an effort to ensure that all reasonable measures were considered. Historically, the MDE has worked closely with industries to develop RACT (Reasonably Available Control Technology) assessments in an effort to reduce emissions from stationary sources. MDE has consistently and repeatedly reviewed periodic emission inventories to identify significant source categories and potential control measures. MDE also reviews current air quality control literature SIPs from other nonattainment areas, and applicable websites for advances in control technologies. MDE evaluates new controls for applicability to Maryland sources.

Currently, the MDE is working with the Ozone Transport Commission (OTC) to develop control strategies for stationary and area source controls for the SIP to meet the emission reduction shortfall identified for the attainment plan by EPA and to provide additional reductions for clean air progress. These two processes represent a strong effort from Maryland in reviewing all potential control measures for inclusion in the SIP for attainment. Therefore, MDE believes that through these processes, potential RACM for stationary sources have been reviewed.

3. OTC Measures

The Need for Additional Reductions

In October 1998, the Ozone Transport Commission (OTC) adopted a Declaration of Principles that establishes a framework to further address the ground-level ozone problem in the Ozone Transport Region (OTR). The framework includes initiatives such as regional reductions in emissions of nitrogen oxides (NO_x), considering multi-pollutant

reduction benefits when adopting ozone strategies, and emphasizing regional strategies to attain the ozone standard in the OTR.

In December 1999, the U.S. Environmental Protection Agency (EPA) proposed approval of the attainment plans for ten nonattainment areas. EPA identified emission reduction shortfalls in attainment plans in several of these areas. EPA indicated it would grant states additional time to implement new measures if those states pursued a regional approach to develop control strategies. Within this context, the OTC agreed to begin addressing the emission shortfalls by developing model rules for its member states. These model rules would provide a consistent framework for air pollution regulation throughout the OTR.

Candidate Control Measures

The OTC developed a list of candidate control measures to be investigated. The candidate control measures were divided into two groups: first, those that would be investigated by February of 2001 as short term measures for early adoption (Table 1 Measures), and second, those of a more complex nature, that would be investigated at a later date, i.e., by February 2002 (Table 2 Measures). These measures would help to attain and maintain the one-hour ozone standard, as well as make progress toward attaining the eight-hour ozone standard.

The measures listed below are identified as either "Table 1" or "Table 2" measures.

Table 1 measures are designed to limit emissions from:

1. Architectural and industrial maintenance coatings;
2. Consumer products (including portable fuel containers);
3. Mobile equipment repair and refinishing operations;
4. Solvent cleaning operations;
5. Fuels for on-road vehicles and off-road equipment (diesel and/or gasoline); and,
6. Fuel combustion sources, including cement kilns, gas turbines, stationary internal combustion engines, and industrial boilers.

Table 2 measures may be traditional control measures or innovative control approaches to reduce emissions of multiple pollutants. Measures under consideration include:

1. System benefit charges for electricity generation;
2. Environmental performance standards for electricity generation;
3. State actions to encourage energy conservation;
4. Renewable energy programs;
5. Energy efficiency programs;
6. Airport and aviation emission reduction programs;
7. Off-road engine and vehicle initiatives; and,
8. Other programs to be identified by June 2001.

State-led Workgroups

The Table 1 Measures were researched by groups of OTC member states (workgroups) convened by designated lead state representatives. As the workgroups gathered information, they sought input from the regulated community and other stakeholders in developing draft model rules. For each of the Table 1 measures, a draft model rule, or a framework for a draft model rule, was then developed. Once the workgroups completed draft model rules, the OTC Committees convened to review them and take oral and written comments from stakeholders.

In March 2001, the OTC will focus on the Table 2 measures, and state-led workgroups will follow a similar process to develop Table 2 draft model rules.

Application to RACM

During the process described above, the OTC states used a long list of potential measures to ensure that the shortfall would be properly addressed. This long list was shortened (Tables 1 and 2 discussed above) based on: credits, cost, politics, and stakeholder review. This process parallels the RACM process in reviewing cost and credits estimates for attainment. Based on these criteria, the most reasonable programs are being implemented in a short timeframe.

The following is a summary of the process and exemplifies its connection to RACM issues:

1. A wide list of potential measures was reviewed.
2. The measures were deemed reasonable based on economics and credit potential
3. Speed of implementation and political status were closely reviewed when determining the most effective measures.

4. RACT Process

In addition to the above, Maryland has been involved in the RACT process for stationary sources. This process, calling for regulations to implement Reasonably Available Control Technologies for stationary sources that produce 25 tons per day or more of NO_x and/ or VOC's, has been utilized in Maryland since the early 1990's. Within this process, which involves stakeholders and state experts on source controls, reasonable control technologies are reviewed and decided upon and regulations are developed to ensure that RACT agreements are enforced. Cost effectiveness and technical circumstances are two of the most critical decision factors in the RACT process.

Appendix A
EPA Guidance Documents

Appendix B
List of New Castle County TCM's

The following is a list of the TCMs reviewed by New Castle County, Delaware, as part of a TCM analysis project (for conformity purposes). The benefits identified pertain only to New Castle County and are draft numbers from a WILMAPCO document. These are draft calculations and are not to be used out of context. The TCM numbers in this chart align to the 16 total TCMs listed in section 3.0 of this report.

Potential TCM Benefits for New Castle County

<i>TCM #</i>	<i>TCM</i>	<i>NOx Benefit in Tons/ per day</i>	<i>VOC benefit in Tons/ per day</i>
1 and 6	Improved Transit	0.0114	0.0065
1 and 6	Bus Replacement	0.0004	0.0001
2 and 8	HOV Restrictions	0.0189	0.0107
3	TMP's	0.0164	0.0092
4	Trip Reduction Ordinances	0.0000	0.0000
5	Traffic Flow Improvements	0.1688	0.6190
9, 10, 14, 15	Pedestrian and Bicycle	0.0017	0.0017
7	Control of Vehicle Idling	0.0026	0.0005
16	Pre 1980 Vehicle Reductions	0.1249	0.0720
Totals		0.35	0.72

Appendix C
Cecil County RACM Chart

Summary Table: Strategies Evaluated for Cecil County RACM Determination

The following measures were selected for evaluation in Cecil County. The measures were originally identified as potential RACM in the Baltimore Region.*

#	Strategy	VOC (tpd)	NOx (tpd)	Relevant Factors	RACM?	Reason
1	Accelerated phase-out of diesel buses; replace with cleaner fuels such as natural gas	--	--	MDOT is funding effort to replace MTA buses. Expensive turn in less than 5 years, takes 12+ years to replace fleet at normal replacement rate.	No	High cost. Timing of replacement. Implementation issues (reliability, maintenance, safety)
5	Cash for Clunkers (pre-1975)	0.0609	0.0362	Transient benefits	No	Transient benefits
6	I/M for diesel vehicles and/or roadside pull over testing of diesels	--	--	Technical and cost limitations. Questionable benefits for NOx/VOC, primarily for PM; pull over testing for heavy duty diesels in place	No	Technical and cost limitations
7	CARB diesel fuel	--	--	Difficult to isolate Maryland in regional market; new diesel rules	No	Difficult to isolate Maryland in regional market; benefits do not exceed new diesel rules
8	Bus engine upgrade	0.000	0.000	Low benefits, questionable benefits for NOx/VOC, primarily for PM	No	Does not advance attainment date
9	Revise local zoning and other codes for parking to insure paid transit and cash-in-lieu of parking incentives	--	--	Requires local zoning changes. Not in timeframe for attainment.	No	Cannot be implemented in timeframe to advance the attainment date
10	Parking cash out, tax credit incentives for employers and employees, subsidies of transit fares	0.011	0.034	1994 TCM Technical Review Committee Cost = \$26,896,900 2001 analysis used private sector (CA); difficult know # rented spaces, new practice; union issues	No	Does not advance attainment date
11	Mandatory Employer Cash-Out Subsidy for Transit/HOV	--	--	Requires legislation; political infeasibility.	No	Cannot be implemented in timeframe to advance attainment date
12	Flexible Work Week/Four Day Work Week	0.0135	0.0209	Uncertainty in decrease in trips. Already substantially implemented where applicable.	No	Does not advance attainment date; Cost
13	Financial Incentives for Telework Programs	0.0036	0.0056	High cost.	No	Does not advance attainment date; Cost
15	Home-based telecommuting	0.0252	0.0653	Need funding for outreach	No	Low emission benefits due to underutilization

#	Strategy	VOC (tpd)	NOx (tpd)	Relevant Factors	RACM?	Reason
17	Congestion Pricing on Low Occupancy Vehicles	0.0012	0.0031	Requires legislation. Questionable political feasibility. Questionable equity impacts.	No	Does not advance attainment date Implementation issues
18	Build (Implement) HOV Network in the Freeway System	0.0097	0.0257	Political infeasibility for early implementation. Corridor study underway.	No	Cannot be implemented in timeframe to advance attainment
19	Vanpool Improvement Program	0.0133	0.0204	Some aspects requires legislation; administratively burdensome.	No	Does not advance attainment date Implementation issues
20	Integrated Ridesharing Measures	0.0031	0.0053	Supports rideshare efforts; not possible to isolate additional benefits	No	Does not advance attainment date Implementation issues
21	Regional Vanpool Insurance Program	--	--	Requires legislation	No	Does not advance attainment date Implementation issues
22	Free Parking for Carpools and Vanpools	0.0016	0.0046	High-impact cost in CBD; low impact emissions for non-CBD (due to lack of parking charges)	No	Does not advance attainment date Implementation issues
23	Advanced Transportation Management System	0.0042	0.0082	Unreliable for credit	No	Does not advance attainment date Implementation issues
26	Improved traveler information services	0.0001	0.0005	NA	No	Does not advance attainment Low emissions benefits
27	Increased Adherence to 55 MPH Speed Limit	0.0173	0.0243	Difficulty in enforcing measure	No	Does not advance attainment date Enforcement issues
29	Modified land development patterns	--	--	(Assumes implementation as mandatory restrictions)	No	Implementation issues; cannot be implemented in timeframe to advance attainment
30	Convenience Commercial Centers in Residential Areas	0.000	0.0001	Local reasons, requires zoning changes, lengthy public process	No	Does not advance attainment date Implementation issues
31	Graduated Tax on Vehicle Mileage	0.0154	0.0462	Requires legislation; political infeasibility	No	Does not advance attainment date Implementation issues
32	Pollution Fee for Gasoline Powered Motor Vehicles	--	--	Requires legislation; political infeasibility	No	Does not advance attainment date Implementation issues
33	Increase Gasoline Taxes by \$0.75 per Gallon	--	--	Requires legislation; political infeasibility	No	Does not advance attainment date Implementation issues
34	Market-based Parking Charges for Federal Facilities	--	--	Requires federal action	No	Does not advance attainment date Implementation issues
35	Graduated Additional Vehicle Registration Fee	--	--	Requires legislation; political infeasibility	No	Does not advance attainment date Implementation issues
36	Highway Ramp Metering	--	--	Low/no emissions benefits; merely relocates congestion; public opposition; requires substantial public education; equity concerns	No	Does not advance attainment date Implementation issues

#	Strategy	VOC (tpd)	NOx (tpd)	Relevant Factors	RACM?	Reason
41	Restrict New Parking Construction	--	--	Local issues, zoning timeframes, backing, bank requirements, changes in banking structure	No	Does not advance attainment date Implementation issues
42	Control Student Parking at High Schools	0.0066	0.0086	Non-ozone season; political infeasibility.	No	Does not advance attainment date Implementation issues
44	Free Rail Fares between 10 AM and 3 PM Weekdays	--	--	High cost.	No	Does not advance attainment date Implementation issues
45	Reduced or zero transit fares	--	--	Farebox recovery requirement; requires legislation to change.	No	Cannot be implemented in timeframe to advance attainment Implementation issues
46	Free Transit Passes to Students	--	--	Farebox recovery requirement. Discounted pass program in place	No	Does not advance attainment date Implementation issues
48	Single Price Public Transit Services	--	--	Farebox recovery requirement.	No	Does not advance attainment date Implementation issues
49	Transit priority treatment	--	--	Timing. Cost. Permanence. Questionable change in ridership	No	Does not advance attainment date Implementation issues
50	Transit Transfer Centers with Extensive Suburban Coverage	--	--	Cost. Timing. Private sector involvement. No build out in time for attainment.	No	Does not advance attainment date Implementation issues
51	Shorter Distances from Bus Stops to Buildings	0.0031	0.0069	Owner costs, route changes, potential bus delays, long planning process, local issues, urban valley effect.	No	Does not advance attainment date Implementation issues
52	Access to Jobs program	--	--	Difficult to quantify; annual funding variability, questionable SOV conversion	No	Does not advance attainment date Low emissions benefits
60	Value pricing	--	--	Political infeasibility; delays in legislation; questionable equity impacts; questionable AQ benefits	No	Cannot be implemented in timeframe to advance attainment Implementation issues
61	Control of Extended Idling	0.0103	0.0272	Requires legislation.	No	Cannot be implemented in timeframe to advance attainment Implementation issues
65	Regional Telework Centers	0.0008	0.0024	No demonstrated market demand for telecenters; high cost	No	Does not advance attainment Low emissions benefits
66	Guaranteed Ride Home program	0.0004	0.0009	Isolated program not as effective as comprehensive program	No	Does not advance attainment Low emissions benefits
67	Encourage Use of Alternatively Fueled Vehicles; ATV Program	0.0013	0.0044	Range (0.01-0.25 (2005) VOC; 0.034-0.085 (2005))	No	Does not advance attainment date Low emissions benefits

#	Strategy	VOC (tpd)	NOx (tpd)	Relevant Factors	RACM?	Reason
73	ENDZONE Partners Program (Clean Air Partners) Mobile Emissions	0.0154	0.0493	Voluntary Program	No	Does not advance attainment date Low emissions benefit
74	ENDZONE Partners Program (Clean Air Partners) Non Road Emissions	0.0026	0.0003	Voluntary Program	No	Does not advance attainment date Low emissions benefit
78	Telework Partnership with Employers Program	0.0051	0.0252	Commitment only to 2002	No	Does not advance attainment date Low emissions benefit
88	Land use: infill redevelopment, TOD	--	--	Difficult to quantify projects; annual variability;	No	Cannot be implemented in timeframe to advance attainment Implementation issues
89	Incentives for Mixed Uses at Transit Stations	--	--	Difficult to quantify projects; annual variability	No	Does not advance attainment date; may not be implemented in timeframe to advance attainment
90	Live Near your Work	--	--	NA	No	Does not advance attainment date Low emissions benefit
91	Neighborhood Conservation Program	--	--	Not possible to quantify projects; annual variability	No	Does not advance attainment date Low emissions benefit
92	Smart Growth Transit Programs	--	--	Not possible to quantify projects; annual variability	No	Does not advance attainment date Low emissions benefit
93	Transit Station Smart Growth Initiative	--	--	Not possible to quantify projects; annual variability	No	Does not advance attainment date Low emissions benefit
102	Build P&R Lots Near Selected Major Highway Intersections and Along HOV Facilities	0.0005	0.0169	Assumes 6 lots on freeway approaches. Level of utilization of projected lots does not yield significant emissions reductions in 2005 timeframe.	No	Does not advance attainment date Low emissions benefits
104	Discounted pre-paid transit fare instruments, reduced transit fares, and fare free zones	--	--		No	Does not advance attainment date Implementation issues

* Further information on these measures can be found in “*Reasonable Available Control Measure (RACM) Analysis for the Baltimore Region*” at www.mde.state.md.us/arma/Programs/Aqplan/sip. The measures retain the numbering from the Baltimore analysis for ease of identification and reference.