

Cape Cod



2007 Regional Transportation Plan
Appendix
Air Quality Conformity

April 2007

*Prepared by CAPE COD COMMISSION Transportation Staff
on behalf of the*

**CAPE COD METROPOLITAN PLANNING
ORGANIZATION:**

**Massachusetts Executive Office of Transportation
Massachusetts Highway Department
Cape Cod Regional Transit Authority
Cape Cod Commission
Barnstable County
Town of Barnstable**

**Towns of Bourne, Sandwich, Falmouth & Mashpee
Towns of Yarmouth, Dennis, Harwich, Brewster & Chatham
Towns of Orleans, Eastham, Wellfleet, Truro & Provincetown**

in cooperation with:

**Massachusetts Department of Environmental Protection
United States Department of Transportation Federal Highway Administration
United States Department of Transportation Federal Transit Administration**

Air Quality Conformity Determination for the Cape Cod Metropolitan Planning Organization

March 30, 2007

A. INTRODUCTION

The 1990 Clean Air Act Amendments (CAAA) require Metropolitan Planning Organizations (MPOs) within ozone non-attainment areas to perform air quality conformity determinations prior to the approval of Transportation Plans and Transportation Improvement Programs (TIPs), and at such other times as required by regulation. Conformity is a way to ensure that federal funding and approval goes to those transportation activities that are consistent with air quality goals. Due to changes to the National Ambient Air Quality Standards for ground-level ozone, and since Massachusetts has been found to be in non-attainment for those standards, a re-determination of conformity is required at this time, as required by Federal Regulations 40 CFR Part 93, and the Massachusetts Conformity Regulations (310 CMR 60.03). Additional detailed information regarding regulatory framework, conformity requirements, latest planning assumptions, and conformity consultation procedures can be found in the 2007 Regional Transportation Plan of the Cape Cod MPO.

B. BACKGROUND

Eastern Massachusetts has been classified as a “non-attainment area” for ozone (O₃). This area includes all of Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Suffolk, and Worcester counties. With this non-attainment classification, the CAAA require the Commonwealth to reduce its emissions of volatile organic compounds (VOCs) and nitrogen oxides (NO_x), the two major precursors to ground-level ozone formation, to achieve attainment of the ozone standard.

On September 6, 2002, the Massachusetts Department of Environmental Protection (DEP) submitted to the Environmental Protection Agency (EPA) a revision to the Massachusetts State Implementation Plan (SIP) that included a revised one-hour ozone attainment demonstration plan for Eastern Massachusetts. This SIP revision included a 2007 mobile source emission budget for the Eastern Massachusetts Ozone Non-Attainment Area. EPA found this budget adequate for conformity purposes on December 6, 2002.

In 2004, two 8-hour ozone non-attainment area designations for Massachusetts – classified as “moderate” – went into effect on June 15th, and were geographically identical to those of the previous one-hour standard: the Boston-Lawrence-Worcester (Eastern Massachusetts) Area, and the Springfield (Western Massachusetts) Area. Concurrent with those designations, EPA announced that the 1-hour ozone standard would be revoked as of June 15, 2005.

In 2005, updated air quality conformity analyses for the eight-hour ozone standard were performed for the 2003 RTPs and 2005-2009 regional TIPs. This was required to avoid a conformity lapse and a resulting potential delay or loss of federal transportation funding. On

June 15, 2005, the Federal Highway Administration (FHWA) – in consultation with EPA New England and DEP – made a positive conformity finding for the eight-hour standard.

In July 2005, the Boston Region MPO proposed in their 2006-2010 TIP a reprogramming of several projects across analysis years. This action required a new conformity analysis to be undertaken. Note: Only the emission totals for the Boston Region MPO and the Eastern Massachusetts Nonattainment area were changed at that time. In March 2007, new emissions analyses for all regions were performed with updated emission factors, and the results are being used to demonstrate conformity for the Cape Cod MPO and all other MPO regions in the Eastern Massachusetts Nonattainment Area.

C. CONFORMITY DETERMINATIONS

In 2003, air quality analyses were conducted on behalf of all the 2007 Regional Transportation Plans (RTPs), the purposes of which were to evaluate the RTPs' air quality impacts on the State Implementation Plan. Conformity determinations were performed to ensure that all regionally significant projects were included in the RTPs.

Accordingly, the Executive Office of Transportation found the emission levels from the 2007 RTP updates to be in conformance with the SIP. The Cape Cod MPO certified that all activities outlined in the 2007 Cape Cod Regional Transportation Plan:

- *will not cause or contribute to any new violation of any standard in any area;*
- *will not increase the frequency or severity of any existing violation of any standard in any area; and*
- *will not delay the timely attainment of any standard or any required interim emission reductions or other milestones in any area*

Timely Implementation of Transportation Control Measures

Transportation Control Measures (TCMs) have been required in the SIP in revisions submitted to EPA in 1979 and 1982. All SIP TCMs have been accomplished through construction or through implementation of ongoing programs. There are no specific Cape Cod TCMs.

DEP submitted to EPA its strategy of programs to show Reasonable Further Progress of a 15% reduction of VOCs in 1996 and the further 9% reduction of NOx toward attainment of the National Ambient Air Quality Standards (NAAQS) for ozone in 1999. Within that strategy there are no specific TCM projects. The strategy does call for traffic flow improvements to reduce congestion and, therefore, improve air quality. Other transportation-related projects that have been included in the SIP control strategy are listed below:

- *Enhanced Inspection and Maintenance Program*
- *California Low Emission Vehicle Program*
- *Reformulated Gasoline for On- and Off-Road Vehicles*
- *Stage II Vapor Recovery at Gasoline Refueling Stations*
- *Tier I Federal Vehicle Standards*

Air Quality Conformity Analysis

The conformity test is to show consistency with the emissions budgets set forth in the SIP. Specific information regarding the analysis methods, latest planning assumptions, and consultation procedures are all detailed in the 2007 RTP. The estimated emissions for the Eastern Massachusetts Ozone Nonattainment Area include all the following MPOs:

- Cape Cod MPO
- Central Massachusetts MPO
- Merrimack Valley MPO
- Boston MPO
- Montachusett Region MPO
- Northern Middlesex MPO
- Old Colony MPO
- Southeastern Region MPO
- Martha's Vineyard Commission*
- Nantucket Planning and Economical Development Commission*

* These regions are considered to be MPOs for planning purposes.

PROCEDURES FOR DETERMINING REGIONAL TRANSPORTATION EMISSIONS

The federal conformity regulations set forth specific requirements for determining transportation emissions. A summary of these requirements and the procedures used for this plan are summarized below:

Demographics, Employment, and Transportation Demand

Specific sources of population, households, employment, and traffic information used in the Transportation Plan have been listed above. Chapter 2 of the Plan presents conditions and characteristics of the existing regional transportation system.

Chapters 2 and 6 of the 2007 Transportation Plan discusses trends and changing demands that various components of the transportation system will serve in the future years. These chapters include discussion of the future roles of the highways, transit, pedestrian, bicycle, and water travel. It also describes the development and evaluation of alternative scenarios that were analyzed to help determine the final recommendations of the Regional Transportation Plan.

Chapter 7 of the 2007 Regional Transportation Plan outlines the specific project recommendations that are set forth in the Transportation Plan for the Cape Cod MPO Region through the year 2030. The recommended projects have been included in the Base and Action networks for the analyses performed for the latest conformity determination of this transportation plan amendment.

Only regionally significant projects are required to be included in the travel demand modeling efforts. The final federal conformity regulations define regionally significant as follows:

Regionally significant: a transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sport complexes, etc., or transportation terminals as well as most terminals themselves) and would be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel.

In addition, specific projects have been exempt from regional modeling emissions analysis. The categories of projects include:

- Intersection channelization projects;
- Intersection signalization projects at individual intersections;
- Interchange reconfiguration projects;
- Changes in vertical and horizontal alignment;
- Truck size and weight inspection stations; and
- Bus terminals and transfer points.

Previous conformity amendments now allow traffic signal synchronization projects to be exempt from conformity determinations prior to their funding, approval or implementation. However, once they are implemented, they must be included in conformity determinations for future plans and TIPs.

The Baseline and Action Networks are composed of projects proposed in the approved Transportation Improvement Programs, and the 2003 Transportation Plan. Projects in the Baseline networks consist of all in-place regionally significant and transportation demand management projects plus all projects where one of the following steps has occurred within the last three years:

- Comes from first year of the previously conforming TIP;
- Completed the NEPA process; or
- Currently under construction or are undergoing right-of-way acquisition.

A listing of the projects that meet these criteria and are included as part of the Baseline and Action networks is shown in Table 1 of the Plan:

Air Quality Conformity Modeled Projects

| Project | Air Quality Attainment Year |
|---|------------------------------------|
| Route 132 Boulevard (Barnstable) | 2010 |
| Bourne Rotary Short Term Improvements [Roundabout retrofit] (Bourne) | 2010 |
| Bourne Rotary Long Term Improvements (Bourne) | 2020 |
| Barnstable, Airport Access Roads-- extend Attucks Lane (Barnstable) | 2020 |
| Yarmouth Road – add lanes (Barnstable) | 2030 |
| Sandwich Road Parkway, 4 lanes and landscaped median | 2030 |

Changes in Project Design since the Last Conformity Determination Analysis

The Commonwealth requires that any changes in project design from the previous conformity determination for the region be identified. The last conformity determination was performed on the 2003 Transportation Plan. Changes which have occurred since this last conformity determination are as follows:

- Conformity must be performed using the newly submitted 2007 mobile source emission budget.
- Conformity must be performed using new emission factors submitted by DEP, which reflect the latest assumptions (i.e., progress of the I/M program, etc.).

Model Specific Information

40 CFR Part 93.111 of the federal regulations outlines requirements to be used in the network-based transportation demand models. These requirements include modeling methods and functional relationships to be used in accordance with acceptable professional practice and reasonable for purposes of emission estimation. On behalf of the Cape Cod MPO, MassHighway has used the methods described in the conformity regulations in the analysis of this Cape Cod 2007 Regional Transportation Plan.

Highway Performance Monitoring System Adjustments

As stated in guidance by EPA, all areas of serious ozone and carbon monoxide nonattainment must use the Federal Highway Administration's Highway Performance Monitoring System (HPMS) to track daily vehicle miles of travel (VMT) prior to attainment to ensure that the state is on line with commitments made in reaching attainment of the ambient air quality standards by the required attainment dates. MassHighway provides HPMS information to DEP. DEP used this information in setting mobile source budgets for Volatile Organic Compounds (VOCs), Oxides of Nitrogen (NOx), and Carbon Monoxide (CO) in all SIP revisions prior to 1997. DEP has since revised its VOC and NOx budgets using transportation demand model runs. However, the models must still be compared to HPMS data since HPMS is at present the accepted tracking procedure as outlined in the regulations.

The conformity regulations require that all model based VMT be compared with the HPMS VMT to ensure that the region is in line with VMT and emission projections made by DEP. An adjustment factor has been developed which compares the 2000 HPMS VMT to the 2000 transportation model VMT. This adjustment factor is then applied to all modeled VOC and NOx emissions for years 2007 through 2030 to ensure consistency with EPA accepted procedures.

$$\frac{\text{2000 HPMS VMT}}{\text{2000 Modeled VMT}} = \text{Adjustment Factor for VOC and NOx}$$

HPMS adjustment factors, calculated on a regional basis, are applied to model output of future scenarios, and occasionally change as base year models are updated or improved. The latest factors for the Eastern Massachusetts Ozone Nonattainment Area are as follows:

| REGION | 2000 HPMS VMT* (miles) | Travel Demand Model Model VMT (miles) | HPMS/Model Conversion Factor |
|-----------------------|------------------------|---------------------------------------|------------------------------|
| Cape Cod | 6,204,000 | 4,763,248 | 1.302 |
| Central Massachusetts | 12,920,000 | 14,533,106 | 0.889 |
| Martha's Vineyard | 219,000 | 159,409 | 1.374 |
| Merrimack Valley | 8,920,000 | 8,563,266 | 1.042 |
| Boston | 59,139,000 | 79,040,650 | 0.748 |
| Montachusett | 5,366,000 | 4,815,154 | 1.114 |
| Nantucket | 108,000 | 56,498 | 1.912 |
| Northern Middlesex | 7,261,000 | 6,907,993 | 1.051 |
| Old Colony | 6,058,000 | 6,590,912 | 0.919 |
| Southeastern Mass. | 14,007,000 | 13,631,934 | 1.028 |

Eastern MA

| | | |
|-------------|-------------|-------|
| 120,202,000 | 139,062,169 | 0.864 |
|-------------|-------------|-------|

*VMT = Vehicle Miles Traveled based on an average day.

Horizon years for transportation model and emissions analysis have been established following 40 CFR 93.106(a) of the Federal Conformity Regulations. The years for which the model(s) were run are shown below:

- 1990 - Milestone Year - This year was established as the original base year in the SIP for calculation of emission reductions of VOCs, NO_x, and CO (This year has become outdated and is no longer represented in the modeling).
- 2000 - Milestone Year – This year is currently being used by the statewide travel demand model as the new base year for calculation of emission reductions of VOCs and NO_x.
- 2007 - Milestone Year
- 2010 - Milestone Year – Attainment year
- 2020 - Analysis Year
- 2030 - Horizon Year – last forecast year of transportation plan

Conformity is demonstrated by showing consistency with the mobile source emission budget for the Eastern Massachusetts Ozone Nonattainment Area.

The Executive Office of Transportation, Office of Transportation Planning estimated the emissions for VOC and NO_x for all areas and all MPOs (emissions for the Boston Region were estimated by MPO staff and were included in the final totals). The VOC mobile source emission budget for 2007 for the Eastern Massachusetts Ozone Nonattainment Area has been set at 86.700 tons per summer day and the 2007 mobile source budget for NO_x is 226.363 tons per summer day. As shown in Tables 1 and 2, the results of the air quality analysis demonstrate that the VOC and NO_x emissions from all Action scenarios are less than the VOC and NO_x emissions budgets for the Eastern Massachusetts Ozone Nonattainment Area.*

TABLE 1
VOC Emissions Estimates for the Eastern Massachusetts Ozone Nonattainment Area
(all emissions in tons per summer day)

| Year | Cape Cod Action Emissions | Eastern MA Action Emissions | Budget | Difference (Action – Budget) |
|-------------|--------------------------------------|--|---------------|---|
| 2000 | n/a | 166.545 | n/a | n/a |
| 2007 | 3.8023 | 61.957 | 86.700 | - 24.743 |
| 2010 | 3.0458 | 49.718 | 86.700 | - 36.982 |
| 2020 | 1.6028 | 29.805 | 86.700 | - 56.895 |
| 2030 | 1.5918 | 28.714 | 86.700 | - 57.986 |

TABLE 2
NO_x Emissions Estimates for the Eastern Massachusetts Ozone Nonattainment Area
(all emissions in tons per summer day)

| Year | Cape Cod Action Emissions | Eastern MA Action Emissions | Budget | Difference (Action – Budget) |
|-------------|--------------------------------------|--|---------------|---|
| 2000 | n/a | 287.877 | n/a | n/a |
| 2007 | 10.2663 | 174.098 | 226.363 | - 52.265 |
| 2010 | 7.6201 | 129.201 | 226.363 | - 97.162 |
| 2020 | 2.0092 | 45.439 | 226.363 | - 180.924 |
| 2030 | 1.4241 | 34.744 | 226.363 | - 191.619 |

D. CONCLUSION

The Cape Cod MPO has conducted an air quality analysis of the 2007 Cape Cod Regional Transportation Plan and its latest conformity determination. The purpose of the analysis is to evaluate the air quality impacts of the Plan on the SIP. The analysis evaluates the change in ozone precursor emissions (VOCs, and NO_x) due to the implementation of the 2007 Cape Cod Regional Transportation Plan. The modeling procedures and assumptions used in this air quality analysis follow guidance from EPA and the Commonwealth and are consistent with all present and past procedures used by the Massachusetts DEP to develop and amend the SIP.

The EOT has found the emission levels from all areas and all MPOs in Eastern Massachusetts – including from the 2007 Cape Cod Regional Transportation Plan – to be in conformance with the SIP according to conformity criteria. Specifically, the following conditions are met:

- The VOC emissions for the Action (build) scenarios are less than the 2007 VOC mobile source emission budget for analysis years 2007 through 2030.
- The NO_x emissions for the Action (build) scenario are less than the 2007 NO_x mobile source emission budget for analysis years 2007 through 2030.

In accordance with Section 176(c)(4) of the Clean Air Act as amended in 1990, the MPO for the Cape Cod has completed its review and hereby certifies that the 2007 Cape Cod Regional Transportation Plan and its latest conformity determination conditionally conforms with 40 CFR Part 93, and 310 CMR 60.03, and is consistent with the air quality goals in the Massachusetts State Implementation Plan.

Public Participation Procedures

Title 23 CFR Section 450.324 and 310 CMR 60.03(6)(h) require that the development of the Regional Transportation Plan, TIP, and related certification documents provide an adequate

opportunity for public review and comment. Section 450.316(b) also establishes the outline for MPO public participation programs. The development and adoption of this program conforms to the requirements of the sections cited above. It guarantees public access to the RTP and all supporting documentation, provides for public notification of the availability of the RTP and the public's right to review the document and comment thereon, and provides a 30-day public review and comment period prior to the adoption of the RTP and related certification documents by the MPO.

On February 27, 2007, an announcement was posted on the Cape Cod Commission's Transportation Information Center on the World Wide Web (www.gocapecod.org) informing the public of its right to comment on this conformity determination. This document was also posted for download. During the 30-day public comment period, no substantial comments were received. This was in order to allow ample opportunity for public comment and MPO review of the draft document. On March 2, 2007 the Cape Cod Joint Transportation Committee voted to recommend that the MPO endorse the document and, subsequently, the Cape Cod MPO endorsed the 2007 air quality conformity determination on March 30, 2007. These procedures comply with the associated federal requirements.

Cape Cod Metropolitan Planning Organization

Endorsement of the Cape Cod 2007 Regional Transportation Plan

Re-Determination of Air Quality Conformity

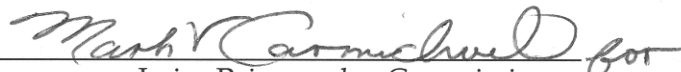
Whereas the 1990 Clean Air Act Amendments (CAAA) require Metropolitan Planning Organizations within ozone non-attainment areas to perform air quality conformity determinations prior to the approval of transportation plans and transportation improvement programs, and at such other times as required by regulation, the Committee of Signatories representing the Metropolitan Planning Organization (MPO) for the Cape Cod Region, in accordance with 23 CFR Part 450 Sections 322 and 324 of the October 28, 1993 Final Rules for Statewide and Metropolitan Planning, hereby endorses the 2007 Regional Transportation Plan (RTP).

Specifically, the MPO for Cape Cod has completed its review in accordance with Section 176(c) (4) of the Clean Air Act as amended in 1990 [42 U.S.C. 7251 (a)], and hereby certifies that implementation of the Cape Cod 2007 Regional Transportation Plan (RTP) satisfies the conformity criteria specified in both 40 CFR Parts 51 and 93 (August 15, 1997) and 310 CMR 60.03 (December 30, 1994). This conformity determination is based on the air quality documentation contained in this RTP and TIP, together with the supplemental document "Air Quality Conformity Determination for the Cape Cod Metropolitan Planning Organization." The RTP continues to include all regionally significant, non-exempt projects as contained in the previously endorsed plan, while the TIP reflects these same projects. Based on the results of the new conformity analyses, both the Cape Cod 2007 Regional Transportation Plan and the Cape Cod Transportation Improvement Program 2007-2010 continue to be consistent with the air quality goals of, and in conformity with, the Massachusetts State Implementation Plan.

SIGNATORY CERTIFICATION:

DATE: 3/30/07


Bernard Cohen, Secretary,
Executive Office of Transportation


Luisa Paiewonsky, Commissioner,
Massachusetts Highway Department

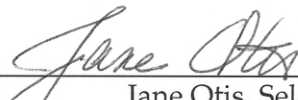

W. Bradford Crowell, Chairman
Cape Cod Commission

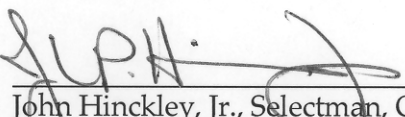
Brian Currie, Chairman,
Cape Cod Regional Transit Authority

William Doherty
Barnstable County Commissioners


Janet Joakim, Chairman
Barnstable Town Council

Wayne Taylor, Selectman, Mashpee
Bourne, Falmouth, Mashpee, Sandwich


Jane Otis, Selectman, Dennis,
Brewster, Chatham, Dennis, Harwich, Yarmouth


John Hinckley, Jr., Selectman, Orleans
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