

## 6.0 Reasonably Available Control Measures (RACM) Analysis

This section provides an analysis and summary of the many control measures applied to reduce in-state emissions of ozone precursors. Because atmospheric transport overwhelms the ability of Connecticut to advance its 8-hour ozone attainment date solely using in-state strategies, Connecticut's attainment demonstration relies heavily on emission reductions from upwind states to increase the probability of attainment of the 8-hour NAAQS by June 15, 2010. While none of the potential measures discussed meet the criteria to be considered RACM because they cannot advance our attainment date, CTDEP has pursued in-state emissions reductions in acknowledgement of the importance of actions in individual states in the region and super-region to better position all States for attainment by the designated attainment date.

### 6.1 RACM Requirements

In accordance with CAA Section 172(c)(1), the "Final Rule To Implement the 8-Hour Ozone National Ambient Air Quality Standard" (the Implementation Rule)<sup>1</sup> requires a state to apply all reasonably available control measures (RACM) that will assist the state in timely attainment of the ozone standard. A RACM analysis traditionally focuses on area, mobile and non-major point sources, and the measures that are considered RACM are those readily implemented measures that are economically and technologically feasible and that contribute to the advancement of attainment in a manner that is "as expeditious as practicable." RACM requires an area-specific analysis, in which the State considers the application of RACM for any source of VOCs or NO<sub>x</sub> within the state borders. The plan to implement these RACM is due June 15, 2007, and is therefore included here with this demonstration of attainment.

A subset of RACM is the reasonably available control technology (RACT) requirements. EPA has defined RACT as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.<sup>2</sup> Unlike RACM, RACT is limited to sources for which EPA has developed Control Technique Guidelines (CTGs) and the major non-CTG sources. As the analytical work for implementing the CTGs is readily available, and because the RACT sources are, *a priori*, a significant focus for implementing control strategies, EPA expects requirements limiting emissions from RACT sources to be addressed more immediately than the other control options. Connecticut submitted its RACT state implementation plan (SIP) to EPA on December 8, 2006. In recognition of Connecticut's longstanding efforts to improve air quality with respect to ozone and its precursor emissions, that SIP submittal included measures that went beyond RACT.

This section provides an analysis of whether or not RACM exist for potential transportation control measures (TCM) for on-road mobile sources and for non-TCM potential control measures for point, area, off-road and on-road categories. Just as it did in the RACM analysis associated with the 1-hour ozone NAAQS attainment demonstration, and for the same reasons, Connecticut concludes, in this analysis, that no potentially available control measures adopted in this state could be considered adequate to advance the attainment date.

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<sup>1</sup> 70 FR 71612; November 29, 2005.

<sup>2</sup> 44 FR 53762; September 17, 1979.

## 6.2 Summary of CT Reasonably Available Control Technology (RACT) Analysis

Section 182 of the CAA sets forth two separate RACT requirements for ozone non-attainment areas. The first requirement, the RACT “fix-up”, calls for the state to correct RACT rules for which EPA identified deficiencies before the CAA was amended in 1990. Connecticut has no such deficiencies to correct. The second requirement calls for the state to implement RACT controls on all major VOC and NO<sub>x</sub> emission sources and on all sources and source categories covered by an EPA-published CTG, the presumptive norm establishing RACT for the covered sources. EPA has also documented alternative control techniques (ACTs) to serve as guidance for controls of VOC and NO<sub>x</sub> emissions from stationary sources. The ACTs describe control techniques and their cost effectiveness, but unlike the CTGs, they do not define RACT. A complete list of the CTGs and ACTs can be found at EPA’s website.<sup>3</sup>

Connecticut submitted a SIP revision to EPA on December 8, 2006 demonstrating that RACT requirements adopted for attainment of the 1-hour ozone NAAQS are sufficient to satisfy RACT for the 8-hour ozone NAAQS. That submission is available on the CTDEP web site.<sup>4</sup> In addition, CTDEP has made progress updating, sometimes exceeding, requirements for some of the RACT and major non-CTG sources to achieve emissions reductions no later than May 1, 2009, as required by the attainment date.

The CTDEP frequently negotiates RACT requirements with individual sources and issues RACT orders. These orders are then submitted to EPA on a case-by-case basis for approval and inclusion into the SIP. Approved RACT orders and other SIP approvals for Connecticut are identified in the U.S. Code of Federal Regulations at 40CFR52.370(c).

### **CTG Category Sources**

For sources for which a CTG has been published, RACT is considered met if a state imposes controls equivalent to the CTG for that source or source category. CTDEP has addressed the majority of the CTG source categories and requirements through three sections of the Regulations of Connecticut State Agencies (R.C.S.A.): 22a-174-20 (Section 20); 22a-174-30 (Section 30) and 22a-174-32 (Section 32). Connecticut demonstrated through its RACT SIP that these regulations are consistent with the CTGs, and therefore meet the RACT requirements. However, Connecticut concluded that two of these categories are appropriate to update. Both the metal degreasing CTG, Section 20(l), and the asphalt paving CTG, Section 20(k), are in the process of being amended. The Department expects the amendments to be implemented by May 1, 2008.

### **Major Non-CTG Sources of NO<sub>x</sub> and VOC.**

The state was required to conduct a RACT analysis for each major stationary source of VOC and for each major stationary source of NO<sub>x</sub>. The guidance in the Implementation Rule gives states the discretion either to conduct individual source-specific RACT determinations or to perform

<sup>3</sup> See: [http://www.epa.gov/ttn/naaqs/ozone/ctg\\_act/index.htm](http://www.epa.gov/ttn/naaqs/ozone/ctg_act/index.htm).

<sup>4</sup> See: <http://www.ct.gov/dep/lib/dep/air/ozone/ozoneplanningefforts/commcoverltr.pdf>.

RACT determinations or certifications collectively for groups of sources. Therefore, emissions averaging or controls applied throughout a group of sources may have been used to show that a particular source group meets RACT. In general, all major sources of NO<sub>x</sub> are regulated under Section 22, while stationary sources of VOC are regulated by Sections 20 and 32. Section 32 explicitly regulates major sources of VOC for the purpose of implementing RACT, and allows the Department to conduct individual RACT analyses for sources.

### **6.3 RACM Analysis for Other Stationary/Area Sources: A Regional Process**

The 1990 CAA amendments recognized the significant role of interstate transport of NO<sub>x</sub> and VOCs in influencing the ability of a downwind state to attain the ozone NAAQS. As part of that recognition, the United States Congress established the Ozone Transport Commission (OTC) to help coordinate control plans for reducing ground-level ozone in the Northeast and Mid-Atlantic states.

As a member of the OTC, Connecticut has worked jointly with the other eleven member states and the District of Columbia to assess the nature and magnitude of the ozone problem in the region, evaluate potential new control approaches and recommend regional control measures to ensure attainment and maintenance of the ozone NAAQS. This regional approach recognizes that all states benefit from coordinated attainment planning efforts to reduce ozone precursors. Connecticut has been an active participant in this regional effort to assess potential attainment measures including RACM/RACT for the 8-hour ozone NAAQS.

The OTC staff and member states formed several workgroups to identify and evaluate candidate control measures. Initially, the workgroups compiled and reviewed a list of over 1,000 candidate control measures. These control measures were identified through published sources such as EPA's Control Technique Guidelines, STAPPA/ALAPCO "Menu of Options" documents, the AirControlNET database, emission control initiatives in other states including California, state/regional consultations, and stakeholder input. The workgroups developed a preliminary list of approximately fifty candidate control measures to be considered for more detailed analysis with respect to the potential for emissions reductions, cost effectiveness, and ease of implementation. These measures were anticipated to be most effective in reducing ozone air quality levels in the Northeastern and Mid-Atlantic States.

Based on the analyses presented by the OTC workgroups, the OTC Commissioners made recommendations to pursue emission reductions from a shortened list of categories. Details of the OTC regional model rules and control measures identified in Table 4.3.2 of the RACT SIP can be found in the OTC technical support document provided as Appendix 6B. Connecticut has already adopted, or is in the process of adopting several of these control measures as part of its 8-hour ozone attainment plan. Those measures for which rule adoption is now proceeding are identified in Table 4.3.2. Table 4.3.2 also indicates those control measures with no applicability to Connecticut or for which development at the regional level continues.

Several measures are available that could provide creditable levels and emissions reductions (see, for example, Section 4.2.2), however, none of these measures, implemented by Connecticut alone, will be sufficient to advance attainment by one year or more. Nonetheless, Connecticut is

pursuing these measures jointly with the OTC in efforts to develop effective controls on the regional level. The 2007 OTC control measures Technical Support Document summarizes the process used to identify and evaluate candidate control measures (see Appendix 6B).

#### **6.4 RACM Analysis for Mobile Sources**

The CTDEP 8-hour ozone attainment demonstration includes a RACM analysis to review potential control measures for on-road mobile sources.

This RACM analysis consists of an evaluation of transportation control measures (TCMs) and their contribution to transportation and air quality planning in Connecticut. It is customary that the statewide transportation planning process in Connecticut includes the identification, evaluation, selection, and implementation of appropriate TCMs. The Connecticut Department of Transportation (CTDOT) produces annual updates to the Statewide Transportation Improvement Program (STIP), documenting projects to be funded under federal transportation programs for a three-year period.

One of the federal funding sources for the STIP is the Federal Highway Administration's Congestion Mitigation and Air Quality (FHWA CMAQ)<sup>5</sup> Program. Funds are used for projects that reduce emissions from vehicles, improve traffic congestion, and/or improve air quality. Some examples of projects eligible for FHWA CMAQ funding are:

- Programs for improved public transit;
- Restriction of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high-occupancy vehicles (HOV);
- Employer-based transportation management plans, including incentives;
- Traffic flow improvement programs that achieve emission reductions;
- Fringe and transportation corridor parking facilities serving multiple-occupancy vehicle programs or transit service;
- Programs for the provision of all forms of high-occupancy, shared-ride services;
- Sections of the metropolitan area to the use of non-motorized vehicles or pedestrian use, both as to time and place.
- Programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of cyclists, in both public and private areas; and
- Employer-sponsored programs to permit flexible work schedules.

CTDOT produces annual FHWA CMAQ reports consisting of details of transportation projects and programs that are considered TCMs and will benefit air quality in Connecticut. The most recent report, "CMAQ2007-10" dated March 2007, consists of a summary of emission benefits achieved in 2007, including a few projects that have construction completion dates in the near future beyond 2007. The following table, Table 6.4.1, was compiled from CTDOT's 2007 emission summary report for the most significant FHWA CMAQ projects and programs.

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<sup>5</sup> This program is conventionally referred to as the CMAQ program, however, in this document, where it is not clearly linked to CTDOT, it is referred to as FHWA CMAQ to distinguish it from EPA's Community Multi-scale Air Quality Program, also known as CMAQ, referenced elsewhere in this document.

**Table 6.4.1: CMAQ2007-10 Emission Summary Report Table**

State Project Number	Project Description	Geographic Area	Total Emission Benefit (kg/d)		
			VOC	NO <sub>x</sub>	PM <sub>2.5</sub>
<b>TRANSIT</b>					
<b>Bus Improvements</b>					
0170-T763	Purchase 7 diesel/electric hybrid buses. Assumption that 3 hybrids will operate in the NY/NJ/CT PM <sub>2.5</sub> non-attainment area is reflected in PM <sub>2.5</sub> benefit calculations.	Statewide	0.22	2.00	0.04
0171-0305	New Britain-Hartford busway that will serve 8 other towns: Berlin, Bristol, Farmington, Newington, Plainville, Southington, West Hartford, and Wethersfield. Project to be complete in 2011.	District 1	9.40	19.90	n/a
0301-0060	New railroad station in Fairfield, potential access from I-95 and Route 1.	Fairfield	7.69	6.95	0.21
<b>Railroad Station Improvements</b>					
0138-0226	Expand current railroad parking capacity by 400 additional spaces.	Stratford	8.38	7.57	0.23
0161-0136	Expand parking capacity.	Wilton	1.95	1.74	0.10
0310-0039	Construct station parking lot, 141 spaces.	Guilford	3.07	2.91	0.09
<b>SHARED RIDE</b>					
<b>Main Regional Rideshare Program</b>					
Various Projects	Programs to encourage van or carpooling. Projects include: 0170-2709, 0170-T714, 0170-2706, 0170-2708, 0170-TX15, 0170-2711, 0170-2707, and 0170-2710.	Statewide	897.39	737.22	7.34
<b>TRAFFIC FLOW IMPROVEMENTS</b>					
<b>Signal System Upgrades</b>					
0155-0160 0155-0161	Traffic signal adjustments and additions.	Statewide	2.73	2.73	n/a
<b>Incident Management System Design &amp; Construction</b>					
0063-0563	Improve the Travel Information Gateway for managing traffic congestion on I-84.	Hartford	30.70	15.05	n/a
<b>DEMAND MANAGEMENT</b>					
Various Projects	Employee Commute Option program to include Telecommuting, Transportation Days and Travel Demand Management Offices (to promote carpooling, vanpooling and public transportation). Projects include: 0170-2713, 0170-2712, 0063-0634, 0092-0600, 0135-0296, 0015-0325, 0034-0326, 0094-0221, and 0151-0306.	Statewide	192.10	386.01	5.47
<b>EXPERIMENTAL PILOT PROJECTS</b>					
<b>Alternate Fuel Vehicles</b>					
0170-2734 0170-2735	Purchase of four alternate fuel vehicles.	Statewide	1.35	7.63	n/a
<b>TOTAL of all projects</b>			<b>1154.98</b>	<b>1189.71</b>	<b>13.48</b>
<b>TOTAL (tons/day)</b>			<b>1.24</b>	<b>1.31</b>	<b>0.01</b>

The following table, Table 6.4.2, was compiled from projects appearing in CTDOT's CMAQ emission summary reports from 2002 to 2006. These projects have provided emission benefits throughout the years leading up to Connecticut's attainment demonstration. These projects have either been completed, resulting in significant air quality improvements, or are no longer funded through FHWA CMAQ resources.

**Table 6.4.2: CMAQ 2002 – 2006 Emission Summary Report Table**

State Project Number	Project Description	Geographic Area	Total Emission Benefit (kg/d)			CMAQ Report Year
			VOC	NO <sub>x</sub>	PM <sub>2.5</sub>	
<b>TRANSIT</b>						
<b>Rail Freight Facilities</b>						
0092-0586	Advancement of the railroad track installation on Waterfront Street and associated utility relocations.	New Haven	0.46	18.44	0.16	2005-09
<b>TRAFFIC FLOW IMPROVEMENTS</b>						
<b>Signal System Upgrades</b>						
Various Projects	Upgrade signal control equipment to a closed loop system. Projects include: 0046-0120, 0048-0180, 0048-0181, 0063-0567, and 0128-0141	Statewide	4.58	4.58	n/a	2005-09
Various Projects	Upgrade signal control equipment to a closed loop system. Projects include: 0007-0178, 0033-0122, 0051-0255, 0051-0256, 0155-0153, 0155-0154, and 0155-0155		16.85	0.85	n/a	2002
<b>Incident Management System Design &amp; Construction</b>						
0014-0170	Construct incident management system on I-95 from exit 56 vicinity to exit 64 vicinity.	Branford	6.11	3.00	0.00	2005-09
0131-0184	Construct incident management system on I-84 in Central Connecticut Region.	Southington	3.91	1.92	n/a	2005-09
0151-0278	Construct incident management system on I-84 in the Waterbury area.	Waterbury	1.03	0.50	0.001	2005-09
0151-0286	Construct incident management system on CT 8.	Waterbury	2.19	1.08	0.002	2005-09
0034-H044	Construct incident management system on I-84 in the Danbury area.	Danbury	6.00	0.18	n/a	2002
0092-0524	Construct incident management system on I-91 in New Haven from I-95 interchange to exit 8.	New Haven	1.70	0.05	n/a	2002
<b>TOTAL of all projects</b>			<b>42.83</b>	<b>30.60</b>	<b>0.17</b>	
<b>TOTAL (tons/day)</b>			<b>0.0472</b>	<b>0.0337</b>	<b>0.0002</b>	

In addition to all the projects included in Tables 6.4.1 and 6.4.2, there are numerous other TCMs that receive FHWA CMAQ program funding that will result in emission reductions. Those not listed in this RACM analysis will lead to emission benefits that have yet to be quantified. A list, as of March 30, 2007, of all planned TCM projects from the 2007 STIP is included as Appendix 6A.

In conclusion, the State of Connecticut continues to implement all of the major TCMs included in the STIP. While the addition of new TCMs to the STIP could marginally reduce VMT, the level of emission reductions would be minimal compared to the level of emission reductions needed to advance the attainment date for the NY/NJ/CT ozone nonattainment area. Therefore, since inclusion of TCMs in the SIP would not advance the attainment date, they are not considered RACM. However, the State of Connecticut will continue to advocate that cost-effective TCMs be implemented through Connecticut's STIP as a means to further reduce emissions.