ABSTRACT

This document sets out the Connecticut Department of Environmental Protection's (CTDEP's) demonstration of attainment of the 1997 annual national ambient air quality standard (NAAQS) for fine particulate matter less than a nominal 2.5 micrometers in diameter ($PM_{2.5}$). The demonstration has two major components: (1) a description of the national, regional and local control measures that have been or will be implemented to reduce emissions in future years; and (2) air quality modeling and other analyses of air quality and meteorological data to assess the likelihood of reaching attainment by the mandated 2010 attainment deadline.

Only two counties in Connecticut, Fairfield and New Haven, are designated as nonattainment for the annual $PM_{2.5}$ NAAQS. These two counties, along with counties in downstate New York and northern New Jersey, are included by EPA in a single multistate $PM_{2.5}$ nonattainment area based on measured violations in the New York and New Jersey portions of the area. All Connecticut monitors measure compliance with the annual $PM_{2.5}$ NAAQS, with monitored $PM_{2.5}$ levels in Connecticut exhibiting a general downward trend from 2001 through 2006 as a result of control program implementation. Control measures implemented to reduce emissions of $PM_{2.5}$ and its precursors are identified, including reasonably available control measures, as required by Section 172(c)(1) of the Clean Air Act.

Results of the analyses described in this attainment demonstration lead CTDEP to conclude that attainment in the New York-New Jersey-Connecticut nonattainment area will be achieved by the April 2010 attainment date. Air quality modeling of emissions, grown and controlled to 2009, monitored data trends, plus other evidence of forthcoming emission reductions indicate that the previously non-attaining air quality levels in New York City and northern New Jersey will reach compliant levels by the April 2010 attainment date.

Connecticut's continued monitored compliance with the annual $PM_{2.5}$ NAAQS and the anticipated attainment by 2010 throughout the multistate area should not be taken as evidence that no air challenges remain. Those small accomplishments for $PM_{2.5}$ belie the seriousness of the remaining challenges and the urgent need, in light of mounting public health data, for additional air quality improvements to address other persistent public health and environmental problems. The emission control strategies described within this SIP revision not only serve to demonstrate attainment for the 1997 annual $PM_{2.5}$ NAAQS but also to position Connecticut to reduce future levels of greenhouse gases, daily $PM_{2.5}$, ozone precursors and air toxics; improve visibility and support environmental justice initiatives.

EXECUTIVE SUMMARY

Overview

This document sets out the Connecticut Department of Environmental Protection's (CTDEP's) plan for attaining the 1997 annual national ambient air quality standard (NAAQS) for fine particulate matter less than a nominal 2.5 micrometers in diameter ($PM_{2.5}$). The plan has two major components: (1) a description of the national, regional and local control measures that have been or will be implemented to reduce emissions in future years; and (2) air quality modeling and other analyses of air quality and meteorological data to assess the likelihood of reaching attainment by the mandated 2010 attainment deadline.

Only two counties in Connecticut, Fairfield and New Haven, are designated as nonattainment for the annual $PM_{2.5}$ NAAQS. These two counties are included by the U.S. Environmental Protection Agency (EPA) in a multistate $PM_{2.5}$ nonattainment area that includes ten downstate New York counties and ten northern New Jersey counties. This multistate area is classified by EPA as nonattainment for the 1997 annual $PM_{2.5}$ NAAQS based on measured violations in the New York and New Jersey portions of the nonattainment area; all Connecticut monitors measure compliance with the annual $PM_{2.5}$ NAAQS.

Results of the analyses described in this attainment demonstration lead CTDEP to conclude that attainment in the New York-New Jersey-Connecticut (NY-NJ-CT) nonattainment area will be achieved by the April 2010 attainment date. Air quality modeling of emissions, grown and controlled to 2009, monitored data trends, plus other evidence of forthcoming emission reductions indicate that the previously non-attaining air quality levels in New York City and northern New Jersey will achieve compliance by the April 2010 attainment date.

Particulate Matter and Public Health

The anticipated attainment of the 1997 annual $PM_{2.5}$ NAAQS is significant from the vantage of public health. The annual average and 24-hour average $PM_{2.5}$ NAAQS were established by EPA based on the results of numerous studies implicating exposure to elevated levels of $PM_{2.5}$ as a factor in many serious health problems, including:

- premature mortality,
- aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions, emergency room visits, absences from school or work, and restricted activity days),
- decreased lung function and difficulty breathing,
- asthma attacks, and
- certain cardiovascular problems such as heart attacks and cardiac arrhythmia.[1, 2]

Individuals particularly sensitive to $PM_{2.5}$ exposure include older adults, children and people with pre-existing respiratory and cardiac disease.[3]

Although fine particulate matter from all sources contributes to adverse health effects, particulate matter emitted from diesel engines is particularly troublesome, for three reasons: (1) diesel engines emit toxic air pollutants along with direct $PM_{2.5}$ and NOx; (2) many ultra-fine particles are produced; and (3) emissions tend to be emitted near ground-level and are concentrated in urban areas. Control measures that target diesel engine emissions are, therefore, particularly important to addressing public health impacts of $PM_{2.5}$.

[1] 72 FR 20586-87 (April 25, 2007).
[2] EPA. Air Quality Criteria for Particulate Matter. United States Environmental Protection Agency, Research Triangle Park, North Carolina: National Center for Environmental Assessment—RTP, Office of Research and Development; report no. EPA/600/P–99/002aF and EPA/600/P–99/002bF. October 2004.
[3] 62 FR 38652-690 (July 18, 1997).

EPA has estimated that attainment of the 1997 annual and daily $PM_{2.5}$ standards nationally would prolong tens of thousands of lives and prevent tens of thousands of hospital admissions each year.[4] In addition, these standards would prevent hundreds of thousands of doctor visits, absences from work and school, and respiratory illnesses in children. Health studies have shown that there is no clear threshold below which adverse effects are not experienced by at least certain segments of the population.

Contextual Issues for Connecticut

Recognition of the relationship between public health and air quality is necessary to provide the proper context for this attainment demonstration. Connecticut's continued monitored compliance with the annual $PM_{2.5}$ NAAQS and the anticipated attainment by 2010 throughout the multistate area should not be taken as evidence that the work of air quality improvements is done. Those small accomplishments belie the seriousness of the remaining challenges and the urgent need for additional improvement. For example, Connecticut and other states now face the challenge of meeting the more stringent 2006 daily $PM_{2.5}$ standard of 35 $\mu g/m^3$ and better addressing other persistent public health and environmental problems. The emission control strategies described within this SIP revision not only serve the purpose of demonstrating attainment for the 1997 annual $PM_{2.5}$ NAAQS but also positioning Connecticut to achieve goals for:

- Reducing greenhouse gas emissions to help Connecticut meet its obligations under the State's Global Warming Solutions Act;
- Continuing to reduce direct and indirect $PM_{2.5}$ emissions in an effort to meet the 2006 daily $PM_{2.5}$ standard of 35 $\mu g/m^3$;
- Supporting the State's efforts to meet the commitments in its 8-hour ozone attainment demonstration SIP, submitted to EPA on February 1, 2008;
- Building a foundation for the attainment of the March 27, 2008 revised ozone NAAQS;
- Continuing the State's on-going efforts to reduce emissions of air toxics;
- Achieving the reasonable progress goals and protecting visibility, as set out in the State's soon-to-be-completed Regional Haze SIP; and
- Supporting the State's environmental justice and urban initiatives.

It is within the above context that CTDEP has been developing this $PM_{2.5}$ plan to demonstrate that the entire New York-New Jersey-Connecticut nonattainment area will attain the 1997 annual $PM_{2.5}$ NAAQS by the April 5, 2010 deadline.

Conceptual Model

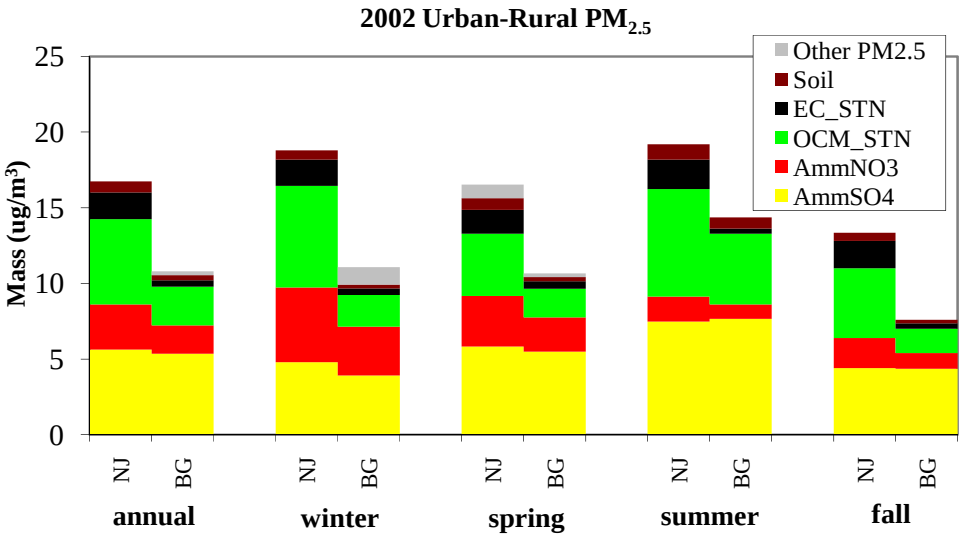
The conceptual underpinnings of this attainment demonstration were developed in a November 2006 report of the Northeast States for Coordinated Air Use Management.[5] That report recognizes two basic concepts concerning $PM_{2.5}$ emissions and ambient levels: (1) emission sources, atmospheric chemistry and meteorological phenomena that influence ambient concentrations of $PM_{2.5}$ pollution act on scales ranging from hundreds to thousands of kilometers; and (2) $PM_{2.5}$ levels are a concern in both summer and winter, with important differences between the meteorological and chemical dynamics determining the levels in the two seasons.

Figure ES-1 illustrates both urban versus rural differences and seasonal differences in the species contribution of $PM_{2.5}$. In general, $PM_{2.5}$ concentrations are lower at the rural monitor sites compared to the urban site. Further, sulfate comprises a greater percentage of the total speciated fine particles at the rural monitor site. The elemental and volatile carbon fractions are greater in the urban areas, likely due to diesel truck traffic and other local combustion sources.

[4] 62 FR 38652-690 (July 18, 1997).

[5] The Nature of the Fine Particle and Regional Haze Air Quality Problems in the MANE-VU Region: A Conceptual Description; NESCAUM; November 2, 2006; See: http://www.nescaum.org/activities/major-reports.

Figure ES-1. $PM_{2.5}$ Species Contribution in the Urban New York Area -- NJ (Elizabeth, NJ) Compared to an Upwind Background Site -- BG (Chester, NJ)



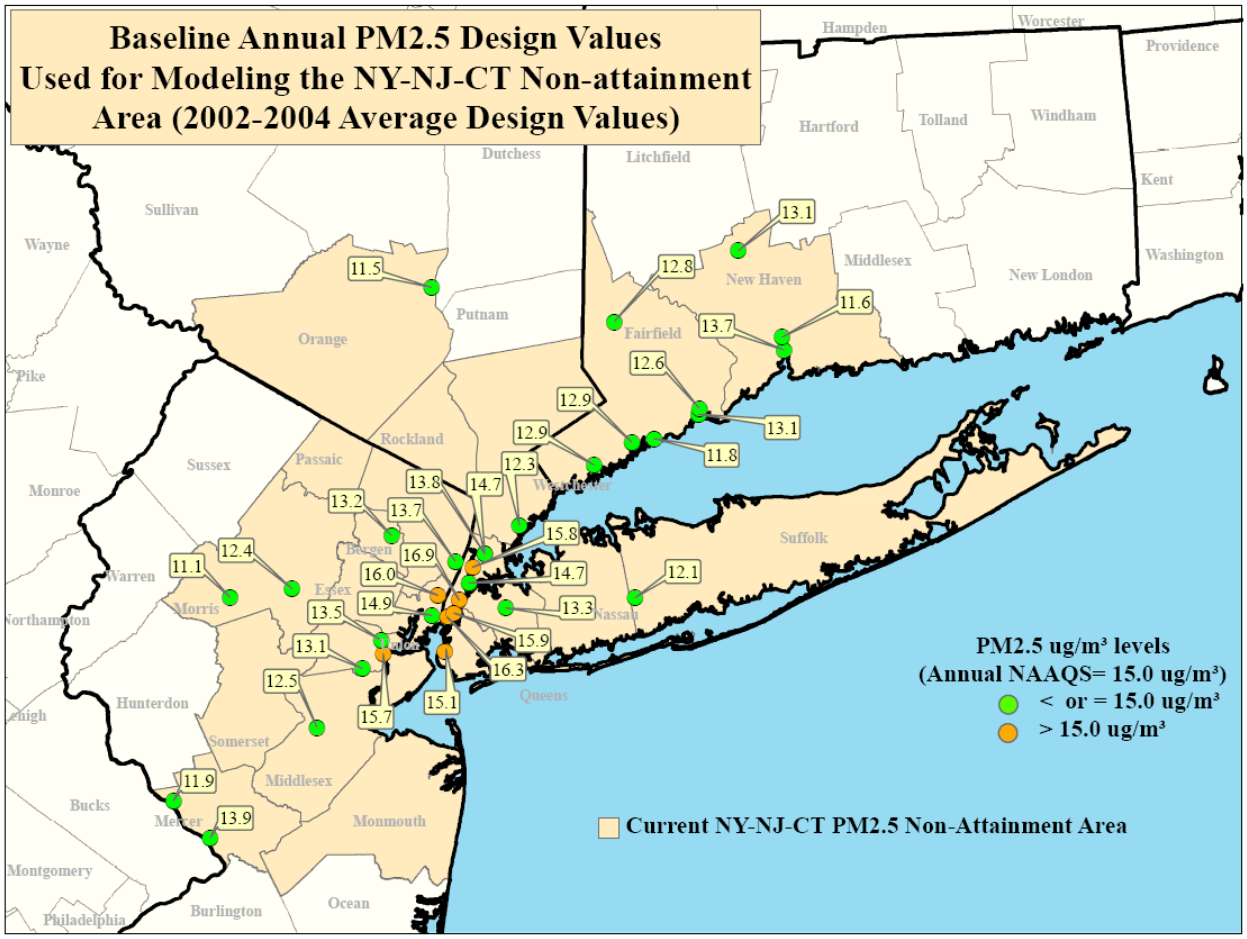
On average, summertime concentrations of sulfate in the northeastern United States are more than twice that of the next most important fine particle constituent, organic carbon, and more than four times the combined concentration of nitrate and black carbon constituents. In the winter, sulfate levels in urban areas are higher than background sulfate levels across the eastern United States, suggesting that the local urban contribution to wintertime sulfate levels is significant relative to the regional sulfate contribution from long-range transport.

These concepts of speciation were used to identify patterns of $PM_{2.5}$ levels in Connecticut and to perform an analysis of highly time-resolved speciated data and meteorology for several high $PM_{2.5}$ events at Connecticut monitoring sites. The implications of this Connecticut analysis to national air quality regulation are two-fold: (1) control measures on electric generating units to the west of Connecticut are necessary to reduce sulfate levels sufficiently during the summer; and (2) control measures on motor vehicles are needed to reduce carbon and nitrate levels in both summer and winter.

Air Quality and Trends

CTDEP's monitoring network currently includes 12 federal reference method $PM_{2.5}$ monitors, nine of which are located at sites in the Connecticut portion of the NY-NJ-CT annual $PM_{2.5}$ nonattainment area. Figure ES-2 shows monitor locations throughout the NY-NJ-CT nonattainment area, along with corresponding baseline design values (representative of the 2000-2004 time period) used in the attainment modeling effort.[6] Baseline design values were less than the annual $PM_{2.5}$ NAAQS at all monitor locations in Connecticut. Several monitors in New York City and northern New Jersey recorded baseline design values exceeding the annual $PM_{2.5}$ NAAQS of 15 µg/m^3, with a maximum measured value of 16.9 µg/m^3 at a monitor located at the PS 59 site on Manhattan Island in New York City.

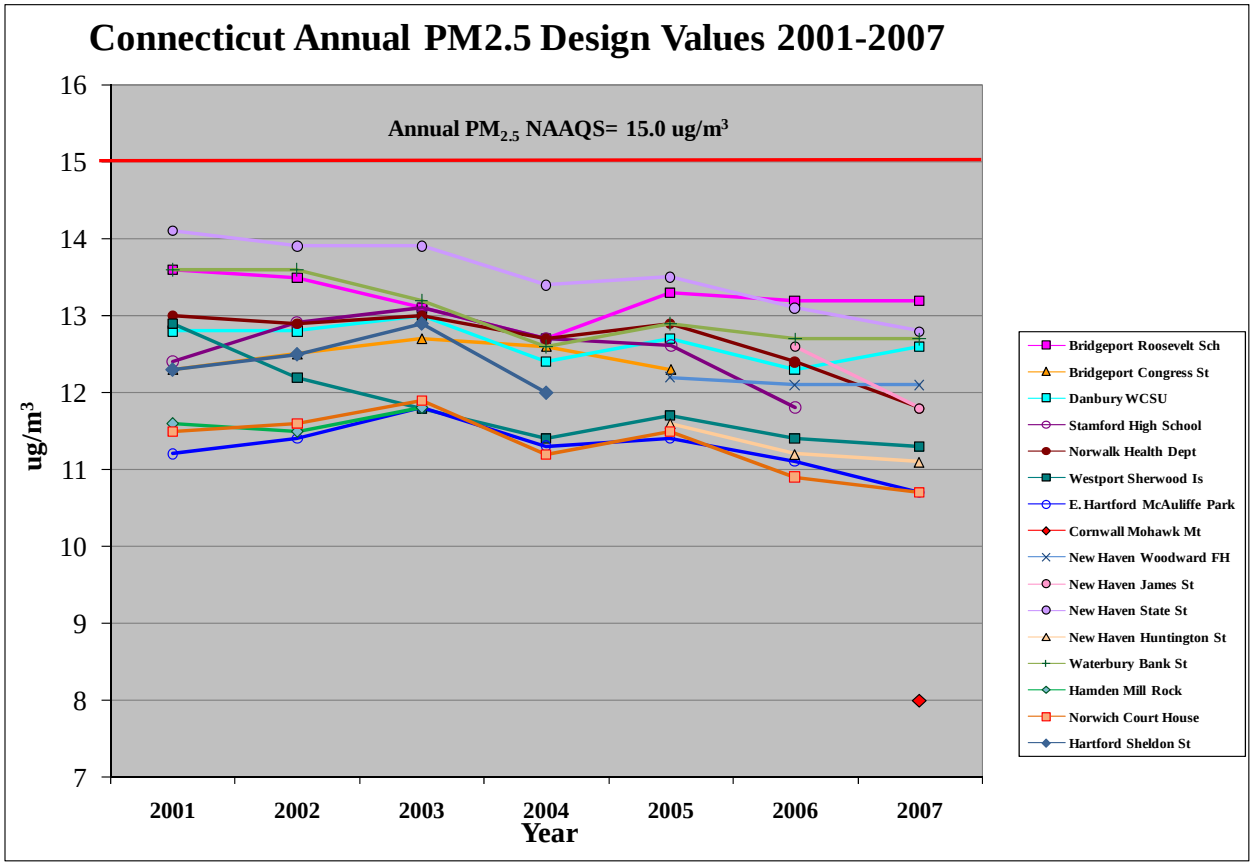
Figure ES-2. $PM_{2.5}$ Monitor Locations and Modeling Baseline Year Design Values



Design value trends are plotted for Connecticut monitors in Figure ES-3 for the period 2001 through 2007. Design values remained in compliance with the annual NAAQS throughout the period at all Connecticut sites, with a general downward trend in $PM_{2.5}$ levels.

[6] See Section 8.4.1 for an explanation of how baseline $PM_{2.5}$ design values were determined for use in the attainment demonstration modeling exercise.

Figure ES-3. Connecticut $PM_{2.5}$ Design Value Trend 2001-2007



Control Measures

Connecticut has a long history of implementing local and regional control measures to reduce NOx and VOC emissions to meet our 1-hour and 8-hour ozone attainment obligations. Similarly, Connecticut has a history of implementing local and statewide measures to reduce particulate and sulfur dioxide emissions to meet particulate matter obligations, including actions under a limited maintenance plan for New Haven. Emissions reductions from these measures, as well as reductions from federal emission control programs, achieved significant reductions in ambient $PM_{2.5}$ levels in Connecticut prior to the 2002 base year. Many of these measures continue to reduce emissions of direct $PM_{2.5}$ and its precursors.

Such previously implemented control measures form the foundation of Connecticut's $PM_{2.5}$ attainment planning and constitute a significant number of Connecticut's reasonably available control measures (RACM). Section 172(c)(1) of the Clean Air Act (CAA) requires states with nonattainment areas to implement all RACM, including those measures requiring the adoption of reasonably available control technology (RACT), as expeditiously as practicable. RACM refers to measures that may be applicable to a wide range of sources, including mobile and areas sources, whereas RACT is a type of RACM specifically designed for stationary sources. This demonstration addresses the requirements of CAA Section 172(c)(1), through (1) an analysis to demonstrate all RACM have been implemented; and (2) a catalogue of measures reducing emissions in Connecticut, RACM or not, that contribute to the predicted attainment in 2010 for the NY-NJ-CT area.

Given Connecticut's currently monitored attainment and the projected attainment of the NY-NJ-CT nonattainment area by 2010, CTDEP concludes its RACM analysis by finding that no new measures are

necessary as RACM. While no new RACM are identified as necessary for this demonstration, a number of measures adopted in the past have contributed to Connecticut's monitored attainment and are considered as RACM. Continuing reductions from such measures plus reductions from non-RACM measures will ensure continued compliance with the NAAQS in Connecticut and attainment in the NY-NJ-CT area.

Table ES-1 lists the pre-2002 control strategies that CTDEP considers RACT and RACM, which were implemented prior to the 2002 baseline year used for the $PM_{2.5}$ emissions inventory and modeling. Table ES-2 identifies the post-2002 control strategies that contribute to the modeled $PM_{2.5}$ attainment in 2009 and hence are considered RACM. The demonstration also identifies additional measures that produce directionally correct emissions reductions. While such measures are not RACM, as they are difficult to quantify, are not federally enforceable and may only slightly advance attainment, CTDEP pursues them as weight-of-evidence leading to the conclusion that attainment in 2010 has been demonstrated.

Table ES-1. Pre-2002 Control Strategies

	Pollutant Controlled			
Control Strategy	**PM**	**NO_X**	**SO_2**	**VOC**
Federal Tier 0 Motor Vehicle Controls		X		X
Federal Tier 1 Motor Vehicle Controls	X	X		X
Federal Low Emission Vehicle Program	X	X		
Federal On-board Refueling Vapor Recovery				X
Reformulated Gasoline – Phases I and II		X		X
Federal Non-Road Control Programs (See Table 4-2 for details of each strategy)	X	X		X
Title IV of the 1990 Amendments to the Clean Air Act (CAA) mandates requirements for the control of acid deposition		X	X	
EPA Wood Stove Certification Program	X			
Control of Open Burning (1983) CGS Sec. 22a-174 (f)	X	X		
Permit to Construct and Operate Stationary Sources RCSA Section 22a-174-3	X	X	X	X
Control of particulate matter and visible emissions RCSA Section 22a-174-18	X			
Control of sulfur compound emissions RCSA Section 22a-174-19			X	
Control of nitrogen oxides emissions RCSA Section 22a-174-22		X		
CT Enhanced I/M (ASM 2525 phase-in standards) RCSA 22a-174-27		X		X
Dispensing of Gasoline/Stage I and Stage II Vapor Recovery RCSA Section 22a-174-30				X
Low Emission Vehicles RCSA Section 22a-174-36		X		X
Standards for Municipal Waste Combustion (Phase 1) RCSA 22a-174-38	X	X	X	

Table ES-2. Post-2002 Control Strategies

	Pollutant Controlled			
Control Strategy	**PM**	**NO_X**	**SO2**	**VOC**
Federal Tier 2 Motor Vehicle Controls/Low Sulfur Gasoline	X	X	X	X
Federal On-board Refueling Vapor Recovery				X
Federal Heavy-Duty Diesel Vehicle Controls and Fuels	X	X	X	X
Federal 2007 Highway Rule	X	X	X	X
Federal Highway Motorcycle Exhaust Emission Standards	X	X		X
Federal Non-Road Control Programs (See Table 4-2 for details of each strategy)	X	X	X	X
Federal CAIR Requirements for SO_2 Sources*			X	
Outdoor Wood Burning Furnace Restrictions Section 22a-174k of the Connecticut General Statutes	X			
General Permit to Construct and/or Operate a New or Existing Distributed Generation Resource	X	X		
Permit to Construct and Operate Stationary Sources RCSA Section 22a-174-3a	X	X	X	X
Improvements in the Control of Particulate Matter and Visible Emissions RCSA Section 22a-174-18	X	X		
Control of Sulfur Dioxide and Nitrogen Oxide Emissions from Power Plants and Other Large Stationary Sources RCSA Sections 22a-174-19a and 22a-174-22(e)(3)		X	X	
Proposed Restrictions on Asphalt Paving Operations RCSA Section 22a-174-20(k)				X
Reduced Vapor Pressure Limitation for Solvent Cleaning RCSA Section 22a-174-20(l)				X
The Post-2002 Nitrogen Oxides (NOx) Budget Program RCSA Section 22a-174-22b		X		
CAIR NO_X Ozone Season Trading Program RCSA Section 22a-174-22c		X		
CT On-Board Diagnostic Inspection & Maintenance Program RCSA 22a-174-27	X	X		X
Pressure-Vacuum Gas Station Vent Valves and Increased Testing for Stage II Controls RCSA Section 22a-174-30				X
Heavy Duty Diesel Engines RCSA Section 22a-174-36a	X	X	X	
CT's California Low Emission Vehicle Phase 2 (CALEV2) RCSA Section 22a-174-36b	X	X		X
Standards for Municipal Waste Combustion (Phase 2) RCSA Section 22a-174-38		X		
VOC Content Limits for Consumer Products RCSA Section 22a-174-40				X
VOC Content Limits for Architectural and Industrial Maintenance (AIM) Coatings RCSA Section 22a-174-41				X
Design Improvements for Portable Fuel Containers RCSA Section 22a-174-43				X
Proposed Restrictions on the Manufacture and Use of Adhesives and Sealants RCSA Section 22a-174-44				X

*****Although federal CAIR SO_2 requirements do not apply to Connecticut, significant emission reductions are anticipated from upwind sources in other states when Phase 1 annual SO_2 budgets take effect in 2010. Some non-modeled early reductions are expected by 2009, which should help the NY-NJ-CT area achieve timely attainment. Note that CTDEP does not necessarily concur with EPA's interpretation that compliance with CAIR satisfies the RACT requirement for all affected sources.

Base Year Emissions and Projections to 2009 and 2012

The baseline emissions inventories, developed from calendar year 2002 emissions, are the cornerstone of future year projections and the attainment demonstration. In light of the regional nature of ozone, $PM_{2.5}$ and visibility problems, states in the Northeast compiled comprehensive multi-pollutant inventories under the coordination of the Mid-Atlantic/Northeast Visibility Union (MANE-VU). Annual county-level inventories were developed for a number of pollutants, including primary $PM_{2.5}$ as well as its significant precursor pollutants, sulfur dioxide (SO_2) and oxides of nitrogen (NOx). The inventories include emissions from stationary, area and mobile sources.

Appropriate growth estimates and control factors, representing federal and state post-2002 emissions control programs (so-called "beyond-on-the-way", or BOTW controls), were applied to the baseline inventory to obtain projected emissions for 2009 and 2012. For mobile source emissions, the NONROAD and MOBILE6.2 (as embedded in the SMOKE software) models were used to develop non-road and highway emission estimates, respectively, using state-specific input data representative of the future year. Appropriate temporal, spatial and speciation allocation profiles were applied to the resulting MANE-VU annual inventory to develop emission inputs required for attainment demonstration modeling purposes.

The resulting emission estimates for Connecticut for the years 2002, 2009 and 2012 are summarized in Figures ES-4 through ES-6 for $PM_{2.5}$, NOx and SO_2, respectively. For 2002, area sources contributed the largest fraction of primary $PM_{2.5}$ (78%), on-road mobile sources were the largest contributors of NOx emissions (57% of the total), with point and area sources contributing the largest fractions of SO_2 emissions (50% and 39%, respectively).

In the future years, primary $PM_{2.5}$ emissions are anticipated to decline slightly between 2002 and 2009 (by 4%), with an additional reduction of 3% by 2012. Projected increases of $PM_{2.5}$ emissions in the point source sector are more than offset by projected decreases in the area, non-road and on-road sectors. More significant changes are anticipated in precursor emissions. Total NOx emissions in Connecticut are projected to decrease from 2002 levels by 30% in 2009 and 41% in 2012. Significant decreases are expected from the on-road, non-road and point source sectors due to federal and state post-2002 control measures. Total SO_2 emissions in Connecticut are projected to decrease by 29% between 2002 and 2009. Reductions are due to low sulfur fuels mandated for on-road vehicles and non-road equipment, as well as new sulfur emission limits for large industrial and electric generating facilities.

In addition to the SIP control strategies included in the MANE-VU modeling inventories, several non-modeled state and federal control programs have or will be implemented that will serve to further reduce $PM_{2.5}$-related emissions by 2010 and beyond, such as: programs to reduce peak electricity demand and increase energy efficiency; diesel retrofit and anti-idling programs; transportation control measures; and certain federal non-road engine regulations.

Figure ES-4. MANE-VU $PM_{2.5}$ Emissions Projections for Connecticut (2002-2012)

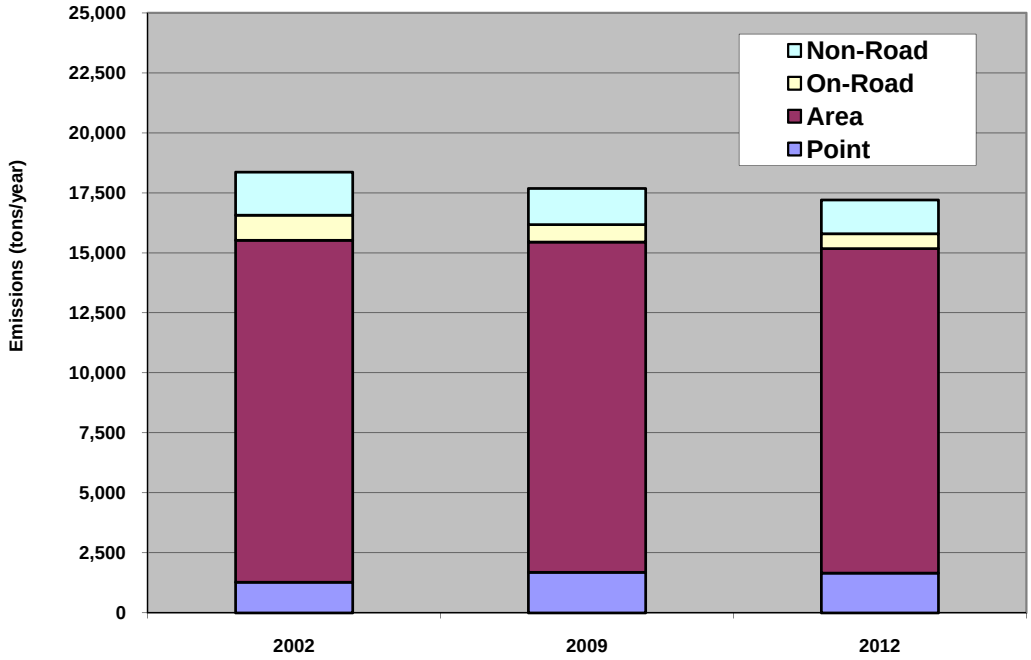


Figure ES-5. MANE-VU NOx Emission Estimates for Connecticut 2002-2012 Beyond-On-the-Way (BOTW) Controls

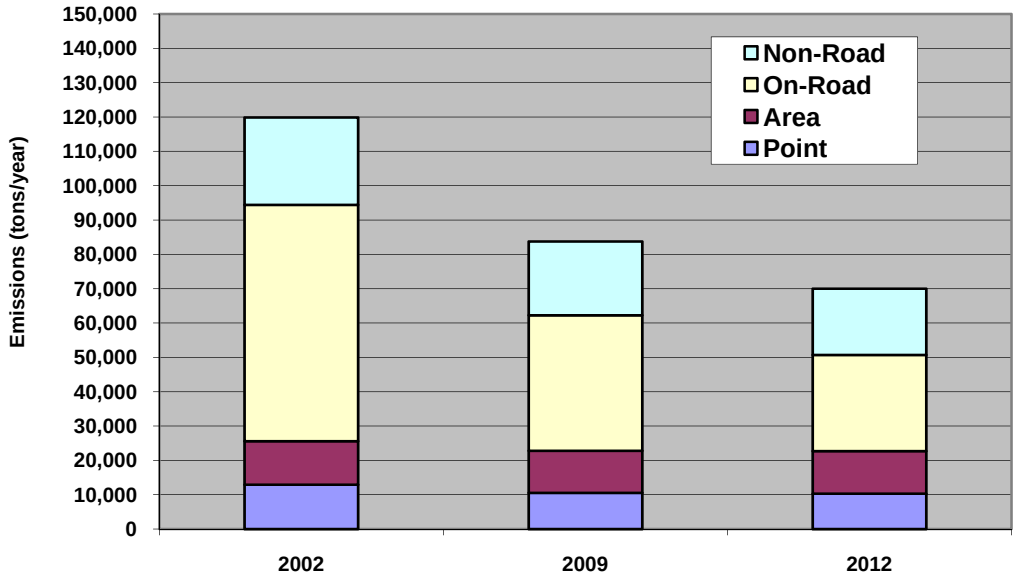
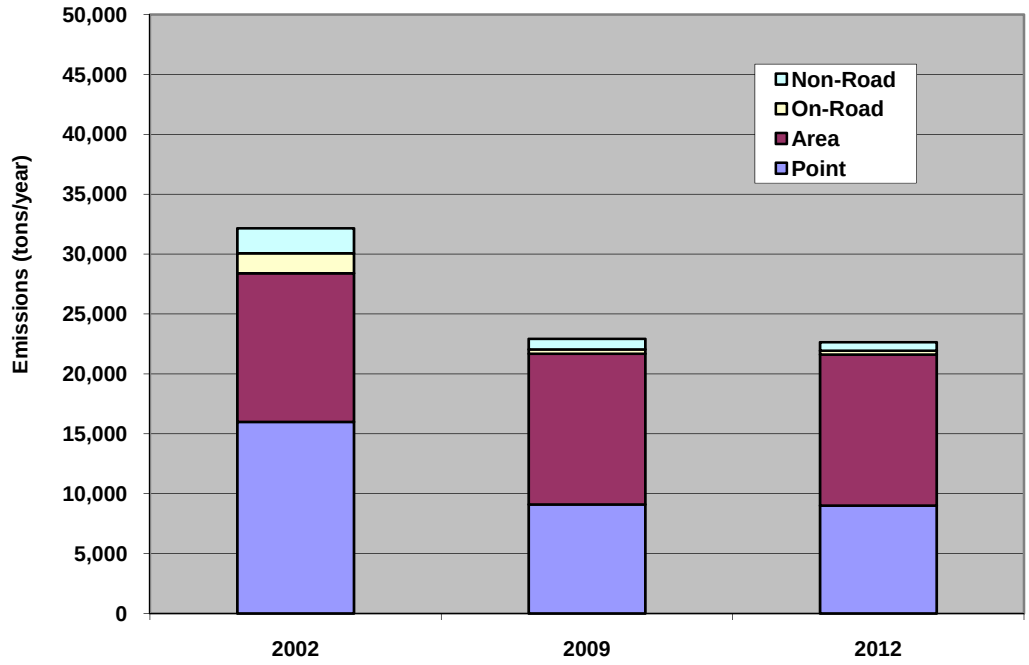


Figure ES-6. MANE-VU SO_2 Emission Estimates for Connecticut 2002-2012 Beyond-On-the-Way (BOTW) Controls



Transportation Conformity Process and Motor Vehicle Emission Budgets

Transportation conformity is a CAA requirement that serves as a bridge to connect air quality and transportation planning activities. Transportation conformity is required under the CAA to ensure that highway and transit project activities receiving federal funds are consistent with ("conform to") the purpose of the SIP. Conformity to a SIP is achieved if transportation programs or transit project activities do not cause or contribute to any new air quality violations, do not worsen existing violations, and do not delay timely attainment of the relevant NAAQS.

CTDEP proposed early $PM_{2.5}$ transportation conformity budgets in April 2007 that were determined by EPA in June 2007 to be adequate for transportation conformity purposes and subsequently approved by EPA in August 2007. Budgets were established for direct $PM_{2.5}$ emissions and for NOx, a $PM_{2.5}$ precursor pollutant, for the required attainment year of 2009. The 2009 budgets, which are summarized in Table ES-4, represent a cap on on-road emissions in the Connecticut portion of the NY-NJ-CT annual $PM_{2.5}$ nonattainment area (*i.e.*, Fairfield and New Haven Counties).

Table ES-4. 2009 Transportation Conformity Budgets for the Connecticut Portion of the NY-NJ-CT $PM_{2.5}$ Nonattainment Area

Annual Direct $PM_{2.5}$ Emissions (tons per year)	Annual NOx Emissions (tons per year)
360	18,279

CTDEP has determined that the previously approved early $PM_{2.5}$ budgets should be retained as part of the $PM_{2.5}$ attainment demonstration SIP, as these budgets account for the effects of the $PM_{2.5}$ mobile source control programs that are included in the attainment demonstration modeling.

Attainment Demonstration and Weight-of-Evidence

Photochemical grid modeling and weight-of-evidence (WOE) analyses, including monitored data trends, were used to assess the likelihood of achieving timely attainment of the $PM_{2.5}$ NAAQS in the NY-NJ-CT nonattainment area. The results of the photochemical modeling and WOE analyses lead CTDEP to two major conclusions:

- There is a high level of probability that the NY-NJ-CT area will achieve attainment of the 1997 annual $PM_{2.5}$ NAAQS by the required April 2010 attainment date; and
- Adopted emission control programs will result in continued reductions in $PM_{2.5}$ and precursor emissions through 2012 and beyond, providing confidence that compliance with the NAAQS will continue once attainment is achieved.

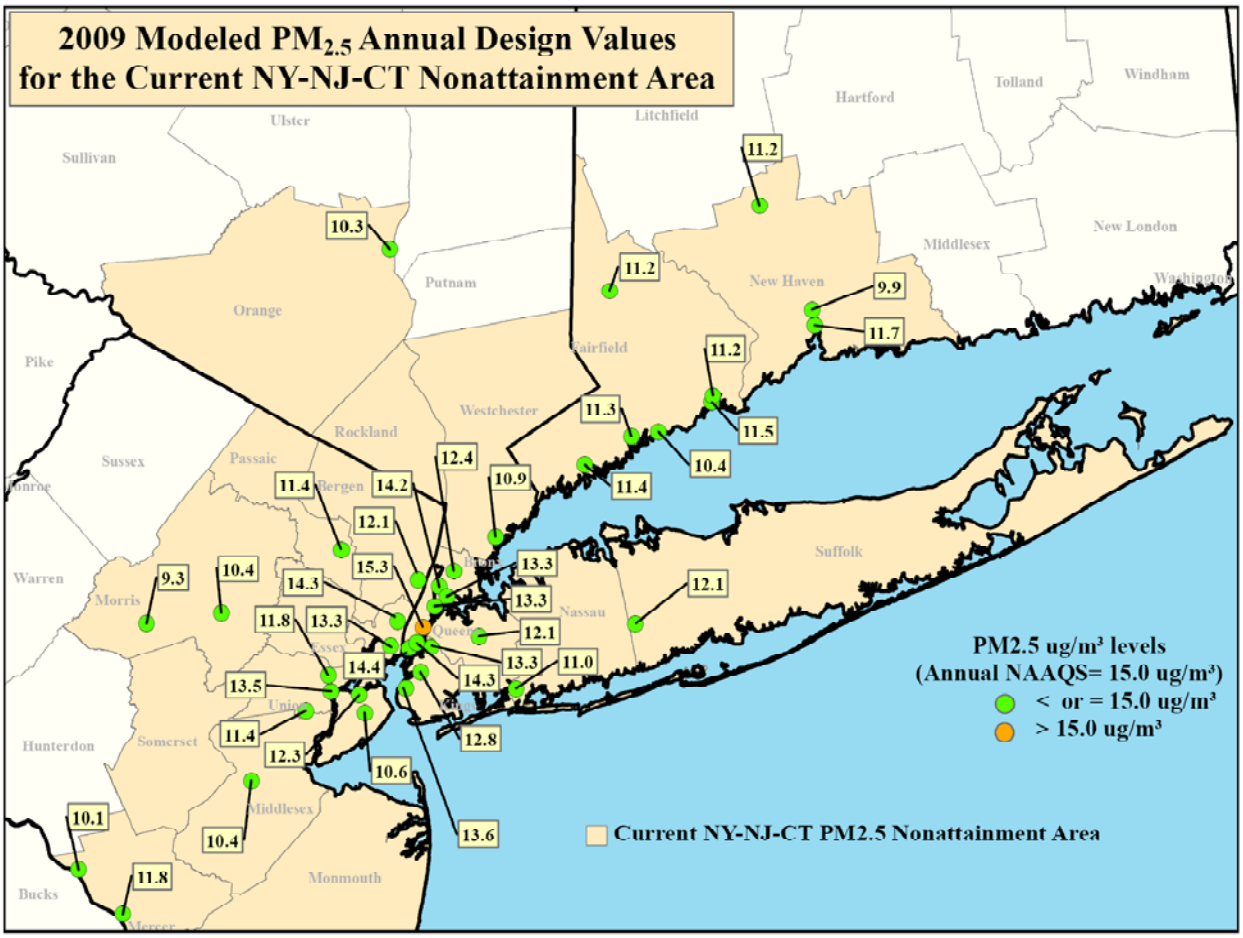
Modeled Design Values Generally Demonstrate Attainment

The photochemical model selected for the attainment modeling demonstration was the EPA's Models-3/Community Multi-scale Air Quality (CMAQ) modeling system. CMAQ was employed to simulate $PM_{2.5}$ for the calendar year 2002 and to develop projections of $PM_{2.5}$ design values for 2009, the last full calendar year before the April 2010 attainment date.

CMAQ modeling projects that all monitors in the NY-NJ-CT nonattainment area, except the PS 59 monitor in New York County (Manhattan), will have annual 2009 $PM_{2.5}$ design values below the modeling uncertainty range, negating the need for weight-of-evidence (WOE) analyses for attaining monitors. Figure ES-7 maps the modeled 2009 design values for monitor locations throughout the nonattainment area. The projected 2009 design value for the PS 59 site is 15.3 ug/m^3, a value within the WOE range of 14.5 ug/m^3 to 15.5 ug/m^3.[7] As a result, corroboratory WOE analyses are needed to demonstrate attainment at the PS 59 monitor. These WOE analyses, summarized below, support the conclusion that the entire NY-NJ-CT nonattainment area will attain the annual $PM_{2.5}$ NAAQS by the April 2010 deadline.

[7] "Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze"; EPA-454/B-07-002; April 2007; Page 17; http://www.epa.gov/scram001/guidance/guide/final-03-pm-rh-guidance.pdf.

Figure ES-7. 2009 Modeled $PM_{2.5}$ Design Values for the NY-NJ-CT Nonattainment Area



Monitoring Data Show General Downward Trend Toward Timely Attainment

Monitored $PM_{2.5}$ and precursor emission data trends are one of two types of WOE analyses used to evaluate the certainty of attainment at the PS 59 site. Monitors throughout the NY-NJ-CT nonattainment area have recorded gradual improvements in annual average $PM_{2.5}$ levels over the last several years. As was shown previously in Figure ES-3, $PM_{2.5}$ levels at Connecticut monitors have consistently been less than the 15.0 µg/m^3 annual NAAQS, with a general downward trend during the period.

Similar downward trends in annual $PM_{2.5}$ levels have been recorded at monitoring sites in the New York and New Jersey portions of the nonattainment area over the 2000 to 2007 period, as displayed in Figures ES-8 and ES-9. Extrapolation of linear trend lines into the future indicates that all monitors in the nonattainment area are likely to achieve $PM_{2.5}$ levels lower than the annual $PM_{2.5}$ NAAQS prior to the attainment deadline. A continuation of the overall downward trend in annual $PM_{2.5}$ concentration levels is supported by emission projections. Significant additional reductions in $PM_{2.5}$ and precursor emissions are expected to occur in the nonattainment area through at least 2012. These results reinforce the conclusion that the NY-NJ-CT area will achieve attainment of the annual $PM_{2.5}$ NAAQS by the April 2010 deadline.

Figure ES-8. Trends in Annual $PM_{2.5}$ Levels in the New Jersey Portion of the NY-NJ-CT Nonattainment Area

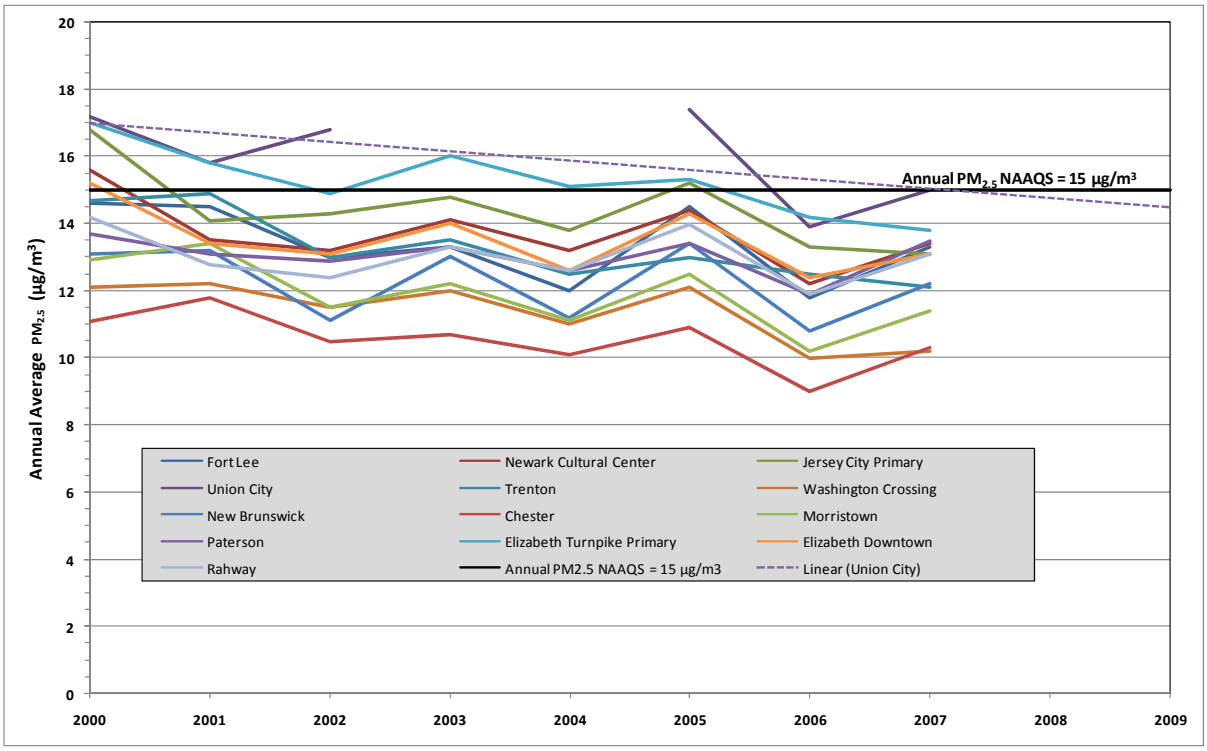
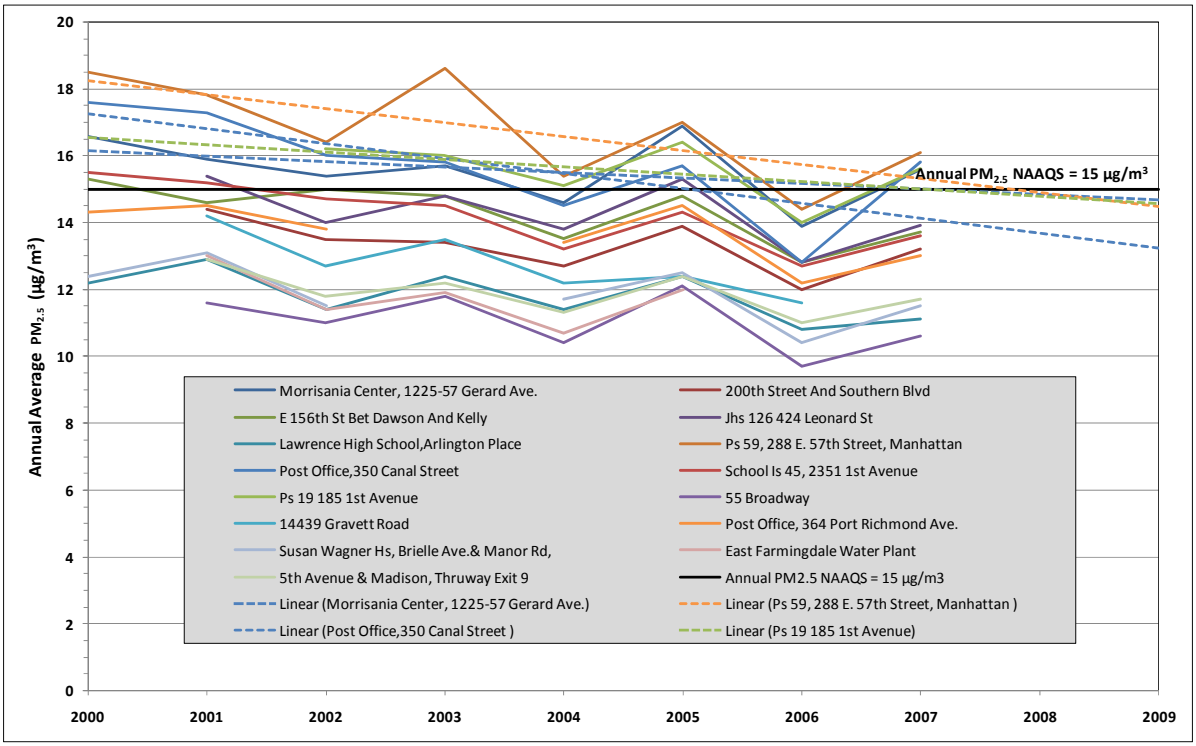


Figure ES-9. Trends in Annual $PM_{2.5}$ Levels in the New York Portion of the NY-NJ-CT Nonattainment Area



Additional Connecticut Control Measures Provide Further Reductions

Emissions reductions from numerous control programs that were not included in the CMAQ modeling or the 2009 MANE-VU emissions inventory are the second type of WOE supporting attainment by the 2010 attainment date. Such supplemental emissions reductions increase the level of confidence that attainment of the annual $PM_{2.5}$ NAAQS will occur by April 2010 throughout the nonattainment area and be maintained into the future. In Connecticut, such additional emissions control programs include energy efficiency measures; diesel retrofit and anti-idling strategies; and transportation control measures.

Other Components of the Demonstration

In addition to the elements summarized above, the attainment demonstration addresses the following information in satisfaction of the CAA and the $PM_{2.5}$ Implementation Rule:

- Reasonable further progress;
- Contingency measures; and
- Infrastructure requirements under CAA Section 110(a)(1) and (2).

Future Actions

As summarized here, attainment of the annual $PM_{2.5}$ NAAQS in the NY-NJ-CT nonattainment area is anticipated by April 2010. In the Connecticut portion of the nonattainment area, compliance with the NAAQS has been monitored continuously since at least 2001. Modeling and weight-of-evidence analyses indicate the remainder of the NY-NJ-CT nonattainment area will comply with the annual $PM_{2.5}$ NAAQS by the April 2010 deadline. Regardless of these small accomplishments for cleaner air, in recognition of the significant public impacts of $PM_{2.5}$, Connecticut is pursuing a range of actions to further limit emissions of direct $PM_{2.5}$ and its precursors and to address urban core issues, thereby allowing Connecticut's residents to breathe easier in years beyond the immediate attainment horizon for the annual $PM_{2.5}$ NAAQS. Connecticut acting alone, however, has limited authority and ability to effect changes in air quality, even within our own state borders. Only concerted efforts at all levels – national, regional and state – can achieve the best environmental future.

To this end, we encourage EPA to adopt additional national and regional emission control programs to ensure that equitable and cost effective progress is made to achieve the 2006 24-hour $PM_{2.5}$ NAAQS. Such programs might include the most stringent possible non-road and on-road emission standards for all mobile source categories; more stringent national limitations on the sulfur content in fuels, including home heating oil; federal or regional standards to address wood burning; and effective programs to further limit emissions from electric generation, including emissions from small and peaking generators operating on the highest electric demand days as well as emissions from large generators located to the west of Connecticut, all of which contribute to summer sulfate emissions.