



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

REGION 1

1 CONGRESS STREET, SUITE 1100  
BOSTON, MASSACHUSETTS 02114-2023

June 29, 2004

Honorable John G. Rowland  
Governor of Connecticut  
State Capitol  
Hartford, Connecticut 06106

Dear Governor Rowland:

Fine-particle pollution represents one of the most significant barriers to clean air facing our nation today. These tiny particles – about 1/30<sup>th</sup> the diameter of a human hair – have been scientifically linked to serious human health problems. Their ability to be suspended in air for long periods of time makes them a public health threat far beyond the source of emissions. An important part of our nation's commitment to clean, healthy air deals with reducing levels of this fine particle or PM<sub>2.5</sub> pollution.

On February 10, 2004, you sent us your recommendations on fine-particle air quality designations. We have thoroughly reviewed your recommendations and the technical information you have submitted to support your recommendations. We appreciate the effort your State has made to develop this supporting information. Consistent with the Clean Air Act, this letter is to notify you that based on the information contained in your submittal, EPA agrees with your recommended designations and boundaries for most counties, but intends to modify your recommended designations and boundaries for some counties, as described in the enclosure discussed below.

Commissioner Rocque will receive a letter with a more detailed enclosure containing a description of areas where EPA intends to modify your State recommendations, and the basis for such modification. Should you have additional information that you wish to be considered by EPA in this process, we request that you provide it to us by September 1.

The State of Connecticut will hear from us again in November when EPA takes the final step in the PM<sub>2.5</sub> designation process and determines those areas that are in attainment and those areas that are nonattainment. For areas in attainment, the challenge will be not only to maintain, but also to continue the progress you have made toward clean air. We wish to ensure that there is no backsliding in the clean air status for fine particles that your state has achieved. This is especially important as your economy grows in the future. EPA will also issue a proposed fine particle implementation rule prior to final designations, which will allow you to proceed with planning to achieve clean air.

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The Bush Administration is addressing fine particle pollution with a comprehensive national clean air strategy. This strategy includes EPA's recent rule to reduce pollution from nonroad diesel engines, and the proposed rule to reduce pollution from power plants in the eastern United States. These two rules are important components of EPA's efforts to help States and localities meet the more protective national fine-particle and 8-hour ozone air quality standards. Together these rules will help all areas of the country achieve cleaner air.

Should your staff have any questions, I invite them to contact David Conroy, Acting Chief of the Air Programs Branch, at 617-918-1661. We look forward to a continued dialogue with you as we work together to implement the PM<sub>2.5</sub> standards.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert W. Varney", with a long horizontal flourish extending to the right.

Robert W. Varney  
Regional Administrator

cc: Arthur J. Rocque, Commissioner, CT DEP  
Anne Gobin, CT DEP



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June 29, 2004

Arthur J. Rocque, Commissioner  
Department of Environmental Protection  
79 Elm Street  
Hartford, CT 06106

Dear Commissioner Rocque:

Today we wrote to Governor Rowland in response to his February 10, 2004 letter with Connecticut's recommendations on air quality designations for the national health-based standard for fine particulate matter (PM<sub>2.5</sub>). In that letter, we noted that we intended to modify Connecticut's recommendations for certain portions of the State. We will continue to work with your office as we move forward to make final designations in November 2004.

As you know, the Clean Air Act (CAA) defines a nonattainment area as any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant. EPA guidance indicates that an entire Consolidated Metropolitan Statistical Area (C/MSA) or the Metropolitan Statistical Area (MSA) is the presumptive boundary for a PM<sub>2.5</sub> nonattainment area if any monitor in the metropolitan area violates the annual PM<sub>2.5</sub> standard. States can recommend a modified area that is larger or smaller than the presumptive boundaries based on nine factors provided in the guidance.

EPA carefully reviewed Connecticut's February 10, 2004 letter and the information submitted to support Connecticut's recommendations for areas that differed from the presumptive boundaries. We appreciate the effort the State has made to develop this supporting information. EPA has carefully considered Connecticut's proposal to classify the violating monitor in New Haven County as a "microscale" site, and to designate the entire State as attainment. Connecticut also offered the opinion that it is not contributing to violations in New York or New Jersey and, therefore, should not be part of the New York City nonattainment area.

Based on an EPA analysis of nine factors (see enclosure), EPA is considering designating Fairfield and New Haven Counties in Connecticut as part of the New York City nonattainment area. Therefore, consistent with section 107(d)(1) of the CAA, we have informed your Governor that, based upon the information available to EPA at this stage in the review process, EPA intends to make modifications to Connecticut's recommended designations and boundaries. Before doing so, however, we want to share our analysis with you and fully consider the State's comments.

We recognize that the Stiles Street monitor is adjacent to an on-ramp to Interstate 95, which carries significant truck traffic. However, EPA is not convinced that this monitor is not representative of the area, and that there are not other high-traffic areas near Interstates 95 or 91 with elevated PM<sub>2.5</sub> levels. In addition, it is difficult for EPA to conclude, based on available information, that these two counties, which are part of the New York-New Jersey-Connecticut C/MSA, should not be included in the New York City nonattainment area.

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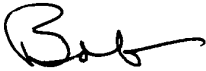
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We recognize that Connecticut considered the nine factors identified in EPA's national designation guidance when developing recommendations. However, EPA believes the information provided to date is not sufficient to justify the conclusion that the entire State of Connecticut should be designated attainment and excluded from the applicable nonattainment area. As we informed your Governor, we invite the State to submit more information by September 1, 2004, supporting its claim that the violating monitor is not representative of a larger area, and that Fairfield and New Haven counties do not contribute to violations in the New York metropolitan area.

We will carefully review any further information Connecticut provides, and will work closely with you in reaching a decision on final designations. If you have any questions, please do not hesitate to call me or David Conroy, Acting Manager of the Air Programs Branch, at 617-918-1661.

Sincerely,



Robert W. Varney  
Regional Administrator

Enclosure

cc: Anne Gobin, CT DEP

## Enclosure

### **9-Factor Analyses for Southern New England for Designation of Nonattainment Areas for Fine Particle Pollution**

The following is a 9-factor analysis for New England counties that are candidates for nonattainment status for the fine particle (PM<sub>2.5</sub>) air-quality standard. EPA guidance establishes the metropolitan area (i.e. the Metropolitan Statistical Area (MSA) or Consolidated Metropolitan Statistical Area (CMSA) where one exists) as the presumptive boundary for PM<sub>2.5</sub> nonattainment areas. (See memo from Jeffrey R. Holmstead to EPA Regional Administrators, April 1, 2003.) OMB issued revised urban-area definitions on June 6, 2003. Although States were not asked to use the 2003 urban-area definitions when recommending PM<sub>2.5</sub> nonattainment areas to EPA, EPA is using the 2003 definitions in its review of State recommendations. Therefore, this 9-factor analysis considers all counties in New England that are in the 2003 New York-Newark-Bridgeport, NY-NJ-CT-PA Combined Statistical Area (CSA), and any counties in New England that are adjacent to this CSA. (A list of the 2003 metropolitan area definitions is available at: [www.census.gov/population/www/estimates/metroarea.html](http://www.census.gov/population/www/estimates/metroarea.html).)

In New England, the New York-Newark-Bridgeport, NY-NJ-CT-PA CSA counties include Fairfield, New Haven, and Litchfield counties in CT. Adjacent counties to the CSA include Middlesex and Hartford counties in CT, and Berkshire and Hampden counties in MA. The only monitor in the New England portion of this CSA that violated the annual PM<sub>2.5</sub> standard based on 2001-2003 data is located in New Haven, CT. Additionally, there are no monitors in the adjacent counties that violated the annual PM<sub>2.5</sub> standard. However, the absence of a violating monitor does not automatically disqualify a county from a PM<sub>2.5</sub> nonattainment designation.

Connecticut recommended that the entire State be designated as attainment based on an argument that the violating monitor is a "hot spot" (letter from CT DEP to EPA, February 10, 2004). As an alternative, if EPA does not accept the "hot spot" analysis, CT recommended a nonattainment designation for a limited geographic area, such as the City of New Haven or New Haven County. In addition, CT recommended that all CT counties should be excluded from the nonattainment area associated with the New York-Northern New Jersey-Long Island, NY-NJ-CT-PA Consolidated Metropolitan Statistical Area (CMSA) based on an argument that Connecticut does not significantly contribute to PM<sub>2.5</sub> violations in the New York City metropolitan area.

Massachusetts DEP recommended that all of Massachusetts be designated as attainment/unclassifiable for PM<sub>2.5</sub> based on air quality data measured at the monitors within the State (letter from MA DEP to EPA, February 13, 2004). This designation is appropriate for areas where monitors have insufficient data, but where available data support attainment of standards.

Based on EPA's 9-factor analysis, EPA proposes that Fairfield and New Haven Counties in Connecticut be considered for a designation of nonattainment of the fine particle (PM<sub>2.5</sub>) air-quality standard as part of the New York City nonattainment area.

NY-NJ-CT-PA CMSA Area	State Recommended Nonattainment Counties	EPA Proposed Nonattainment Counties
Connecticut	None	New Haven County Fairfield County
Massachusetts	None	None

The following is a brief summary of the 9-factor analysis for the New England portion of the New York-Newark-Bridgeport, NY-NJ-CT-PA CSA.

### **Factor 1: Emissions**

For this factor, EPA looked at primary PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, carbon, and crustal PM<sub>2.5</sub> emissions. Weighted emissions score serves as an indicator of the local PM<sub>2.5</sub> contribution. The emissions score (also called "composite" or "cumulative" emissions score) was derived as follows:

$$\begin{aligned} \text{Emissions score} = & [(\text{county SO}_2 \text{ tons/ CSA SO}_2 \text{ tons}) * (\% \text{ sulfate of urban excess PM}_{2.5})] \\ & + [(\text{county NO}_x \text{ tons/ CSA NO}_x \text{ tons}) * (\% \text{ nitrate of urban excess PM}_{2.5})] \\ & + [(\text{county carbon tons/ CSA carbon tons}) * (\% \text{ carbon of urban excess PM}_{2.5})] \\ & + [(\text{county crustal PM tons/ CSA crustal PM tons}) * (\% \text{ crustal of urban excess PM}_{2.5})] \end{aligned}$$

For the NY-NJ-CT-PA CSA, "urban excess" was estimated using data from speciation monitors in Newark, NJ (urban site) and in Brigantine National Wildlife Refuge, NJ (regional site) for the period from April 2002 to March 2003. For the Newark speciation monitor, the total PM mass for this period was 17.5 ug/m<sup>3</sup>; for the Brigantine IMPROVE monitor, the total PM mass was 10.9 ug/m<sup>3</sup>. Therefore, the urban excess was estimated to be 6.6 ug/m, composed of 6% SO<sub>2</sub>, 25% NO<sub>x</sub>, 67% carbon, and 3% crustal material.

The table below shows total emissions (in tons) and emissions scores for counties that are included in the NY-NJ-CT-PA CSA and for those that are adjacent to the CSA. The counties that are in the 2003-defined CSA are in **bold**; other counties are adjacent to the CSA counties. (Data source: 2001 National Emissions Inventory (NEI).) Following this table is a histogram showing total 2001 emissions of NO<sub>x</sub> and carbon, the major "local" PM<sub>2.5</sub> components for the CSA counties and adjacent counties.

Emissions scores for all counties in the NY-NJ-CT-PA CSA add to 100 (see "Cumulative Emissions Score" on table). Counties adjacent to the CSA are assigned an emissions score based on the emissions scores of counties in the CSA so that emissions from those counties can be compared to the CSA counties.

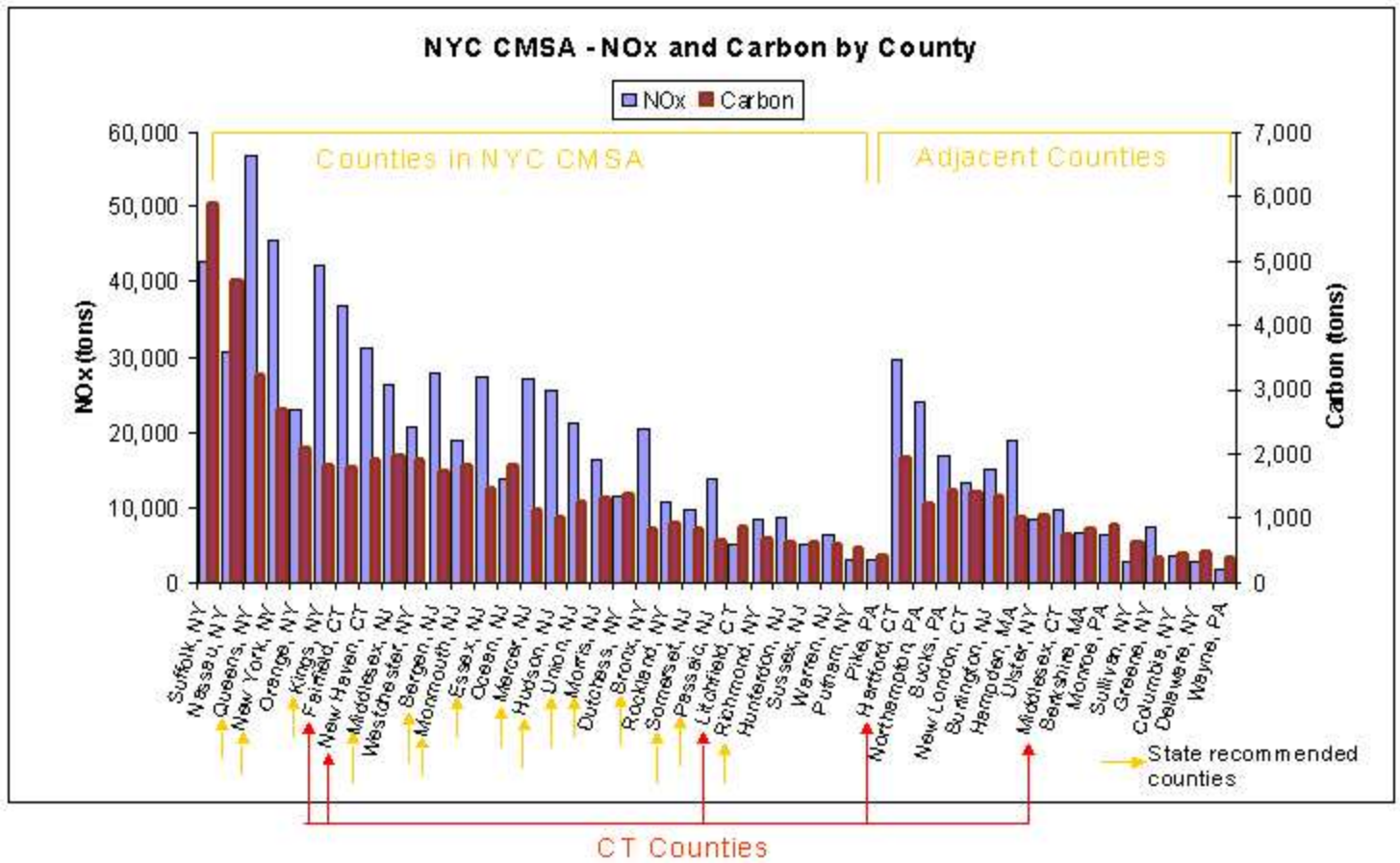
County	State Recommended Nonattainment	Design Values 2001-2003 ( $\mu\text{g}/\text{m}^3$ )	Direct $\text{PM}_{2.5}$ (tons)	$\text{SO}_x$ (tons)	$\text{NO}_x$ (tons)	Carbon $\text{PM}_{2.5}$ (tons)	Crustal $\text{PM}_{2.5}$ (tons)	Emissions Score	Cumulative Emissions Score
Suffolk, NY	No	12.3	9,834	45,379	42,938	5,894	3,455	10.8	10.8
Nassau, NY	No	12.4	7,289	12,587	30,695	4,665	2,370	7.9	18.7
Queens, NY	Yes	13.6	5,443	21,315	57,013	3,203	1,539	7.0	25.7
New York, NY	Yes	17.7	4,531	29,811	45,611	2,701	1,269	6.1	31.8
Orange, NY	No	11.6	4,410	30,875	22,978	2,091	2,058	4.5	36.3
Kings, NY	Yes	14.9	3,039	14,163	42,392	1,800	973	4.4	40.7
Fairfield, CT	No	13.3	3,154	20,031	36,762	1,779	1,008	4.3	45.0
New Haven, CT	No <sup>1</sup>	16.7	3,170	17,771	31,345	1,903	1,009	4.2	49.2
Middlesex, NJ	Yes	12.7	3,430	5,663	26,425	1,960	1,269	3.9	53.1
Westchester, NY	No	12.5	3,229	9,680	20,815	1,923	1,154	3.7	56.8
Bergen, NJ	Yes	13.8	2,691	7,945	27,835	1,451	1,726	3.6	60.4
Monmouth, NJ	Yes		3,143	3,028	18,971	1,820	1,226	3.4	63.8
Essex, NJ	Yes	14.5	2,435	8,114	27,325	1,466	808	3.2	67.0
Ocean, NJ	No	11.7	3,291	1,500	13,754	1,802	1,404	3.1	70.1
Mercer, NJ	Yes	14.0	2,950	16,426	27,098	1,113	1,608	3.0	73.1
Hudson, NJ	Yes	14.8	2,529	22,745	25,572	1,004	1,241	2.9	76.0
Union, NJ	Yes	15.7	2,092	5,393	21,149	1,263	688	2.7	78.7
Morris, NJ	Yes	12.6	2,038	3,753	16,208	1,301	648	2.5	81.2
Dutchess, NY	No	11.0	2,804	4,786	11,471	1,387	1,330	2.5	83.7
Bronx, NY	Yes	15.8	1,460	6,723	20,299	849	503	2.1	85.8
Rockland, NY	No		1,762	9,541	10,621	928	625	1.9	87.7
Somerset, NJ	Yes		1,523	2,490	9,743	816	610	1.6	89.3

<b>Passaic, NJ</b>	Yes	13.3	994	4,349	13,645	658	260	1.5	92.3
<b>Litchfield, CT</b>	No		1,574	934	5,062	852	670	1.4	93.7
<b>Richmond, NY</b>	Yes	12.2	1,776	1,079	8,399	708	1,009	1.4	95.1
<b>Hunterdon, NJ</b>	No		1,490	1,158	8,494	628	809	1.3	96.4
<b>Sussex, NJ</b>	No		1,225	872	5,191	612	574	1.1	97.5
<b>Warren, NJ</b>	No	13.5	1,204	975	6,358	600	530	1.1	98.6
<b>Putnam, NY</b>	No		1,040	548	3,083	505	512	0.9	99.5
<b>Pike, PA</b>	No		739	355	2,997	402	317	0.7	100.2
Hartford, CT	No	13.1	3,145	4,326	29,590	1,947	1,058	3.9	
Northampton, PA	No	14.8	5,646	55,105	24,051	1,212	3,374	3.9	
Bucks, PA	Yes <sup>2</sup>	14.6	3,100	6,870	16,852	1,443	1,444	2.8	
Burlington, NJ	No		2,298	2,330	15,113	1,326	836	2.5	
Hampden, MA	No	13.5	1,965	16,077	19,050	994	781	2.4	
Ulster, NY	No		2,328	3,818	8,417	1,025	1,235	1.9	
Middlesex, CT	No		1,417	4,751	9,520	731	563	1.5	
Berkshire, MA	No	12.2	1,641	3,702	6,382	826	711	1.5	
Monroe, PA	No		1,758	1,367	6,222	881	811	1.5	
Sullivan, NY	No		1,200	612	2,875	625	544	1.0	
Greene, NY	No		936	3,836	7,511	375	503	0.9	
Columbia, NY	No		1,018	585	3,497	420	574	0.8	
Delaware, NY	No		996	879	2,705	496	475	0.8	
Wayne, PA	No		765	746	1,786	374	365	0.6	

1. Only recommended NA under scenario that EPA disagrees with “hotspot” argument.

2. Recommended to be part of Philadelphia nonattainment area.





EPA developed a national process for assessing emissions based on emissions scores to identify candidate counties for a  $PM_{2.5}$  nonattainment designation. This process flags CSA and adjacent counties with relatively high cumulative emissions scores. For the NY-NJ-CT-PA CSA, counties with cum emissions scores of  $\leq 80\%$  (as well as adjacent counties that have emissions scores that are  $\geq$  the emissions score of the 80% CSA county) were considered to be counties with relatively high emissions. The 80% CSA cutoff counties are Morris, NJ and Dutchess, NY (cum emissions scores = 81.2 and 83.7, respectively; emissions scores = 2.5).

This process applied to the New England counties identifies Fairfield, New Haven, and Hartford Counties in Connecticut as candidates for a  $PM_{2.5}$  nonattainment designation (i.e., counties with emissions scores  $\geq 2.5$ ), and, therefore, requiring further analysis.

Litchfield and Middlesex Counties in Connecticut, and Hampden and Berkshire Counties in Massachusetts are dropped from further analysis because (1) none of these counties contain violating  $PM_{2.5}$  monitors, (2) none were recommended for a nonattainment designation by the State, and (3) all have emissions scores  $\leq 2.5$ .

## Factor 2: Air quality

PM<sub>2.5</sub> Design Values (in µg/m<sup>3</sup>) for the three-year period from 2001 to 2003 are given in the table above for all counties in and adjacent to the NY-NJ-CT-PA CSA. In New England, only one county, New Haven, shows a violation of the annual PM<sub>2.5</sub> standard. However, this factor alone is not sufficient to eliminate the other New England counties as candidates for nonattainment status.

## Factors 3 (Population Density and Urbanization) and 4 (Traffic and commuting patterns)

The table below shows population, VMT and commuting data for counties that are included in the NY-NJ-CT-PA CSA and for those that are adjacent to the CSA. The ranking of the counties is based on the number of people commuting to other counties from highest to lowest. The counties that are in the 2003-defined CSA are in **bold**; other counties are adjacent to the CSA counties.

County	State Recommended NA	2002 Population	2002 Pop Density (pop/sq mi)	2002 VMT (1000 mi)	Commuting to Other Metro Counties (%)	Commuting to Other Metro Counties (#)
<b>Queens, NY</b>	Yes	2,237,815	20,530	10,441	60	557,383
<b>Kings, NY</b>	Yes	2,488,194	35,045	12,313	51	463,551
<b>Nassau, NY</b>	No	1,344,892	4,686	6,875	41	256,588
<b>Bronx, NY</b>	Yes	1,354,068	32,240	6,440	59	243,970
<b>Bergen, NJ</b>	Yes	895,091	3,825	6,732	42	178,468
<b>Suffolk, NY</b>	No	1,458,655	1,601	7,414	26	175,244
<b>Middlesex, NJ</b>	Yes	775,549	2,494	5,794	43	157,177
<b>Westchester, NY</b>	No	937,279	2,165	4,964	36	154,322
<b>Essex, NJ</b>	Yes	798,301	6,336	6,356	46	150,496
<b>Hudson, NJ</b>	Yes	611,439	13,009	4,518	53	141,386
<b>Union, NJ</b>	Yes	530,763	5,153	4,034	52	123,905
<b>Passaic, NJ</b>	Yes	496,646	2,685	3,568	54	113,164
<b>Monmouth, NJ</b>	Yes	629,836	1,334	5,146	39	112,634
<b>New York NY</b>	Yes	1,546,856	55,245	7,961	15	111,765
<b>Richmond, NY</b>	Yes	457,383	7,752	2,030	54	104,042
<b>Morris, NJ</b>	Yes	478,730	1,021	3,939	41	98,930
<b>Somerset, NJ</b>	Yes	309,886	1,016	2,209	55	82,696
<b>Fairfield, CT</b>	No	896,202	1,432	7,889	19	78,180
<b>Ocean, NJ</b>	No	537,065	844	3,641	37	76,620

<b>New Haven, CT</b>	No <sup>1</sup>	835,657	1,379	6,989	19	72,261
<b>Rockland, NJ</b>	No	291,835	1,677	1,413	45	59,116
<b>Orange, NY</b>	No	356,773	437	3,628	32	48,241
<b>Sussex, NJ</b>	No	148,680	285	1,323	58	42,375
<b>Mercer, NJ</b>	Yes	359,463	1,591	3,869	24	38,571
Hartford, CT	No	867,332	1,178	8,105	9	35,469
Bucks, PA	Yes <sup>2</sup>	610,440	1,004	3,830	11	34,474
<b>Putnam, NY</b>	No	98,257	424	781	71	34,078
<b>Dutchess, NJ</b>	No	287,752	359	2,905	27	34,054
<b>Hunterdon, NJ</b>	No	125,795	293	1,893	54	33,861
Burlington, NJ	No	437,871	544	3,748	14	29,263
<b>Litchfield, CT</b>	No	186,515	203	1,170	30	27,825
<b>Warren, NJ</b>	No	107,537	300	1,473	52	26,228
Ulster, NY	No	179,986	160	1,850	30	24,275
Northampton, PA	No	273,324	731	2,132	15	18,557
Middlesex, CT	No	159,679	433	1,560	18	14,700
Monroe, PA	No	148,839	245	1,434	22	13,830
<b>Pike, PA</b>	No	50,095	92	722	46	8,820
Sullivan, NY	No	74,273	77	683	27	7,999
Columbia, NY	No	63,532	100	754	12	3,532
Greene, NY	No	48,538	75	643	7	1,487
Berkshire, MA	No	133,462	143	1,850	2	1,291
Wayne, PA	No	48,889	67	334	6	1,269
Hampden, MA	No	459,116	742	3,708	1	1,016
Delaware, NY	No	47,302	33	508	4	846
1. Only recommended NA under scenario that EPA disagrees with “hotspot” argument. 2. Recommended to be part of Philadelphia nonattainment area.						

The three candidate counties in CT (i.e., Fairfield, New Haven, and Hartford Counties) have moderately sized populations and population densities relative to other counties in the NY-NJ-CT-PA CSA and adjacent counties.

Although there is a much smaller number of commuters in the three Connecticut counties than in some NY counties in the NY-NJ-CT-PA CSA, the number of commuters in Fairfield and New Haven Counties is moderately high, each with more than twice as many commuters as Hartford County.

CT DEP used 2000 Census Bureau data on work-trip origins and destinations to assess Connecticut contribution (i.e., from Fairfield, New Haven, and Litchfield counties) to traffic levels in the New York portion of the CMSA. CT DEP concluded that the Connecticut contribution is 0.7% overall, with 0.1% in the NJ portion and 1.0% in the New York portion of the CMSA. However, heavy-duty truck traffic from Connecticut to both New York and New Jersey may not have been adequately taken into account in this analysis.

All three counties score relatively high for VMT when compared to the rest of the CSA and adjacent counties.

**Factor 5: Expected growth**

The table below shows population, population growth, VMT and VMT growth for counties that are included in the NY-NJ-CT-PA CSA. The ranking of the counties is based on the VMT growth in thousand of miles between 1996 and 2002 from highest to lowest.

<b>County</b>	<b>Population (2002)</b>	<b>Population Growth (90-00)</b>	<b>% growth (90-00)</b>	<b>VMT in thousand miles (2002)</b>	<b>VMT Growth in thousand miles (96-02)</b>	<b>VMT % chng (96-02)</b>
Kings, NY	2,488,194	164,662	7	12,313	1,011	39
Westchester, NY	937,279	48,593	6	4,964	755	13
Monmouth, NJ	629,836	62,177	11	5,146	739	17
Middlesex, NJ	775,549	78,382	12	5,794	721	14
New Haven, CT	835,657	19,789	2	6,989	714	11
Essex, NJ	798,301	15,427	2	6,356	713	13
Fairfield, CT	896,202	54,922	7	7,889	656	9
Suffolk, NY	1,458,655	97,505	7	7,414	595	9
Warren, NJ	107,537	10,830	12	1,473	578	65
Bergen, NJ	895,091	58,738	7	6,732	540	12
Mercer, NJ	359,463	24,937	8	3,869	526	16
Hudson, NJ	611,439	55,876	10	4,518	506	13
Hunterdon, NJ	125,795	14,213	13	1,893	481	34
Passaic, NJ	496,646	35,989	8	3,568	466	15
Ocean, NJ	537,065	77,713	18	3,641	464	15
Union, NJ	530,763	28,722	6	4,034	452	13
Dutchess, NY	287,752	20,688	8	2,905	408	12

Pike, PA	50,095	18,336	66	722	406	128
Somerset, NJ	309,886	57,211	24	2,209	336	18
Litchfield, CT	186,515	8,101	5	1,170	232	25
Orange, NY	356,773	33,720	11	3,628	213	2
Queens, NY	2,237,815	277,781	14	10,441	180	2
New York, NY	1,546,856	49,659	3	7,961	137	2
Putnam, NY	98,257	11,804	14	781	134	21
Nassau, NY	1,344,892	47,196	4	6,875	117	2
Bronx, NY	1,354,068	128,861	11	6,440	111	2
Morris, NJ	478,730	48,859	12	3,939	97	3
Sussex, NJ	148,680	13,223	10	1,323	74	6
Richmond, NY	457,383	64,751	17	2,030	35	2
Rockland, NY	291,835	21,278	8	1,413	24	2

Based on analysis of this factor, Fairfield and New Haven counties had low population growth between 1990 and 2000. However, they both had a sizable increase in vehicle miles traveled from 1996-2002, an increase above most other counties in the NY-NJ-CT-PA CSA.

**Factor 6: Meteorology**

County	Prevailing Wind Direction %			
	NW	SW	SE	NE
<b>Fairfield, CT</b>	<b>34</b>	<b>30</b>	<b>12</b>	<b>24</b>
<b>New Haven, CT</b>	<b>34</b>	<b>30</b>	<b>13</b>	<b>24</b>
<b>Hartford, CT</b>	<b>35</b>	<b>29</b>	<b>13</b>	<b>23</b>

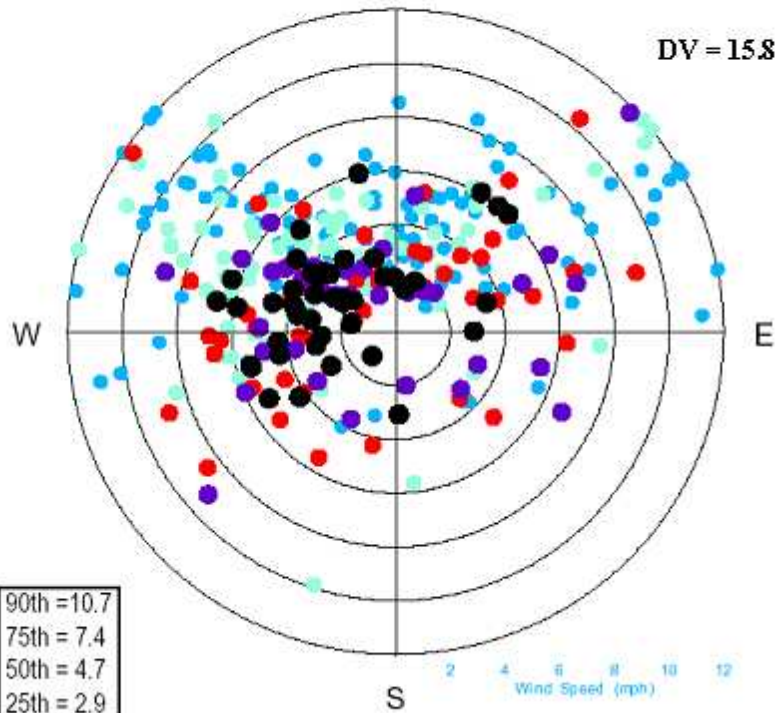
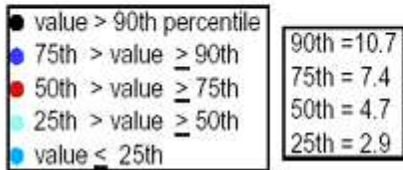
# "Bubble Rose" of Wind and PM2.5 data for New York Urban Area

Area= New York, NY-NJ-CT-PA; Site= 360050080

Individual 24-hour FRM data (2001-2003) paired with daily resultant WS/WD (includes event-flagged data)

**PM Station:**  
Bronx, New York

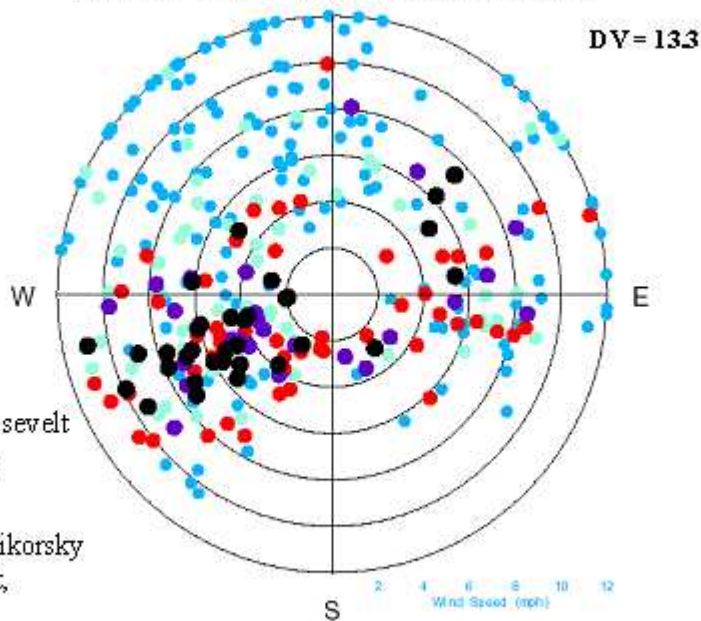
**MET Station:**  
Central Park, NY



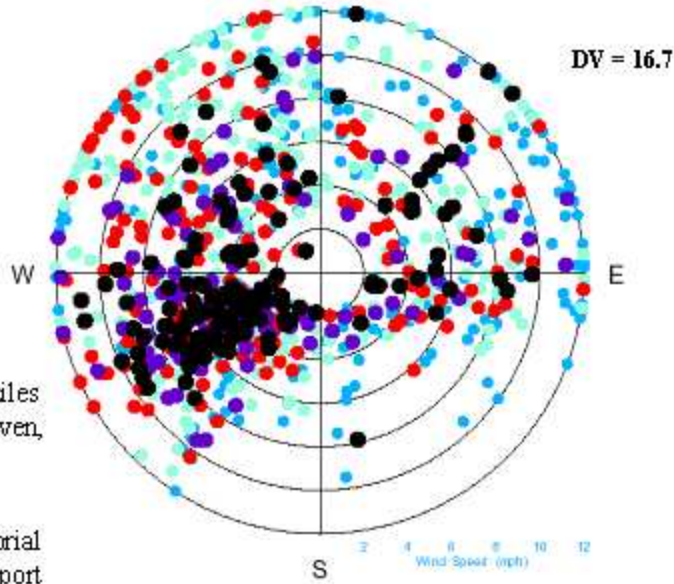
Area= New York, NY-NJ-CT-PA; Site= 090010010

**PM Station:** Roosevelt School Park Ave, Bridgeport, CT

**MET Station:** Sikorsky Memorial Airport, Bridgeport



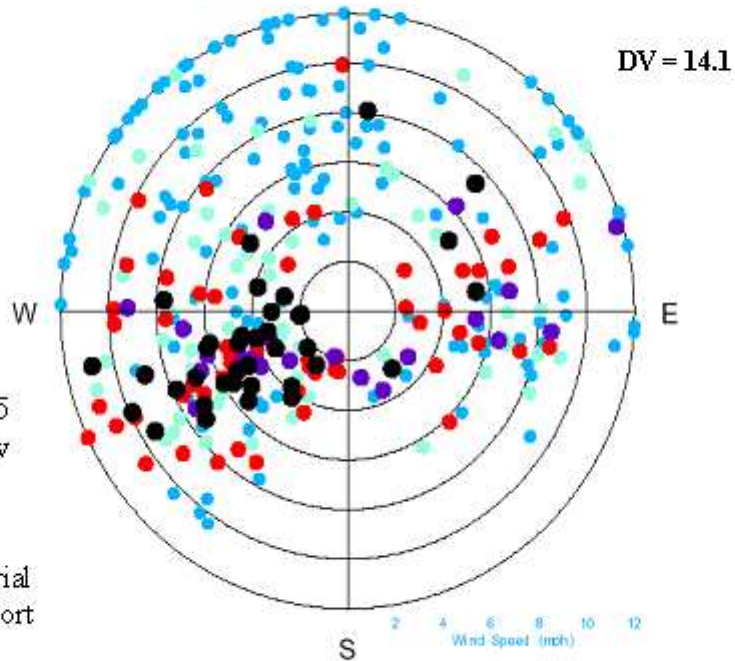
Area= New York, NY-NJ-CT-PA; Site= 090090018



**PM Station:** Stiles Street, New Haven, CT

**MET Station:** Sikorsky Memorial Airport, Bridgeport

Area= New York, NY-NJ-CT-PA; Site= 090091123



**PM Station:** 715 State Street, New Haven, CT

**MET Station:** Sikorsky Memorial Airport, Bridgeport



Connecticut did studies to assess whether emissions from Connecticut sources are contributing significantly to violations in other parts of the New York City metropolitan area. These studies included use of the ISCST3 (Industrial Source Complex Simple Terrain) area source model and HYSPLIT4 (HYbrid Single-Particle Lagrangian Integrated Trajectory) model.

Results from ISCST3 model show that primary PM<sub>2.5</sub> emissions have low impact on New York City and Hudson Co, NJ. The model estimates the Connecticut source contribution to New York City to be between 1.7 and 2.3%. For receptors in the cities of Bridgeport and New Haven, Connecticut sources contributed > 50% primary PM<sub>2.5</sub> totals.

For the HYSPLIT4 model, Connecticut obtained maximum daily PM<sub>2.5</sub> concentrations from January 1999 to September 2003 from a monitor in New York City, rank-ordered them from high to low, and recorded dates of the top and bottom 10 percentile. They then ran back-trajectory winds once a day for each of those days at three height levels (10m, 500m, and 1000m). Results of this modeling show that air mass during highest PM<sub>2.5</sub> days originated from and passed through locations in a sector from SSW and SW through W and WNW from New York City, and not from directions that pass over Connecticut.

Although the meteorological data make a strong case that CT is not frequently a significant contributor to elevated PM<sub>2.5</sub> levels in the New York City urban area, EPA notes that PM<sub>2.5</sub> is a year-round standard with some contributions during all seasons from many directions, as shown in the “bubble roses” above for monitors in the Bronx, Fairfield and New Haven counties. These roses show that, although not a frequent occurrence, some component of elevated PM<sub>2.5</sub> measured at the monitor in the Bronx does originate from a northeastern direction (i.e., direction of CT). The roses also show the need to consider the contribution of NJ and NY to the violating monitor in Connecticut. This is also supported by modeling done for the Clean Air Interstate Rule (see EPA's January 30, 2004 (69 FR 4566) notice of proposed rulemaking (NPR)), which showed that both NJ and NY “contribute significantly” to New Haven County.

Based on analysis of this factor, EPA is not convinced that Fairfield and New Haven counties should be excluded from the New York City nonattainment area. However, Hartford County, which is an adjacent county to the NY-NJ-CT-PA CSA, is further removed geographically and meteorologically from the NYC area. Based on this fact, plus the absence of a violating PM<sub>2.5</sub> monitor in Hartford County, EPA concludes that Hartford County can be dropped from further consideration as a nonattainment county.

### **Factor 7: Geography/topography**

The New England portion of the NY-NJ-CT-PA CSA and adjacent counties do not have any geographical or topographical boundaries limiting its airshed.

This factor did not play a significant role in the decision making process.

### **Factor 8: Jurisdictional boundaries**

From a New England perspective, the major jurisdictional boundary in the NY-NJ-CT-PA CSA (and adjacent counties) is the State line between New York and Connecticut. Violating counties in the NY-NJ-CT-PA CSA include New York County (Manhattan), Bronx County, and Union County, NJ. The State of Connecticut has no jurisdictional say in the air quality regulations and policies developed by either New York or New Jersey to address PM<sub>2.5</sub> emissions in the areas with the violating monitors. In addition, State of Connecticut has very limited influence in the transportation policies developed to address traffic and vehicle miles traveled in the New York City metropolitan area.



On the other hand, areas designated as 8-hour ozone nonattainment areas are also important boundaries for State air-quality planning. Fairfield, New Haven, and Middlesex counties in Connecticut were included in the ozone nonattainment area associated with the New York City metropolitan area. Other counties included in this 9-factor analysis are also designated as 8-hour ozone nonattainment areas, but are not associated with the New York City area. A goal in designating PM<sub>2.5</sub> nonattainment areas is to achieve a degree of consistency with ozone nonattainment areas. Comparison of ozone areas with potential PM<sub>2.5</sub> nonattainment areas, therefore, gives added weight to designation of Fairfield and New Haven counties, but not to the other CSA and adjacent counties considered herein.

**Factor 9: Level of control of emission sources**

The emissions used to prepare the composite emissions scores are for 2001. These emission estimates include any control strategies implemented by the States in the CSA prior to 2001 that may influence emissions of primary PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, carbon, and crustal PM<sub>2.5</sub> emissions.

In CT, however, there may be some emission reductions of SO<sub>2</sub> subsequent to 2001 that are not accounted for pursuant to the SO<sub>2</sub> rule Connecticut adopted pursuant to State legislation (see <http://dep.state.ct.us/air2/regs/mainregs/sec19a.pdf>). This rule basically requires compliance with 0.55 lbs/mm BTU by January 1, 2002 and 0.33 lbs/mm BTU by January 1, 2003. To date, this rule has resulted in a significant reduction in Statewide SO<sub>2</sub> emissions. However, in the New York City metropolitan area, only a small percentage of the urban increment is from SO<sub>2</sub> (i.e., about 6%). Thus, incorporating the additional SO<sub>2</sub> emission reductions from Connecticut sources in the composite emissions score analysis for the CSA is not expected to change the outcome significantly. Furthermore, the Connecticut SO<sub>2</sub> rule is currently not part of the federally-approved State Implementation Plan, and thus is not federally enforceable. Thus, this factor analysis generally considered the emissions controls currently in place.