



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

**REGION 2  
290 BROADWAY  
NEW YORK, NY 10007-1866**

**AUG 14 2008**

Pete Grannis  
Commissioner  
State of New York Department of Environmental Conservation  
Albany, New York 12233-1010

Dear Commissioner Grannis:

Thank you for your recommendations on the status of fine particle pollution throughout New York. Fine-particle pollution represents one of the most significant barriers to clean air facing our nation today. Health studies link these tiny particles – about 1/30<sup>th</sup> the diameter of a human hair – to serious human health problems including aggravated asthma, increased respiratory symptoms like coughing and difficult or painful breathing, chronic bronchitis, decreased lung function, and even premature death in people with heart and lung disease. Fine particle pollution can remain suspended in the air for long periods of time and create public health problems far away from emission sources. Reducing levels of fine-particle (PM<sub>2.5</sub>) pollution is an important part of our nation's commitment to clean, healthy air.

We have reviewed the December 18, 2007 letter submitting New York's recommendations on air quality designations for the most recent 24-hour PM<sub>2.5</sub> standard, and the June 9, 2008 response letter sent to EPA after the Agency indicated that New York could modify its recommendations based on the most recent air quality data. The revised standard is referred to as the "2006" 24-hour PM<sub>2.5</sub> air quality standard. We have also reviewed the technical information submitted to support New York's recommendations. We appreciate the effort New York has made to develop this supporting information. Consistent with the Clean Air Act, this letter is to inform you that the Environmental Protection Agency (EPA) intends to support New York's recommended designations and boundaries for the 2006 24-hour PM<sub>2.5</sub> standard for the New York Metropolitan area. For the Buffalo/Niagara Falls Area, EPA intends to modify New York's recommendation of unclassifiable. EPA is proposing to designate the Buffalo/Niagara Falls Area as attainment/unclassifiable since air quality measurements indicate the area has been attaining the 24-hour PM<sub>2.5</sub> standard since 2006.

We have enclosed a detailed analysis of relevant areas that serves as the basis for EPA's preliminary concurrence with New York's recommendations for the New York Metropolitan area, and the basis for our modification for the Buffalo/ Niagara Falls area. Should you have additional information that you wish to be considered by EPA in this process, please provide it to us by October 20, 2008.

EPA has taken steps to reduce fine particle pollution across the country, such as the Clean Diesel Program to dramatically reduce emissions from highway, nonroad and stationary diesel engines. In addition, state programs to attain the previous PM<sub>2.5</sub> standards will also help to reduce unhealthy levels of fine particle pollution.

Internet Address (URL) • <http://www.epa.gov>

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 50% Postconsumer content)

We intend to make final designation decisions for the 2006 24-hour PM<sub>2.5</sub> standard by December 18, 2008. If you have any questions, please do not hesitate to contact me. 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 that reads "Alan J. Steinberg". The signature is written in a cursive style with a large, stylized initial "A".

Alan J. Steinberg  
Regional Administrator

Enclosure

cc: Dave Shaw, NYSDEC  
Robert Sliwinski, NYSDEC

## Attachment 1

### **New York Area Designations For the 24-Hour Fine Particle National Ambient Air Quality Standard**

The table below identifies the counties in New York that EPA intends to designate as not attaining the 2006 24-hour fine particle (PM<sub>2.5</sub>) standard.<sup>1</sup> A county will be designated as nonattainment if it has an air quality monitor that is violating the standard or if the county is determined to be contributing to the violation of the standard.

Area	New York Recommended Nonattainment Counties	New York Recommended Unclassifiable Counties	EPA's Intended Nonattainment Counties
New York-Northern New Jersey-Long Island, NY-NJ-CT area	Bronx, Kings, Nassau, New York, Orange, Queens, Richmond, Rockland, Suffolk and Westchester	None	No change
Buffalo-Niagara Falls area	None	Erie and Niagara	None

EPA intends to designate Erie and Niagara counties, as well as the remaining counties in the state as “attainment/unclassifiable.”

#### **EPA Technical Analysis for New York-Northern New Jersey-Long Island, NY-NJ-CT area**

##### Discussion

Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those areas that contribute to violations. This technical analysis for New York-Northern New Jersey-Long Island, NY-NJ-CT area (New York City Metropolitan area) identifies the counties with monitors that violate the

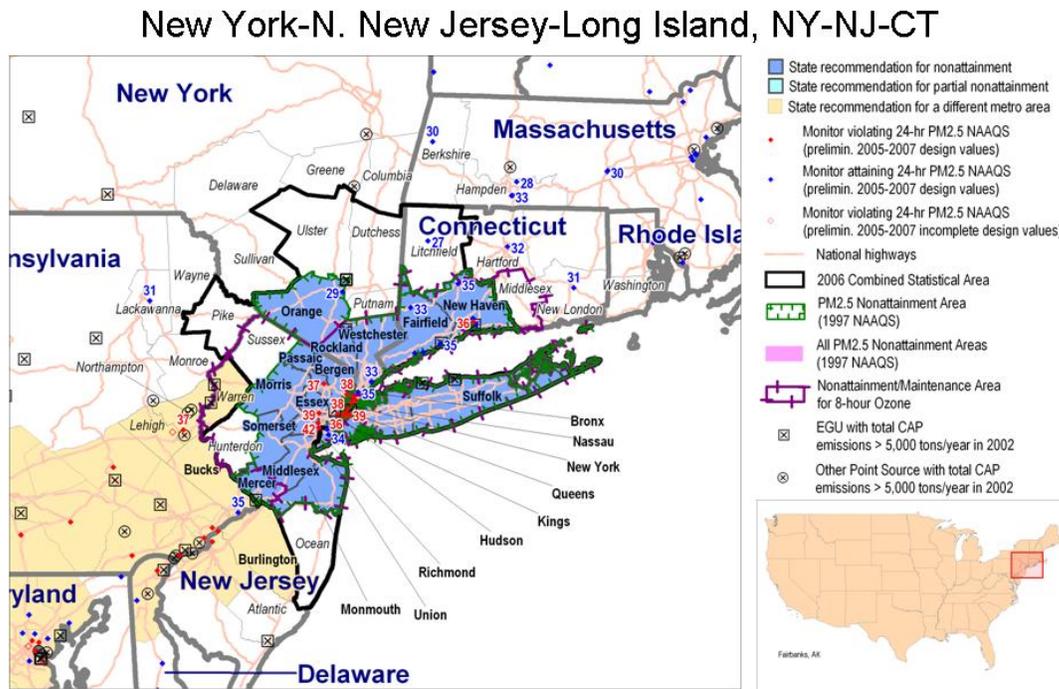
---

<sup>1</sup> EPA designated nonattainment areas for the 1997 fine particle standards in 2005. In 2006, the 24-hour PM<sub>2.5</sub> standard was revised from 65 micrograms per cubic meter (average of 98<sup>th</sup> percentile values for 3 consecutive years) to 35 micrograms per cubic meter; the level of the annual standard for PM<sub>2.5</sub> remained unchanged at 15 micrograms per cubic meter (average of annual averages for 3 consecutive years).

24-hour PM<sub>2.5</sub> standard and evaluates the counties that potentially contribute to fine particle concentrations in the area. EPA has evaluated these counties based on the weight of evidence of the following nine factors recommended in EPA guidance and any other relevant information:

- pollutant emissions
- air quality data
- population density and degree of urbanization
- traffic and commuting patterns
- growth
- meteorology
- geography and topography
- jurisdictional boundaries
- level of control of emissions sources

Figure 1 is a map of the counties in the area and other relevant information such as the locations and design values of air quality monitors, the metropolitan area boundary, and counties recommended as nonattainment by the State.

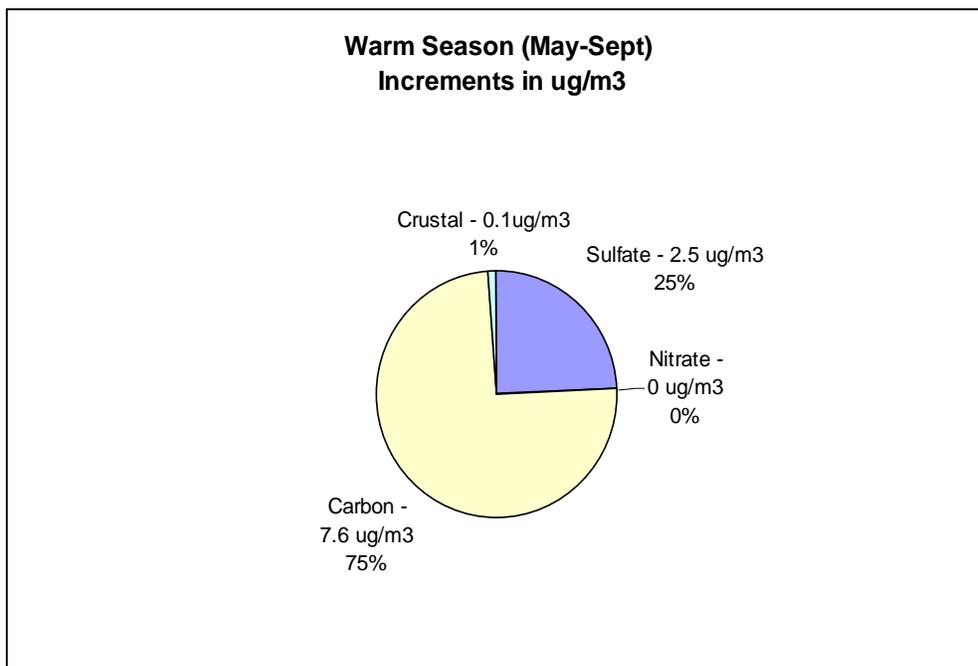


**Figure 1. New York-Northern New Jersey-Long Island, NY-NJ-CT area**

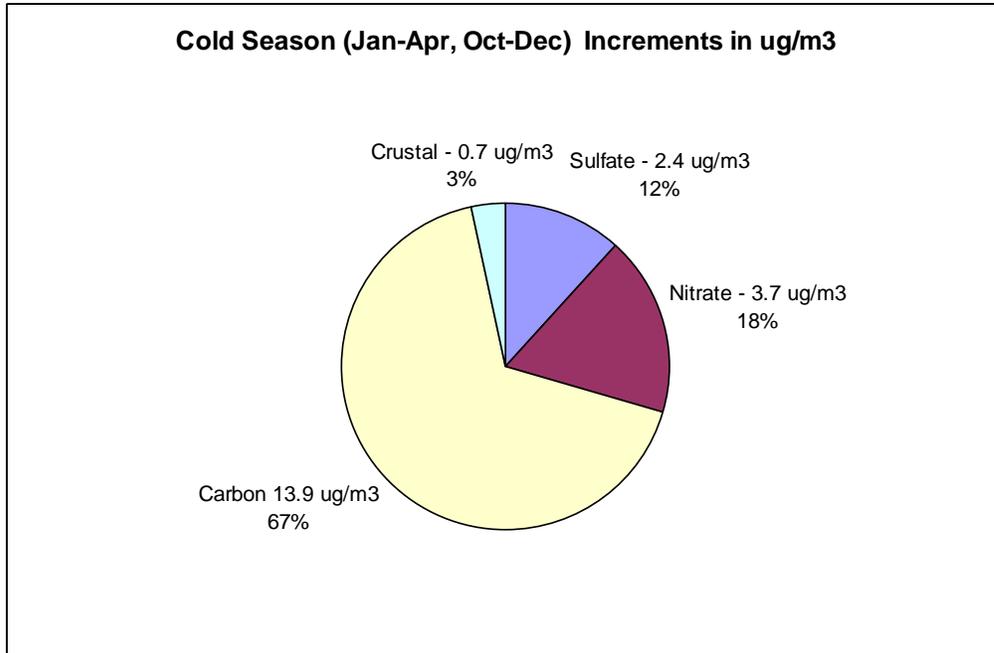
For this area, EPA previously established PM<sub>2.5</sub> nonattainment boundaries for the 1997 PM<sub>2.5</sub> NAAQS that included ten full counties located in New York.

In a letter received on December 18, 2007, New York recommended that Bronx, Kings, Nassau, New York, Orange, Queens, Richmond, Rockland, Suffolk and Westchester counties be designated as nonattainment for the 2006 24-hour PM<sub>2.5</sub> standard based on air quality data from 2004-2006. These data are from Federal Reference Method (FRM) and Federal Equivalent Method (FEM) monitors located in the state.

Air quality monitoring data on the composition of fine particle mass are available from the EPA Chemical Speciation Network and the IMPROVE monitoring network. Analysis of these data indicates that the days with the highest fine particle concentrations occur predominantly in the warm season. The PM<sub>2.5</sub> urban increment as noted in the below figures is dominated by total carbon in both the warm and cold season months (i.e. 75 percent in the warm season, and 67 percent in the cold season). Sulfates are 25 percent in the warm, and 12 percent in the cold seasons. Nitrate was measured at 18 percent in the cold season and was insignificant in the warm season (~0%). Warm season nitrate and crustal components represent very small portions of the urban increment as noted in the above figures.



**Figure 2. PM<sub>2.5</sub> Compositional Analysis of Warm Season Urban Increment for the New York City Metropolitan area. Total Urban Increment = 10.2 ug/m<sup>3</sup>**



**Figure 3. PM<sub>2.5</sub> Compositional Analysis of Cold Season Urban Increment for the New York City Metropolitan area. Total Urban Increment = 20.7 ug/m<sup>3</sup>**

In their December 2007 letter, New York also submitted PM<sub>2.5</sub> speciation data, from urban and rural monitoring site in the New York City vicinity. The speciation data was dominated mostly by organic carbon and sulfates - over 50 percent of total mass for both urban and rural monitoring sites. Elemental carbon, organic carbon, sulfates, and nitrates were higher at the urban location, indicating some local source contribution.

Based on EPA's 9-factor analysis described below, EPA believes that 10 counties in New York State, the same counties as previously designated for PM<sub>2.5</sub>, should be designated nonattainment for the 24-hour PM<sub>2.5</sub> air-quality standard as part of the New York City Metropolitan nonattainment area, based upon currently available information. These counties are listed in the table below.

New York City Metropolitan area	State-Recommended Nonattainment Counties	EPA-Recommended Nonattainment Counties
New York-Northern New Jersey-Long Island, NY-NJ-CT area	Bronx, Kings, Nassau, New York, Orange, Queens, Richmond, Rockland, Suffolk and Westchester	No change

The following is a summary of the technical analysis, including a 9-factor analysis for the EPA Region 2 portion of the New York City Metropolitan area.

EPA is proposing attainment/ unclassifiable for Ulster, Dutchess, Sullivan, and Putnam counties in New York; and Warren, Hunterdon, Sussex, and Ocean counties in New Jersey. Sullivan, Putnam, Hunterdon, and Sussex counties had low emissions, low

Contributing Emission Scores (CES), low population, low commuting numbers, low growth, and low meteorological and geographical impact which indicates minimal contribution to violating monitors in the New York City Metropolitan area. Ulster and Dutchess counties were low for all of the above factors, with the exception of moderate emissions. Warren and Ocean were low for all of the above factors, with the exception of higher growth rates, and higher population for Ocean County.

All of the counties which EPA is proposing as attainment/unclassifiable do not have any violating ambient air quality monitors.

EPA is proposing nonattainment for the counties of New York, Bronx, Queens, Kings, Richmond, Nassau, Suffolk, Westchester, Orange, and Rockland Counties in New York; and Union, Bergen, Essex, Hudson, Mercer, Middlesex, Monmouth, Morris, Passaic, and Somerset in New Jersey in the New York City metropolitan nonattainment area.

### **Factor 1: Emissions data**

For this factor, EPA evaluated county level emission data for the following PM<sub>2.5</sub> components and precursor pollutants: “PM<sub>2.5</sub> emissions total,” “PM<sub>2.5</sub> emissions carbon,” “PM<sub>2.5</sub> emissions other,” “SO<sub>2</sub>,” and “NO<sub>x</sub>” “PM<sub>2.5</sub> emissions total” represents direct emissions of PM<sub>2.5</sub> and includes: “PM<sub>2.5</sub> emissions carbon,” “PM<sub>2.5</sub> emissions other”, primary sulfate (SO<sub>4</sub>), and primary nitrate. (Although primary sulfate and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO<sub>2</sub> and NO<sub>x</sub>, are part of “PM<sub>2.5</sub> emissions total,” they are not shown in Table 1 as separate items.). “PM<sub>2.5</sub> emissions carbon” represents the sum of organic carbon (OC) and elemental carbon (EC) emissions, and “PM<sub>2.5</sub> emissions other” represents other inorganic particles (crustal). Emissions of SO<sub>2</sub> and NO<sub>x</sub>, which are precursors of the secondary PM<sub>2.5</sub> components sulfate and nitrate, are also considered.

Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See [http://www.epa.gov/ttn/naaqs/pm/pm25\\_2006\\_techinfo.html](http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html).

EPA also considered the Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Note that this metric is not the exclusive way for consideration of data for these factors. A summary of the CES is included in Attachment 2, and a more detailed description can be found at [http://www.epa.gov/ttn/naaqs/pm/pm25\\_2006\\_techinfo.html#C](http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C).

Table 1 shows emissions of PM<sub>2.5</sub> and precursor pollutants components (given in tons per year) and the CES for violating and potentially contributing counties in the New York City Metropolitan area. Counties that are part of the New York City Metropolitan nonattainment area for the 1997 PM<sub>2.5</sub> NAAQS are shown in boldface. Counties are listed in descending order by CES.

County	State Recommended Nonattainment?	CES	PM <sub>2.5</sub> emissions total (tpy)	PM <sub>2.5</sub> emissions carbon (tpy)	PM <sub>2.5</sub> emissions other (tpy)	SO <sub>2</sub> (tpy)	NO <sub>x</sub> (tpy)
<b>Kings, NY</b>	<b>Yes</b>	<b>100</b>	<b>2,230</b>	<b>1,053</b>	<b>1,176</b>	<b>8,274</b>	<b>27,886</b>
<b>New York, NY</b>	<b>Yes</b>	<b>100</b>	<b>3,522</b>	<b>1,864</b>	<b>1,658</b>	<b>13,060</b>	<b>36,742</b>
<b>Hudson, NJ</b>	<b>Yes</b>	<b>100</b>	<b>2,933</b>	<b>671</b>	<b>2,261</b>	<b>27,305</b>	<b>26,889</b>
<b>Suffolk, NY</b>	<b>Yes</b>	<b>100</b>	<b>4,408</b>	<b>1,836</b>	<b>2,572</b>	<b>47,134</b>	<b>54,932</b>
<b>Fairfield, CT</b>	<b>Yes</b>	<b>100</b>	<b>3,056</b>	<b>1,630</b>	<b>1,426</b>	<b>9,533</b>	<b>26,382</b>
<b>Union, NJ</b>	<b>Yes</b>	<b>100</b>	<b>1,092</b>	<b>603</b>	<b>488</b>	<b>3,806</b>	<b>20,040</b>
<b>New Haven, CT</b>	<b>Yes</b>	<b>97</b>	<b>2,871</b>	<b>1,642</b>	<b>1,230</b>	<b>8,250</b>	<b>21,693</b>
<b>Queens, NY</b>	<b>Yes</b>	<b>78</b>	<b>2,976</b>	<b>1,430</b>	<b>1,545</b>	<b>18,460</b>	<b>40,922</b>
<b>Essex, NJ</b>	<b>Yes</b>	<b>77</b>	<b>942</b>	<b>637</b>	<b>304</b>	<b>4,647</b>	<b>22,221</b>
<b>Bronx, NY</b>	<b>Yes</b>	<b>58</b>	<b>1,106</b>	<b>535</b>	<b>571</b>	<b>3,703</b>	<b>14,362</b>
<b>Richmond, NY</b>	<b>Yes</b>	<b>Not Available</b>	<b>790</b>	<b>307</b>	<b>483</b>	<b>2,623</b>	<b>9,466</b>
<b>Bergen, NJ</b>	<b>Yes</b>	<b>48</b>	<b>1,219</b>	<b>886</b>	<b>333</b>	<b>1,691</b>	<b>23,827</b>
<b>Westchester, NY</b>	<b>Yes</b>	<b>43</b>	<b>1,751</b>	<b>947</b>	<b>805</b>	<b>4,770</b>	<b>24,755</b>
<b>Middlesex, NJ</b>	<b>Yes</b>	<b>42</b>	<b>1,549</b>	<b>951</b>	<b>598</b>	<b>3,129</b>	<b>29,172</b>
<b>Nassau, NY</b>	<b>Yes</b>	<b>41</b>	<b>2,149</b>	<b>1,091</b>	<b>1,058</b>	<b>6,203</b>	<b>31,877</b>
<b>Morris, NJ</b>	<b>Yes</b>	<b>24</b>	<b>1,498</b>	<b>953</b>	<b>545</b>	<b>1,177</b>	<b>13,774</b>
<b>Monmouth, NJ</b>	<b>Yes</b>	<b>21</b>	<b>1,506</b>	<b>989</b>	<b>517</b>	<b>1,789</b>	<b>16,771</b>
<b>Rockland, NY</b>	<b>Yes</b>	<b>20</b>	<b>1,296</b>	<b>327</b>	<b>968</b>	<b>12,711</b>	<b>12,777</b>
<b>Orange, NY</b>	<b>Yes</b>	<b>19</b>	<b>2,637</b>	<b>934</b>	<b>1,704</b>	<b>32,973</b>	<b>18,631</b>
<b>Mercer, NJ</b>	<b>Yes</b>	<b>16</b>	<b>1,658</b>	<b>579</b>	<b>1,079</b>	<b>17,891</b>	<b>17,640</b>
<b>Middlesex, CT</b>	<b>No</b>	<b>15</b>	<b>1,173</b>	<b>641</b>	<b>533</b>	<b>2,684</b>	<b>6,941</b>
<b>Somerset, NJ</b>	<b>Yes</b>	<b>15</b>	<b>801</b>	<b>451</b>	<b>349</b>	<b>577</b>	<b>7,886</b>
<b>Hartford, CT</b>	<b>No</b>	<b>14</b>	<b>2,713</b>	<b>1528</b>	<b>1,185</b>	<b>5,301</b>	<b>24,631</b>

<b>Passaic, NJ</b>	<b>Yes</b>	<b>12</b>	<b>755</b>	<b>471</b>	<b>284</b>	<b>733</b>	<b>8,770</b>
Putnam, NY	No	9	636	306	329	1,116	5,367
Litchfield, CT	No	8	1,671	949	721	1,234	4,400
Dutchess, NY	No	7	1,711	783	929	4,637	7,955
Ocean, NJ	No	6	1,540	993	547	1,060	9,578
Hunterdon, NJ	No	6	769	454	316	556	3,882
Sussex, NJ	No	5	1,270	744	526	669	2,726
Warren, NJ	Yes, Partial - Allentown-Bethlehem-Easton PA-NJ	5	1,105	588	517	563	5,088
Ulster, NY	No	3	1,891	903	988	3,167	6,054
Sullivan, NY	No	1	1,096	561	535	922	2,203
Pike, PA	No	1	802	419	384	266	2,353

**Table 1. PM<sub>2.5</sub> Related Emissions and Contributing Emissions Score**

Generally, New York and New Jersey Counties that are in the existing 1997 PM<sub>2.5</sub> NAAQS nonattainment area for the New York City metropolitan area have much higher emissions than the adjacent counties. CES scores were generally low for the adjacent counties as well, which is indicative of low impact on the violating monitors that violate the 2006 PM<sub>2.5</sub> NAAQS in the area.

In New York State, the counties with relatively high emissions include Suffolk, Queens, Nassau, Kings, New York, Westchester, and Orange Counties. Dutchess, Ulster, the Bronx, Richmond, and Rockland emissions were generally mid-range when compared to the other counties in the New York Metropolitan area. CES values were indicative of emissions levels, with the exception of Dutchess and Ulster Counties. CES scores were 7 and 3 respectively for Dutchess and Ulster, which are indicative of minimal contribution to violating monitors from Dutchess and Ulster emissions. Please see Factor 6, Meteorology, for further discussion on impact of emissions from Dutchess and Ulster County

Putnam and Sullivan Counties in New York have low emissions in comparison to the other counties in the area. Putnam, NY emissions account for about one percent (i.e. 636 tons) of the total PM<sub>2.5</sub>, one percent carbon emissions (i.e. 306 tons), less than half a percent of total SO<sub>2</sub> (1,116 tons), and one percent of NO<sub>2</sub> emissions (i.e. 5,367 tons) for the area under consideration. Sullivan County emissions represent about two percent of the total PM<sub>2.5</sub> (1,096 tons), two percent of the carbon emissions (i.e. 561 tons), less than half a percent each of total SO<sub>2</sub> (922 tons) and NO<sub>2</sub> emissions (i.e. 2,203 tons) for the area under consideration. CES scores were 9 and 1 on a scale of 100 for Putnam and Sullivan, respectively, indicating minimal contribution to counties with violating monitors.

In their December 2007 recommendation to EPA, New York used the 2005 emission inventory from EPA. New York included data for PM<sub>2.5</sub> direct, NO<sub>x</sub>, SO<sub>x</sub>, ammonia, organic carbon, elemental carbon, and crustal emissions. New York also showed relatively higher emissions for Suffolk, Queens, Nassau, Kings, New York, Westchester, and Orange Counties, and lower emissions for Dutchess, the Bronx, Richmond, Rockland, and Putnam. New York did not include emissions data for Ulster or Sullivan Counties.

Putnam and Sullivan Counties have low emissions, and very low CES scores. Based on high emission levels and high CES values, Suffolk, Nassau, Kings, New York, Westchester, Bronx, Richmond, Queens, Orange, Rockland, Dutchess, and Ulster counties are candidates for a 24-hour PM<sub>2.5</sub> nonattainment designation.

In New Jersey, the counties with relatively high emissions include Hudson, Middlesex, Bergen, Essex, Union, and Monmouth. Mercer, Morris, and Ocean were generally mid-range when compared to the other counties in the New York Metropolitan area. Somerset, Passaic, Hunterdon, Warren, and Sussex had low emissions in comparison to the other counties in the area. CES values were generally consistent with these emissions levels, with the exception of Ocean County. The Ocean County CES score was 6 on a scale of 100, which is indicative of minimal contribution to violating monitors from Ocean County emissions. Please see factor 6, Meteorology, for further discussion on impact of emissions from Ocean County.

Hunterdon, NJ emissions account for slightly over one percent (i.e. 769 tons) of the total PM<sub>2.5</sub> emissions, one and half percent of the carbon emissions (i.e. 454 tons), and less than one percent of the total SO<sub>2</sub> emissions (i.e. 556 tons) and NO<sub>x</sub> emissions (i.e. 3,882 tons) for the area. The CES score of 6 was consistent with minimal impact.

Warren County, NJ also has relatively lower emissions than most of the other counties in the area. 2005 total PM<sub>2.5</sub> and carbon emissions were 1,105 tons and 588 tons, respectively, which represents about two percent of the total and carbon emissions for the area under consideration. SO<sub>2</sub> emissions (i.e. 563 tons) and NO<sub>x</sub> emissions (i.e. 5,088 tons) were less than one percent of area emissions. The CES score of 5 was consistent with low contribution.

Sussex County, NJ had low total PM<sub>2.5</sub> (1,270 tons), carbon (744 tons), SO<sub>2</sub> (669 tons), and NO<sub>x</sub> emissions (2,726 tons). The CES score was 5 on a scale of 100 indicating minimal contribution to the county with the violating monitor.

Passaic and Somerset County emissions were also lower than many of the other counties in the area. For Passaic total PM<sub>2.5</sub> was 755 tons, carbon emissions were 471 tons, SO<sub>2</sub> was 733 tons, and NO<sub>x</sub> emissions were 8,770 tons. Somerset emissions were 801 tons for total PM<sub>2.5</sub>, 451 tons for carbon emissions, 577 tons for SO<sub>2</sub>, and 7,886 for NO<sub>x</sub> emissions.

In its December 2007 recommendation to EPA, New Jersey used 2002 emissions and projected 2009 emissions from the 2002 MANE-VU Modeling Inventory. New Jersey also showed relatively lower emissions from Hunterdon, Warren, Sussex, Passaic, and Somerset Counties than the other counties in the area.

Based on emission levels and CES values, Hudson, Middlesex, Bergen, Essex, Union, Monmouth, Mercer, Morris, and Ocean are candidates for a 24-hour PM<sub>2.5</sub> nonattainment designation. Passaic and Somerset Counties had CES scores of 12 and 15, respectively, and had relatively low emissions as shown in Table 1.

**Factor 2: Air quality data**

This factor considers the 24-hour PM<sub>2.5</sub> design values (in µg/m<sup>3</sup>) for air quality monitors in counties in the New York City Metropolitan based on data for the 2005-2007 period. A monitor’s design value indicates whether that monitor attains a specified air quality standard. The 24-hour PM<sub>2.5</sub> standards are met when the 3-year average of a monitor’s 98<sup>th</sup> percentile values are 35 µg/m<sup>3</sup> or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour PM<sub>2.5</sub> design values for counties in the New York City Metropolitan area are shown in Table 2.

County	State Recommended Nonattainment	Design Values 2005-07 (µg/m3)
<b>Bronx, NY</b>	<b>Yes</b>	<b>39</b>
<b>Kings, NY</b>	<b>Yes</b>	<b>36</b>
<b>Nassau, NY</b>	<b>Yes</b>	<b>33</b>
<b>New York, NY</b>	<b>Yes</b>	<b>39</b>
<b>Orange, NY</b>	<b>Yes</b>	<b>29</b>
<b>Queens, NY</b>	<b>Yes</b>	<b>34*</b>
<b>Richmond, NY</b>	<b>Yes</b>	<b>34</b>
<b>Rockland, NY</b>	<b>Yes</b>	<b>No monitor</b>
<b>Suffolk, NY</b>	<b>Yes</b>	<b>32*</b>
<b>Westchester, NY</b>	<b>Yes</b>	<b>33</b>
<b>Bergen, NJ</b>	<b>Yes</b>	<b>38</b>
<b>Middlesex, NJ</b>	<b>Yes</b>	<b>34*</b>

<b>Monmouth, NJ</b>	<b>Yes</b>	<b>No monitor</b>
<b>Essex, NJ</b>	<b>Yes</b>	<b>39</b>
<b>Mercer, NJ</b>	<b>Yes</b>	<b>34*</b>
<b>Hudson, NJ</b>	<b>Yes</b>	<b>42</b>
<b>Union, NJ</b>	<b>Yes</b>	<b>42</b>
<b>Morris, NJ</b>	<b>Yes</b>	<b>31*</b>
<b>Passaic, NJ</b>	<b>Yes</b>	<b>37</b>
<b>Somerset, NJ</b>	<b>Yes</b>	<b>No monitor</b>
<b>Fairfield, CT</b>	<b>Yes</b>	<b>35</b>
<b>New Haven, CT</b>	<b>Yes</b>	<b>36</b>
Hunterdon, NJ	No	No monitor
Ocean, NJ	No	31*
Sussex, NJ	No	No monitor
Warren, NJ	Yes, Partial - Allentown- Bethlehem-Easton PA-NJ	34
Pike, PA	No	No monitor
Litchfield, CT	No	27
Sullivan, NY	No	No monitor
Ulster, NY	No	No monitor
Dutchess, NY	No	No monitor
Putnam, NY	No	No monitor
Hartford, CT	No	32
Middlesex, CT	No	No monitor

*\* Data is from 2004-2006. 2005-2007 data was not available*

**Table 2. Air Quality Data**

In EPA Region 2, the Bronx, Kings, and New York Counties in New York; and Union, Essex, Hudson, Passaic, and Bergen Counties in New Jersey show a violation of the 24-hour PM<sub>2.5</sub> standard. Fairfield and New Haven Counties in CT, which are located in Region 1, also violate the 24-hour PM<sub>2.5</sub> standard.

This factor alone is not sufficient to eliminate the other counties in the New York Metropolitan area as candidates for nonattainment status. EPA considered each County's CES as well as the nine factors (plus other relevant factors or circumstances) when

determining which counties to include in the New York Metropolitan area nonattainment area.

Many of the violating monitors are near major transportation routes, which is an indication of a significant mobile source contribution. Counties in the New York Metropolitan area with large populations, and large number of commuters in the New York metropolitan area (see discussion in Factors 3 and 4 below) and limited transportation routes for goods and service delivery are relevant considerations when determining the counties to include in the nonattainment area. Figures 4 and 5 show the New York Metropolitan area, including monitor locations, and major roadways.

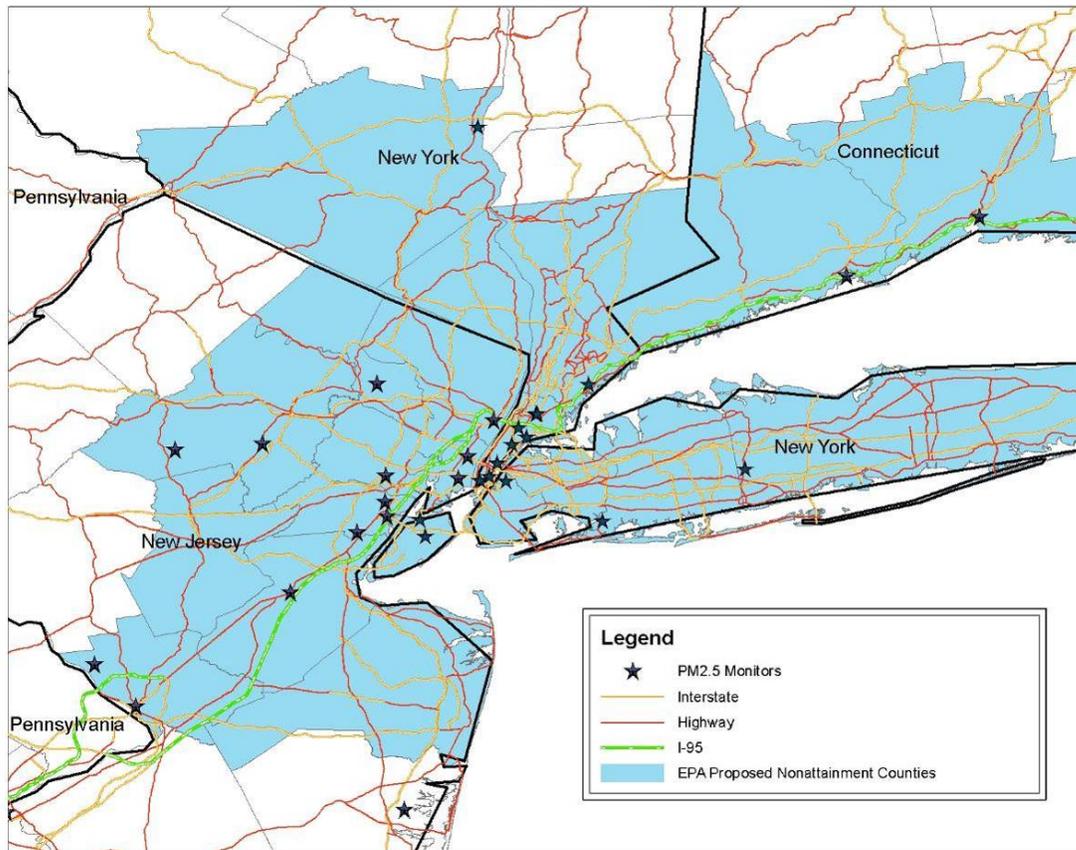


Figure 4. Map of the New York metropolitan area

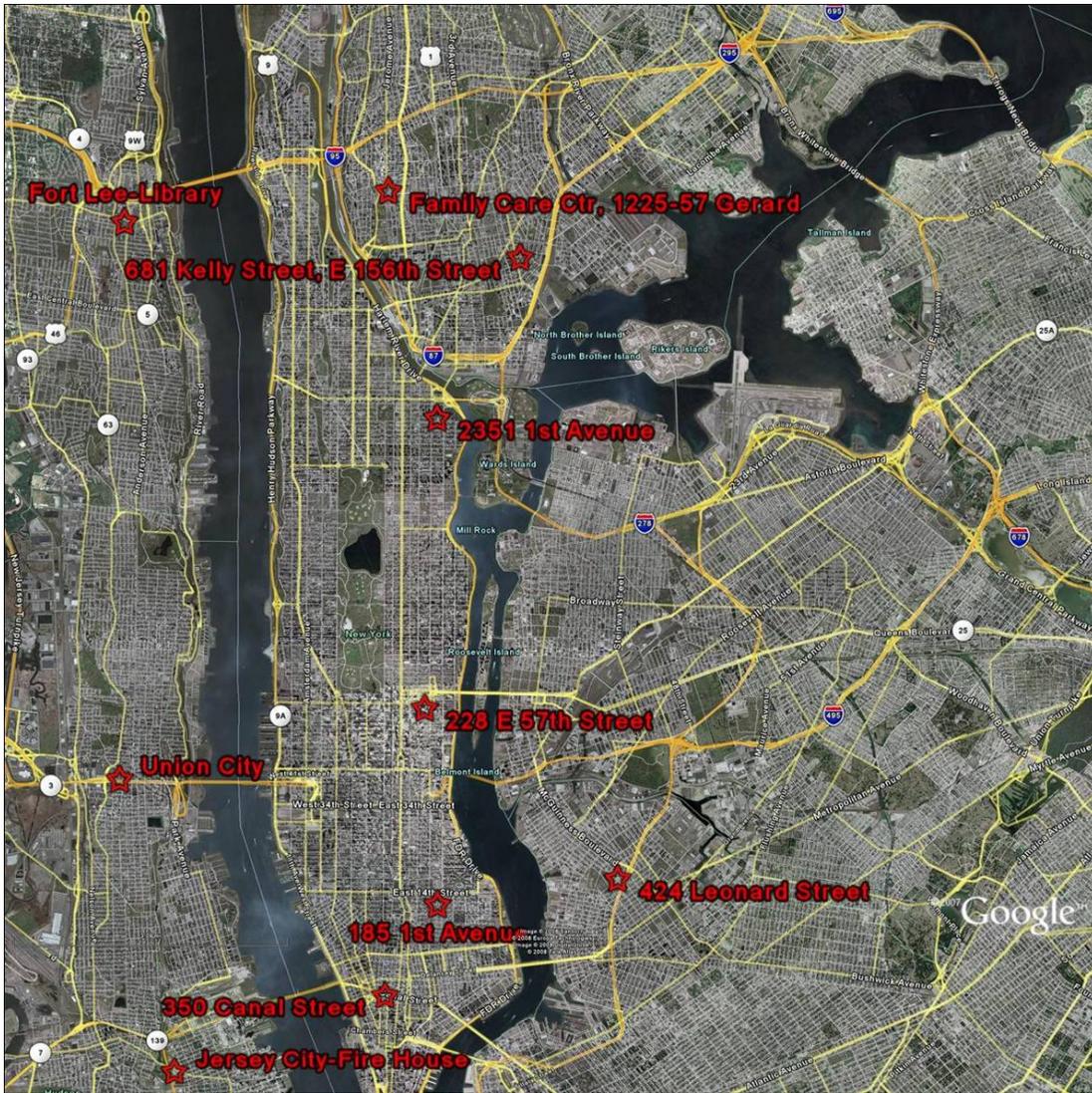


Figure 5. Detailed view of the New York City area. Red stars show the location of PM<sub>2.5</sub> monitors.

Note: Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) at population-oriented locations with a FRM or FEM monitor. All data from Special Purpose Monitors (SPM) using an FRM, FEM, or Alternative Reference Method (ARM) which has operated for more than 24 months is eligible for comparison to the relevant NAAQS, subject to the requirements given in the October 17, 2006 Revision to Ambient Air Monitoring Regulations (71 FR 61236). All monitors used to provide data must meet the monitor siting and eligibility requirements given in 71 FR 61236 to 61328 in order to be acceptable for comparison to the 24-hr PM<sub>2.5</sub> NAAQS for designation purposes.

**Factor 3: Population density and degree of urbanization (including commercial development)**

Table 3 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in the New York City Metropolitan area.

Population data give an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour PM<sub>2.5</sub> standards. Table 3 is sorted by 2005 population.

Due to their large concentrated population and relative land area size, the counties within New York City (i.e., New York, Bronx, Kings, Queens, and Richmond counties) have high population densities and high population relative to the remainder of the area. Suffolk, Nassau, Westchester, Orange, and Rockland counties in New York; and Middlesex, Essex, Monmouth, Hudson, Ocean, Union, Passaic, Morris, Mercer, and Somerset counties in New Jersey, also scored high in population and/or population density.

Of the counties listed in Table 3, most of the counties recommended for nonattainment have a CES score of greater than 10, with the exception of Hartford, CT. These high CES counties have high populations and high population densities indicating possible population-based emissions contribution.

County	State Recommended Nonattainment	2005 Population	2005 Population Density (pop/sq mi)
<b>Kings, NY</b>	<b>Yes</b>	<b>2,511,408</b>	<b>37206</b>
<b>Queens, NY</b>	<b>Yes</b>	<b>2,256,576</b>	<b>20477</b>
<b>New York, NY</b>	<b>Yes</b>	<b>1,606,275</b>	<b>70451</b>
<b>Suffolk, NY</b>	<b>Yes</b>	<b>1,472,086</b>	<b>1369</b>
<b>Bronx, NY</b>	<b>Yes</b>	<b>1,364,566</b>	<b>31882</b>
<b>Nassau, NY</b>	<b>Yes</b>	<b>1,331,620</b>	<b>4289</b>
<b>Westchester, NY</b>	<b>Yes</b>	<b>947,719</b>	<b>1989</b>
<b>Bergen, NJ</b>	<b>Yes</b>	<b>902,308</b>	<b>3718</b>
<b>Fairfield, CT</b>	<b>Yes</b>	<b>901,086</b>	<b>1385</b>
Hartford, CT	No	875,422	1168
<b>New Haven, CT</b>	<b>Yes</b>	<b>844,510</b>	<b>1358</b>
<b>Middlesex, NJ</b>	<b>Yes</b>	<b>789,283</b>	<b>2487</b>
<b>Essex, NJ</b>	<b>Yes</b>	<b>789,166</b>	<b>6099</b>
<b>Monmouth, NJ</b>	<b>Yes</b>	<b>634,841</b>	<b>1308</b>
<b>Hudson, NJ</b>	<b>Yes</b>	<b>602,970</b>	<b>11208</b>
Ocean, NJ	No	558,170	738
<b>Union, NJ</b>	<b>Yes</b>	<b>530,710</b>	<b>5035</b>

<b>Passaic, NJ</b>	<b>Yes</b>	<b>496,985</b>	<b>2525</b>
<b>Morris, NJ</b>	<b>Yes</b>	<b>490,084</b>	<b>1019</b>
<b>Richmond, NY</b>	<b>Yes</b>	<b>475,014</b>	<b>7625</b>
<b>Orange, NY</b>	<b>Yes</b>	<b>372,750</b>	<b>445</b>
<b>Mercer, NJ</b>	<b>Yes</b>	<b>366,070</b>	<b>1601</b>
<b>Somerset, NJ</b>	<b>Yes</b>	<b>319,830</b>	<b>1049</b>
<b>Rockland, NY</b>	<b>Yes</b>	<b>294,636</b>	<b>1479</b>
Dutchess, NY	No	294,509	357
Ulster, NY	No	182,433	157
Sussex, NJ	No	152,726	285
Hunterdon, NJ	No	130,042	297
Warren, NJ	Yes, Partial - Allentown-Bethlehem-Easton PA-NJ	110,317	305
Putnam, NY	No	100,528	409
Sullivan, NY	No	76,155	77

*Note: The counties that are in the nonattainment area for the 1997 PM<sub>2.5</sub> NAAQS are shown in boldface.*

**Table 3. Population**

#### **Factor 4: Traffic and commuting patterns**

This factor considers the number of commuters in each county who drive to another county within the New York City Metropolitan area, the percent of total commuters in each county who commute to violating counties within the New York City Metropolitan area, as well as the total Vehicle Miles Traveled (VMT) for each County in millions of miles (see Table 4). A county with numerous commuters is generally an integral part of an urban area and could be an appropriate county for implementing mobile-source emission control strategies, thus warranting inclusion in the nonattainment area.

The listing of counties in Table 4 reflects a ranking based on the number of people commuting to any violating county.

County	State Recommended Non-attainment?	2005 VMT (million miles)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting into statistical area	Percent Commuting into statistical area
<b>Kings, NY</b>	<b>Yes</b>	<b>4,899</b>	<b>861,160</b>	<b>96</b>	<b>895,130</b>	<b>99</b>

<b>Queens, NY</b>	<b>Yes</b>	<b>7,839</b>	<b>833,770</b>	<b>90</b>	<b>925,290</b>	<b>99</b>
<b>New York, NY</b>	<b>Yes</b>	<b>4,378</b>	<b>718,530</b>	<b>95</b>	<b>742,870</b>	<b>99</b>
<b>Bergen, NJ</b>	<b>Yes</b>	<b>9,124</b>	<b>394,140</b>	<b>92</b>	<b>424,530</b>	<b>99</b>
<b>Fairfield, CT</b>	<b>Yes</b>	<b>7,649</b>	<b>387,340</b>	<b>93</b>	<b>413,090</b>	<b>99</b>
<b>Bronx, NY</b>	<b>Yes</b>	<b>4,721</b>	<b>374,820</b>	<b>90</b>	<b>412,900</b>	<b>100</b>
<b>New Haven, CT</b>	<b>Yes</b>	<b>6,948</b>	<b>343,410</b>	<b>89</b>	<b>353,820</b>	<b>91</b>
<b>Essex, NJ</b>	<b>Yes</b>	<b>5,611</b>	<b>281,290</b>	<b>86</b>	<b>325,570</b>	<b>99</b>
<b>Hudson, NJ</b>	<b>Yes</b>	<b>2,543</b>	<b>244,470</b>	<b>93</b>	<b>262,640</b>	<b>99</b>
<b>Nassau, NY</b>	<b>Yes</b>	<b>11,920</b>	<b>201,260</b>	<b>33</b>	<b>616,330</b>	<b>100</b>
<b>Passaic, NJ</b>	<b>Yes</b>	<b>3,302</b>	<b>186,060</b>	<b>89</b>	<b>208,770</b>	<b>99</b>
<b>Union, NJ</b>	<b>Yes</b>	<b>4,704</b>	<b>181,030</b>	<b>76</b>	<b>237,010</b>	<b>100</b>
<b>Westchester, NY</b>	<b>Yes</b>	<b>9,166</b>	<b>141,680</b>	<b>33</b>	<b>421,720</b>	<b>99</b>
<b>Richmond, NY</b>	<b>Yes</b>	<b>2,002</b>	<b>97,040</b>	<b>51</b>	<b>190,220</b>	<b>100</b>
<b>Middlesex, NJ</b>	<b>Yes</b>	<b>8,014</b>	<b>90,710</b>	<b>25</b>	<b>358,740</b>	<b>99</b>
<b>Suffolk, NY</b>	<b>Yes</b>	<b>19,815</b>	<b>81,780</b>	<b>12</b>	<b>667,130</b>	<b>100</b>
<b>Morris, NJ</b>	<b>Yes</b>	<b>5,398</b>	<b>77,050</b>	<b>32</b>	<b>236,040</b>	<b>99</b>
<b>Monmouth, NJ</b>	<b>Yes</b>	<b>6,230</b>	<b>55,040</b>	<b>19</b>	<b>287,550</b>	<b>99</b>
<b>Rockland, NY</b>	<b>Yes</b>	<b>2,731</b>	<b>43,780</b>	<b>33</b>	<b>131,200</b>	<b>99</b>
<b>Somerset, NJ</b>	<b>Yes</b>	<b>2,702</b>	<b>32,080</b>	<b>21</b>	<b>148,750</b>	<b>99</b>
<b>Orange, NY</b>	<b>Yes</b>	<b>4,696</b>	<b>24,190</b>	<b>16</b>	<b>150,080</b>	<b>99</b>
Hartford, CT	No	7,951	20,400	5	24,380	6
Sussex, NJ	No	889	17,000	23	70,640	97
Ocean, NJ	No	3,367	16,910	8	197,230	94
Putnam, NY	No	3,085	11,330	24	47,860	100
<b>Mercer, NJ</b>	<b>Yes</b>	<b>2,668</b>	<b>11,130</b>	<b>7</b>	<b>150,970</b>	<b>93</b>
Dutchess, NY	No	3,180	8,720	7	126,440	99
Hunterdon, NJ	No	929	8,150	13	58,450	94
Warren, NJ	Yes, Partial - Allentown-Bethlehem-Easton PA-NJ	1,342	7,160	14	26,220	52

Ulster, NY	No	2,208	2,770	3	78,640	97
Sullivan, NY	No	784	1,720	6	9,090	31

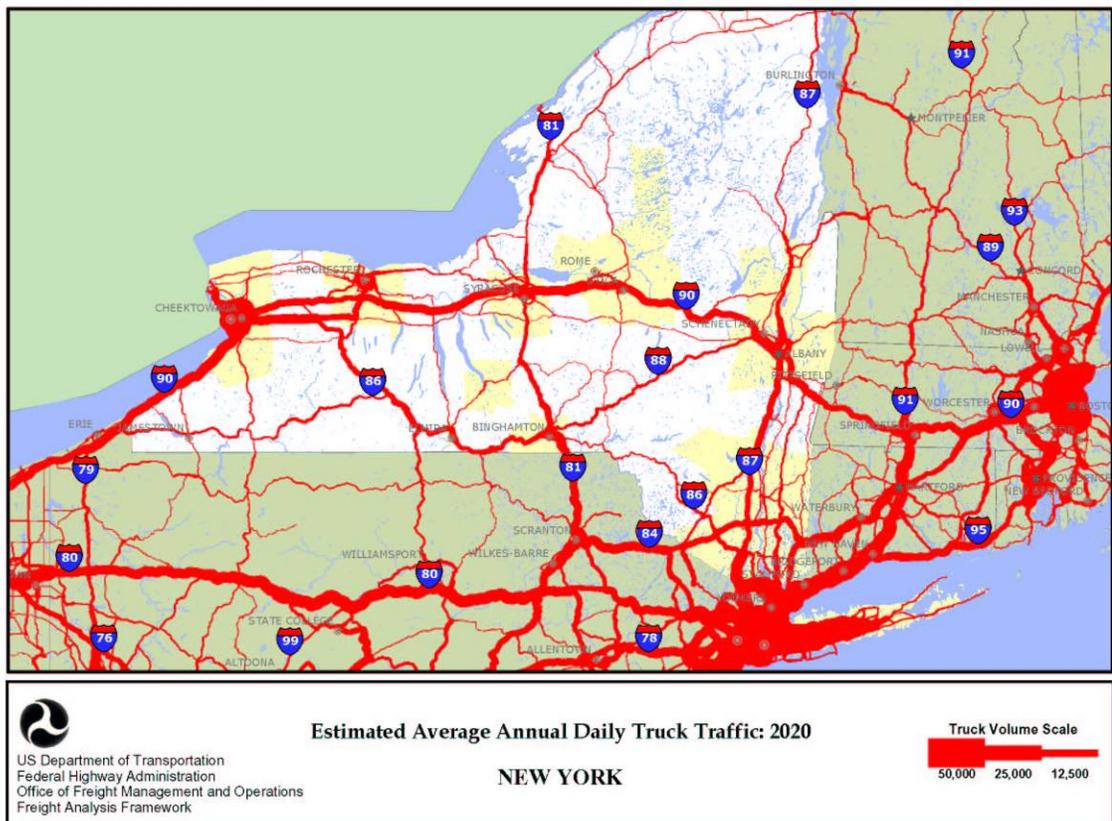
*Note: The counties that are in the nonattainment area for the 1997 PM<sub>2.5</sub> NAAQS are shown in boldface.*

**Table 4. Traffic and Commuting Patterns**

The largest number of commuters to counties with violating monitors in New York and New Jersey are from Kings, Queens, and New York. The New York counties of the Bronx, Nassau, Westchester, Richmond, Suffolk, Rockland, Orange; and the New Jersey counties of Bergen, Essex, Hudson, Passaic, Union, Middlesex, Morris, Monmouth, and Somerset, have about 25,000 commuters into a violating area.

Data provided by New Jersey indicates that only 7,647 commuters from Ocean County go to New York (2,964), Bronx (115), and Union County (4,567), which reduces the impact of this factor for Ocean County on the CSA.

The New York metro area has a large amount of truck traffic. The Federal Highway Administration projection of 2020 shows an increase of annual average daily traffic, which played a role in including counties for designation. Figure 6 shows projected 2020 annual average daily truck traffic.



**Figure 6. Estimated Average Annual Daily Truck Traffic in 2020**

This factor played a role in our decision making process by highlighting the contributing role that counties with high numbers of commuters have toward violating areas.

Note: The 2005 VMT data used for Table 4 and 5 of the 9-factor analysis has been derived using methodology similar to that described in “Documentation for the final 2002 Mobile National Emissions Inventory, Version 3, September 2007, prepared for the Emission Inventory Group, U.S. EPA. This document may be found at: [atftp://ftp.epa.gov/EmisInventory/2002finalnei/documentation/mobile/2002\\_mobile\\_nei\\_version\\_3\\_report\\_092807.pdf](http://ftp.epa.gov/EmisInventory/2002finalnei/documentation/mobile/2002_mobile_nei_version_3_report_092807.pdf)

The 2005 VMT data were taken from documentation which is still draft, but which should be released in 2008.

**Factor 5: Growth rates and patterns**

This factor looks at population (2005), expected population change (2000-2005), VMT (2005), and VMT growth (1996-2005) for counties in the New York metropolitan area. A county with rapid population or VMT growth is generally an integral part of an urban area and could be an appropriate county for implementing mobile-source and other emission-control strategies, thus warranting inclusion in the nonattainment area.

Table 5 below shows population, population growth, VMT and VMT growth for counties that are included in the New York metropolitan area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

County	2005 Population	Percent Population Change (2000-05)	Vehicle Miles Traveled in 2005 (millions annually)	Percent VMT Growth (1996-2005)
Putnam, NY	100,528	4	3,085	347
<b>Suffolk, NY</b>	<b>1,472,086</b>	<b>3</b>	<b>19,815</b>	<b>191</b>
<b>Westchester, NY</b>	<b>947,719</b>	<b>2</b>	<b>9,166</b>	<b>123</b>
<b>Rockland, NY</b>	<b>294,636</b>	<b>2</b>	<b>2,731</b>	<b>111</b>
<b>Nassau, NY</b>	<b>1,331,620</b>		<b>11,920</b>	<b>89</b>
<b>Morris, NJ</b>	<b>490,084</b>	<b>4</b>	<b>5,398</b>	<b>56</b>
<b>Middlesex, NJ</b>	<b>789,283</b>	<b>5</b>	<b>8,014</b>	<b>56</b>
Greene, NY	49,559	3	811	53
<b>Bergen, NJ</b>	<b>902,308</b>	<b>2</b>	<b>9,124</b>	<b>52</b>
<b>Somerset, NJ</b>	<b>319,830</b>	<b>7</b>	<b>2,702</b>	<b>39</b>
<b>Orange, NY</b>	<b>372,750</b>	<b>9</b>	<b>4,696</b>	<b>39</b>
<b>Monmouth, NJ</b>	<b>634,841</b>	<b>3</b>	<b>6,230</b>	<b>37</b>
Ulster, NY	182,433	3	2,208	37
Columbia, NY	63,327		848	34
Delaware, NY	47,360	(1)	564	33

Sullivan, NY	76,155	3	784	33
<b>Union, NJ</b>	<b>530,710</b>	<b>1</b>	<b>4,704</b>	<b>31</b>
New London, CT	264,265	2	3,181	21
Dutchess, NY	294,509	5	3,180	21
<b>New Haven, CT</b>	<b>844,510</b>	<b>2</b>	<b>6,948</b>	<b>10</b>
<b>Fairfield, CT</b>	<b>901,086</b>	<b>2</b>	<b>7,649</b>	<b>9</b>
Hartford, CT	875,422	2	7,951	8
<b>Richmond, NY</b>	<b>475,014</b>	<b>7</b>	<b>2,002</b>	<b>8</b>
Ocean, NJ	558,170	9	3,367	5
<b>Passaic, NJ</b>	<b>496,985</b>	<b>1</b>	<b>3,302</b>	<b>3</b>
Warren, NJ	110,317	7	1,342	2
<b>Essex, NJ</b>	<b>789,166</b>		<b>5,611</b>	<b>(1)</b>
<b>Queens, NY</b>	<b>2,256,576</b>	<b>1</b>	<b>7,839</b>	<b>(18)</b>
<b>Bronx, NY</b>	<b>1,364,566</b>	<b>2</b>	<b>4,721</b>	<b>(20)</b>
<b>Mercer, NJ</b>	<b>366,070</b>	<b>4</b>	<b>2,668</b>	<b>(22)</b>
Sussex, NJ	152,726	6	889	(22)
<b>Hudson, NJ</b>	<b>602,970</b>	<b>(1)</b>	<b>2,543</b>	<b>(37)</b>
<b>New York, NY</b>	<b>1,606,275</b>	<b>4</b>	<b>4,378</b>	<b>(40)</b>
Hunterdon, NJ	130,042	6	929	(42)
<b>Kings, NY</b>	<b>2,511,408</b>	<b>2</b>	<b>4,899</b>	<b>(57)</b>

*Note: The counties that are in the nonattainment area for the 1997 PM<sub>2.5</sub> NAAQS are shown in boldface.*

**Table 5. Population and VMT Growth and Percent Change**

In New York, the counties of the Bronx, Kings, New York, Orange, Queens, Richmond, Rockland, Suffolk, Westchester, Dutchess, Putnam, Ulster, and Sullivan all exhibited growth. New York projects that the population in Bronx, Kings, New York, Orange, Queens, Richmond, Rockland, Suffolk, Westchester, Dutchess, and Putnam will continue to grow through 2015. In New Jersey, Middlesex, Monmouth, Hudson, Morris, Warren, Hunterdon, Sussex, and Ocean counties are experiencing growth. Somerset County is experiencing significant growth percentage-wise and in absolute numbers.

The VMT growth for Putnam, Suffolk, Westchester, and Rockland more than doubled from 1996-2005. Other areas in NY that had significant VMT growth were: Orange, Dutchess, Sullivan and Ulster. In NJ, Somerset, Middlesex, Morris, Monmouth, Bergen, and Union had notable VMT growth from 1996-2005.

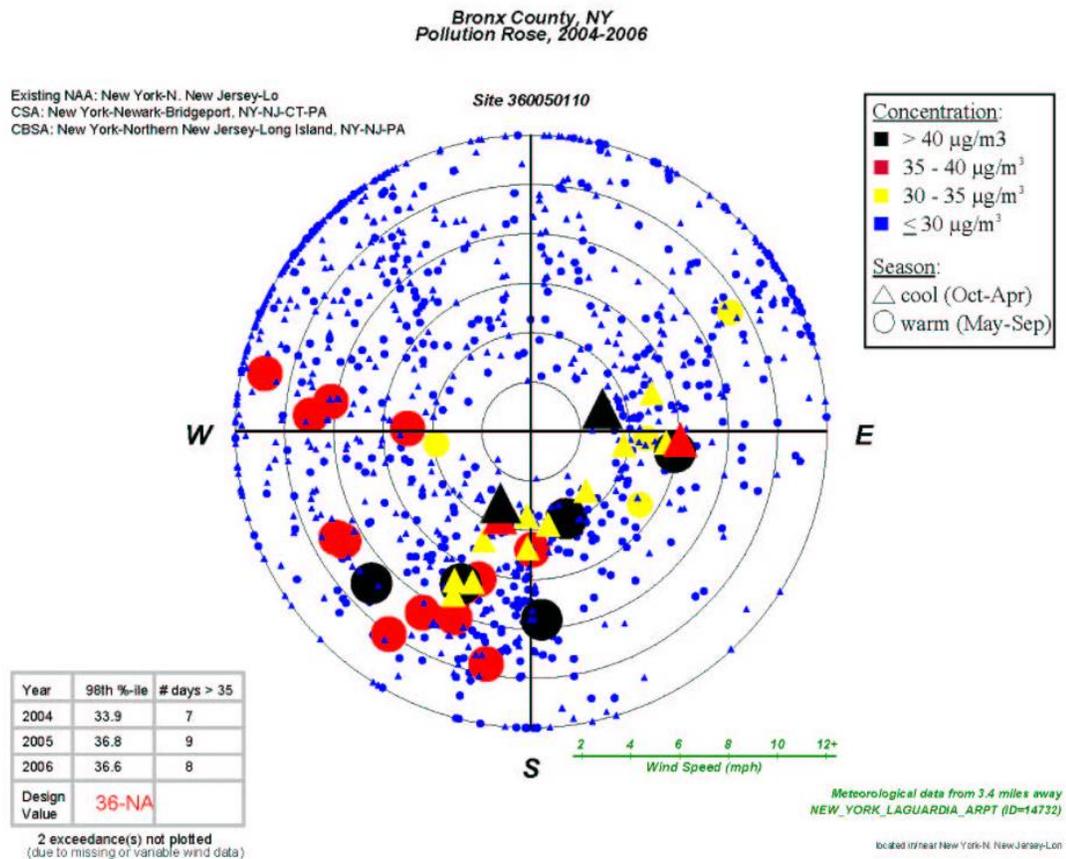
This factor played a role in our decision process as it showed that in most of the counties in the proposed New York City Metropolitan nonattainment area there is continued growth in both population and VMT.

**Factor 6: Meteorology (weather/transport patterns)**

For this factor, EPA considered the most representative National Weather Service wind direction and speed data throughout the year, with an emphasis on “high PM<sub>2.5</sub> days” for

each of two seasons (an October-April “cold” season and a May-September “warm” season). These high days are defined as days where any FRM or FEM air-quality monitors had 24-hour  $PM_{2.5}$  concentrations above 95% on a frequency distribution curve of  $PM_{2.5}$  24-hour values.

For each air quality monitoring site, EPA developed a “pollution rose” to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The figure identifies 24-hour  $PM_{2.5}$  values by color; days exceeding  $35 \mu g/m^3$  are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center. For this factor, EPA also considered each County’s CES, which includes an analysis of trajectories of air masses for high  $PM_{2.5}$  days. Figures 7, 8, and 9 show pollution roses for the New York Metropolitan Area.

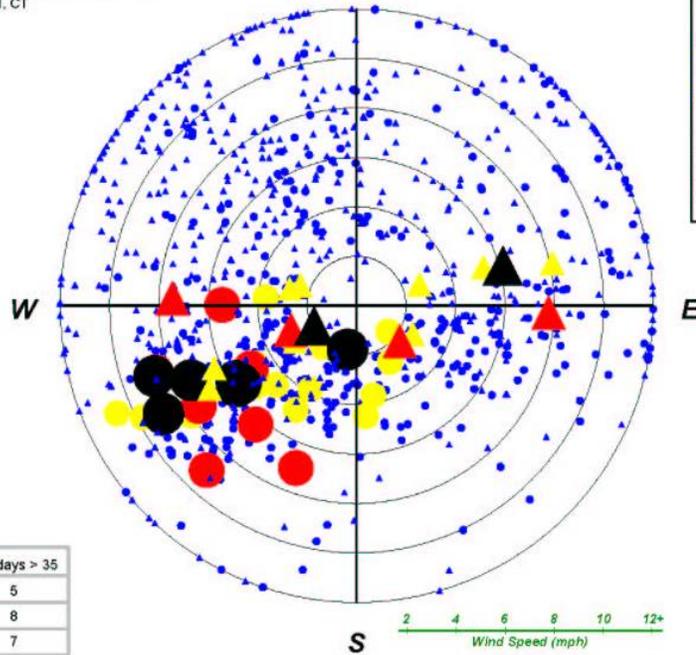


**Figure 7. Pollution Rose for Bronx County, NY**

New Haven County, CT  
Pollution Rose, 2004-2006

Existing NAA: New York-N. New Jersey-Lo  
CSA: New York-Newark-Bridgeport, NY-NJ-CT-PA  
CBSA: New Haven-Milford, CT

Site 090090027



**Concentration:**  
 ■ > 40 µg/m<sup>3</sup>  
 ■ 35 - 40 µg/m<sup>3</sup>  
 ■ 30 - 35 µg/m<sup>3</sup>  
 ■ ≤ 30 µg/m<sup>3</sup>

**Season:**  
 △ cool (Oct-Apr)  
 ○ warm (May-Sep)

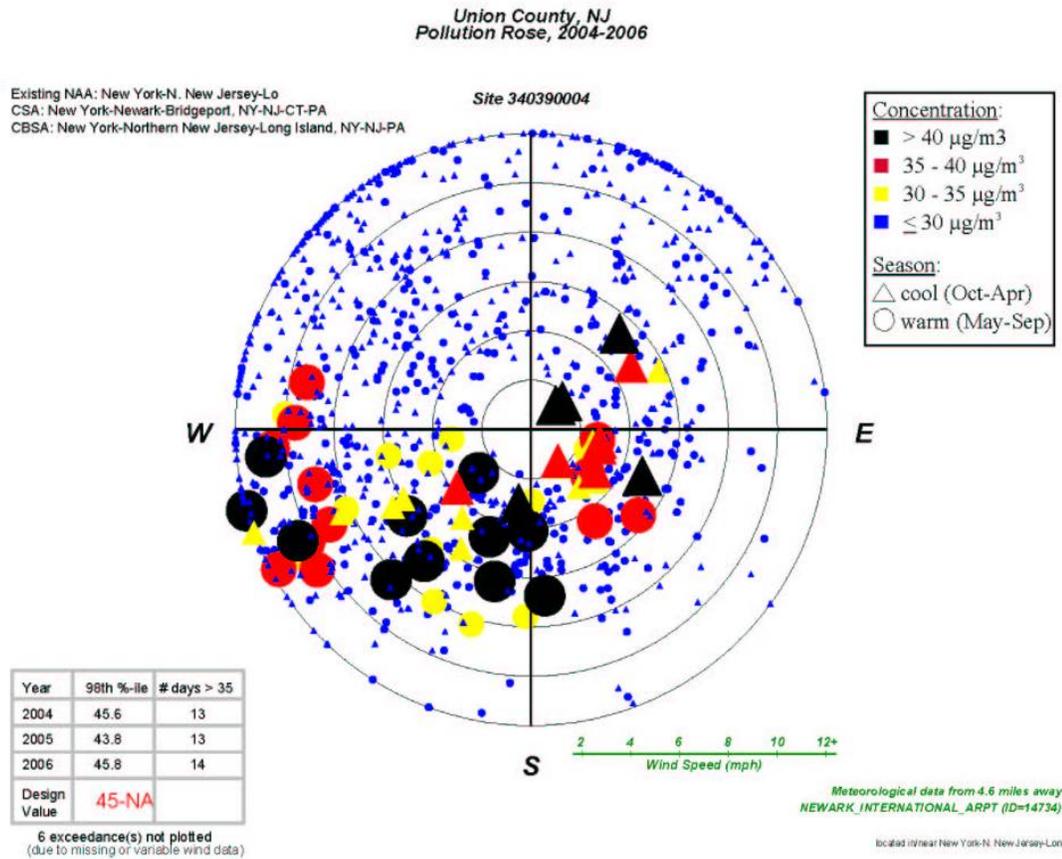
Year	98th %-ile	# days > 35
2004	36.7	5
2005	38.2	8
2006	36.7	7
Design Value	37-NA	

All exceedances plotted

Meteorological data from 15.2 miles away  
BRIDGEPORT\_SIKORSKY\_MEMORIAL (ID=94702)

located in/over New York-N. New Jersey-Lo

Figure 8. Pollution Rose for New Haven County, CT



**Figure 9. Pollution Rose for Union County, NJ**

Generally, the analysis of prevailing wind directions and pollution roses show that the counties that are in the current 1997 PM<sub>2.5</sub> NAAQS nonattainment area for New York City rank high for this factor. The counties outside the 1997 PM<sub>2.5</sub> NAAQS nonattainment area generally ranked lower.

Table 6 shows the average prevailing surface wind directions for high PM<sub>2.5</sub> days by quadrant for representative counties with violating monitors in the New York City Metropolitan area. These data show that 24-hour PM<sub>2.5</sub> concentrations are influenced by emissions in any direction at various times, but these data also suggest that emissions in some directions relative to the violation are more likely to contribute than emissions in other directions.

County	Prevailing Wind Direction (%)			
	NW	SW	SE	NE
Union County, NJ	9%	61%	22%	8%

Bronx County, NY	11%	49%	31%	9%
New Haven County, CT	8%	60%	25%	7%

**Table 6. Prevailing Wind Directions for High PM<sub>2.5</sub> Days**

EPA’s analysis of meteorology shows that PM<sub>2.5</sub> emissions during high PM<sub>2.5</sub> days in 2004-2006 primarily originated and/or passed through locations from a southerly to a southwesterly direction. This is also evident upon examination of the pollution roses (see Figures 7, 8, and 9) for the New York City Metropolitan area. In addition, the pollution roses also show that some component of elevated PM<sub>2.5</sub> measured at the nonattainment monitors may originate from a northerly direction. The roses, therefore, show the need to consider the contribution of all surrounding counties to the violating monitors in the New York City Metropolitan area. This ensures that the nonattainment area is sufficiently large enough to include both the areas that violate and the areas that contribute.

In New York State, the Counties that ranked high for this factor are Queens, Bronx, Richmond, Nassau, Kings, New York, Rockland, Westchester, and Orange. Suffolk County ranked slightly lower for this factor.

Ulster and Dutchess Counties were not shown to contribute significantly based on the analysis of meteorology. Ulster County is north to northwest of violating monitors in New York, New Jersey and Connecticut. Pollution roses and the prevailing wind direction did not indicate a high impact from this area. The CES score was very low (i.e. 3 on a scale of 100). Dutchess County is northwest of violating monitors in Connecticut, and northeast of violating monitors in New York and New Jersey. Pollution roses and the prevailing wind direction did not indicate a high impact from this area either.

In New Jersey, the Counties that rank high for this factor are Union, Bergen, Essex, Hudson, Mercer, Middlesex, Monmouth, Morris, Passaic, and Somerset Counties.

Ocean County is generally south of violating monitors in New Jersey and New York, and southwest of violating monitors in CT. The Ocean County CES score was very low (6), and pollution roses did not indicate a high impact from Ocean County to areas that violate.

Based on our analysis, this factor supports including the Counties of New York, Bronx, Queens, Kings, Richmond, Nassau, Suffolk, Westchester, Orange, and Rockland Counties in New York; and Union, Bergen, Essex, Hudson, Mercer, Middlesex, Monmouth, Morris, Passaic, and Somerset in New Jersey in the New York City metropolitan nonattainment area.

Note: the meteorology factor is also considered in each county’s Contributing Emissions Score because the method for deriving this metric included an analysis of trajectories of air masses for high PM<sub>2.5</sub> days.

**Factor 7: Geography/topography (mountain ranges or other air basin boundaries)**

The geography/topography analysis looks at physical features of the land that might have an effect on the air shed and, therefore, on the distribution of PM<sub>2.5</sub> over the New York Metropolitan area.

The New York City Metropolitan area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

**Factor 8: Jurisdictional boundaries (e.g., existing PM and ozone areas)**

In evaluating the jurisdictional boundary factor, consideration should be given to existing boundaries and organizations that may facilitate air quality planning and the implementation of control measures to attain the standard. Areas designated as nonattainment (e.g. for PM<sub>2.5</sub> or 8-hour ozone standard) represent important boundaries for state air quality planning.

The major jurisdictional boundaries in the New York City Metropolitan nonattainment area are the State lines between New York, New Jersey, and Connecticut.

All counties in New Jersey were designated nonattainment for the 8-hour ozone standard on April 15, 2004. Ocean and Mercer Counties in New Jersey were associated with an ozone nonattainment area, but this was a separate and distinct area from the other counties in the New York metropolitan area. All New York counties that are candidates for a 24-hour PM<sub>2.5</sub> nonattainment designation in the New York metropolitan area were designated nonattainment for the 8-hour ozone standard, with the exception of Putnam, Sullivan, and Ulster counties. Orange and Dutchess Counties were also associated with a different ozone nonattainment area.

In EPA's June 2007 Guidance for Area Designations for the 24-hr PM<sub>2.5</sub> NAAQS, EPA had indicated that we expected that the boundaries for the existing 1997 PM<sub>2.5</sub> nonattainment areas would have been appropriate for the boundaries of the new nonattainment areas for the 2006 PM<sub>2.5</sub> NAAQS. The following counties were included in the EPA Region 2 portion of the 1997 PM<sub>2.5</sub> NAAQS nonattainment area for the New York City metropolitan area: New York, Bronx, Queens, Kings, Richmond, Nassau, Suffolk, Westchester, Orange, and Rockland Counties in New York; and Union, Bergen, Essex, Hudson, Mercer, Middlesex, Monmouth, Morris, Passaic, and Somerset Counties in New Jersey. Dutchess and Ulster Counties in New York; and Ocean County in New Jersey were not included in the 1997 PM<sub>2.5</sub> NAAQS nonattainment area for the New York City metropolitan area.

New York has recommended the same boundaries for the 24-hour PM<sub>2.5</sub> NAAQS that were previously delineated by EPA for the 1997 PM<sub>2.5</sub> nonattainment area. In their December 2007 letter New York has noted that although they disagreed with those boundaries and chose to litigate the issue, they do not expect the possible change in those

boundaries as a result of the litigation to affect their recommendation, given the more local impacts associated with the 24-hour standard, the 24-hour averaging basis for the NAAQS that is the subject of this submittal, the larger number of monitors exceeding the 24-hour standard in the New York City counties, and the values close to the 24-hour standard in the counties surrounding New York City.

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

This factor considers emission controls currently implemented in the New York City Metropolitan area.

The emission estimates on Table 1 (under Factor 1) include any control strategies implemented by the States in the New York City Metropolitan area before 2005 that may influence emissions of any component of PM<sub>2.5</sub> emissions (i.e., total carbon, SO<sub>2</sub>, NO<sub>x</sub>, and crustal PM<sub>2.5</sub>). Since we believe that the emissions listed in Table 1 have not changed significantly since 2005, this factor does not influence heavily in our decision-making.

In considering county-level emissions, EPA considered 2005 emissions data from the National Emissions Inventory. EPA recognizes that certain power plants or large sources of emissions in this potential nonattainment area may have installed emission controls or otherwise significantly reduced emissions since 2005 and that this information may not be reflected in this analysis. EPA will consider additional information on emission controls in making final designation decisions. In cases where specific plants already have installed emission controls or plan to install such controls in the near future, EPA requests additional information on:

- the plant name, city, county, and township/tax district
- identification of emission units at the plant, fuel use, and megawatt capacity
- identification of emission units on which controls will be installed, and units on which controls will not be installed
- identification of the type of emission control that has been or will be installed on each unit, the date on which the control device became / will become operational, and the emission reduction efficiency of the control device
- the estimated pollutant emissions for each unit before and after implementation of emission controls
- whether the requirement to operate the emission control device will be federally enforceable by December 2008, and the instrument by which federal enforceability will be ensured (e.g. through source-specific SIP revision, operating permit requirement, consent decree)

## **EPA Technical Analysis for Buffalo/Niagara Falls Area (Erie & Niagara Counties)**

### Discussion

Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those areas that contribute to violations. EPA would designate an area “attainment” if the area meets the NAAQS and does not contribute to violations.

An area would be designated “unclassifiable” if an area cannot be classified on the basis of available information as meeting or not meeting the NAAQS. EPA would designate a county as “unclassifiable” when it has air quality monitoring data for the 2005-2007 time period that is not complete and cannot be used for determining compliance with the standard.

On December 18, 2007, New York recommended that Erie and Niagara Counties in the Buffalo/ Niagara Falls area be designated as unclassifiable for the 2006 24-hour PM<sub>2.5</sub> standard based upon air quality data from 2004-2006. These data are from Federal Reference Method (FRM) monitors located in the state data from 2004-2006.

New York’s unclassifiable recommendation for Erie and Niagara counties was based on the insufficient margin between the monitored values and the 24-hour PM<sub>2.5</sub> standard to support a definitive conclusion that the attainment that was monitored in the 2004-2006 period would persist. New York indicated that the annual 24-hour values were inconsistent, exhibiting no downward trend in the data. New York also noted in their recommendation that the result of the application of the nine factors required by EPA taken together does not weight this recommendation toward a clear conclusion that the area should be either attainment or nonattainment.

On March 28, 2008, EPA informed New York that Erie County may be in violation of the 2006 24-hour PM<sub>2.5</sub> standard based on data available from the first three quarters of 2007. A complete year of data for 2007 would be necessary to confirm a violation. New York was offered an opportunity to revise their designation recommendation, and submit their new recommendation to EPA in May 2008.

On June 9, 2008, EPA received a letter from New York indicating that the State continued to believe that the Buffalo/ Niagara Falls Metropolitan Statistical area (i.e. Erie and Niagara Counties) should be classified as “unclassifiable”. New York presented data for the 2005-2007 time period that showed that the air monitoring sites monitored attainment of the 24-hour PM<sub>2.5</sub> standard. Notwithstanding this, New York’s opinion was that assigning a classification of attainment or nonattainment continues to be inappropriate. While the monitored PM<sub>2.5</sub> design values have not exceeded 24-hour standards, New York has stated that there is insufficient information to determine the

attainment status of this area at this time as there is no clear indication that the monitoring data will continue to be below the 24-hour PM<sub>2.5</sub> NAAQS.

Based upon currently available information, EPA believes that the appropriate designation is “attainment/ unclassifiable”. These counties are listed in the table below.

Buffalo/Niagara Falls Area	State-Recommended Nonattainment Counties	EPA-Recommended Nonattainment Counties
	None: Erie & Niagara Counties were recommended as unclassifiable	None: Erie & Niagara Counties are recommended as attainment/unclassifiable.

The following is a summary of the air quality data for the Buffalo/Niagara Falls Area.

**Air quality data**

This factor considers the 24-hour PM<sub>2.5</sub> design values (in µg/m<sup>3</sup>) for air quality monitors in counties in the Buffalo/Niagara Falls Area based on data for the 2005-2007 period. A monitor’s design value indicates whether that monitor attains a specified air quality standard. The 24-hour PM<sub>2.5</sub> standards are met when the 3-year average of a monitor’s 98<sup>th</sup> percentile values are 35 µg/m<sup>3</sup> or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour PM<sub>2.5</sub> design values for counties in the Buffalo/Niagara Falls Area are shown in Table 7.

County	State Recommended Nonattainment	Design Values 2005-07 (µg/m <sup>3</sup> )
Erie, NY	No	33
Niagara, NY	No	34

**Table 7. Air Quality Data**

There are no counties in the Buffalo/Niagara Falls Area that show a violation of the 24-hour PM<sub>2.5</sub> standard.

Note: Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) at population-oriented locations with a FRM or FEM monitor. All data from Special Purpose Monitors (SPM) using an FRM, FEM, or Alternative Reference Method (ARM) which has operated for more than 24 months is eligible for comparison to the relevant NAAQS, subject to the requirements given in the October 17, 2006 Revision to Ambient Air Monitoring Regulations (71 FR 61236). All

monitors used to provide data must meet the monitor siting and eligibility requirements given in 71 FR 61236 to 61328 in order to be acceptable for comparison to the 24-hr PM<sub>2.5</sub> NAAQS for designation purposes.

## Attachment 2

### Description of the Contributing Emissions Score

The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Using this methodology, scores were developed for each county in and around the relevant metro area. The county with the highest contribution potential was assigned a score of 100, and other county scores were adjusted in relation to the highest county. The CES represents the relative maximum influence that emissions in that county have on a violating county. The CES, which reflects consideration of multiple factors, should be considered in evaluating the weight of evidence supporting designation decisions for each area.

The CES for each county was derived by incorporating the following significant information and variables that impact PM<sub>2.5</sub> transport:

- Major PM<sub>2.5</sub> components: total carbon (organic carbon (OC) and elemental carbon (EC)), SO<sub>2</sub>, NO<sub>x</sub>, and inorganic particles (crustal).
- PM<sub>2.5</sub> emissions for the highest (generally top 5%) PM<sub>2.5</sub> emission days (herein called “high days”) for each of two seasons, cold (Oct-Apr) and warm (May-Sept)
- Meteorology on high days using the NOAA HYSPLIT model for determining trajectories of air masses for specified days
- The “urban increment” of a violating monitor, which is the urban PM<sub>2.5</sub> concentration that is in addition to a regional background PM<sub>2.5</sub> concentration, determined for each PM<sub>2.5</sub> component
- Distance from each potentially contributing county to a violating county or counties

A more detailed description of the CES can be found at [http://www.epa.gov/ttn/naaqs/pm/pm25\\_2006\\_techinfo.html#C](http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C).