

# **Greater Connecticut Nonattainment Area**

## **Final Area Designations for the 2015 Ozone National Ambient Air Quality Standards Technical Support Document**

### **1.0 Summary**

This technical support document (TSD) describes EPA's process to designate the Greater Connecticut area (as defined within this document), as nonattainment for the 2015 ozone National Ambient Air Quality Standards (NAAQS). This TSD will focus on the Greater Connecticut area only. However, the Greater Connecticut area is not the only portion of the state of Connecticut that EPA is designating as nonattainment for the 2015 ozone NAAQS. As explained in a different TSD, it is EPA's final decision to include portions of the state of Connecticut within the separate New York Metro nonattainment area. EPA is including the three southwestern Connecticut counties of Fairfield, New Haven, and Middlesex (See Table 1) as part of the New York-Northern New Jersey-Long Island, NY-NJ-CT Nonattainment Area, also referred to as the New York Metro nonattainment Area. It is EPA's final decision to designate the entire State of Connecticut as nonattainment for the 2015 ozone NAAQS, but to split the State into two areas: Greater Connecticut and New York Metro nonattainment areas.

On October 1, 2015, the EPA promulgated revised primary and secondary ozone NAAQS (80 FR 65292; October 26, 2015). The EPA strengthened both standards to a level of 0.070 parts per million (ppm). In accordance with Section 107(d) of the Clean Air Act (CAA or Act), whenever the EPA establishes a new or revised NAAQS, the EPA must promulgate designations for all areas of the country for that NAAQS.

Under section 107(d), states were required to submit area designation recommendations to the EPA for the 2015 ozone NAAQS no later than 1 year following promulgation of the standards, i.e., by October 1, 2016. The Connecticut Department of Energy and Environmental Protection (CT DEEP) submitted its recommendation on October 1, 2016. The CT DEEP recommended that the counties shown in Table 1 be designated as nonattainment and split between two areas: Greater Connecticut area and New York Metro area. Tribes were also invited to submit area designation recommendations. The Tribes in Connecticut did not submit recommendations.

After considering Connecticut's recommendation and based on the EPA's technical analysis as described in this TSD, the EPA is designating the areas as shown in Table 1 as nonattainment for the 2015 ozone NAAQS. The EPA must designate an area nonattainment if it has an air quality monitor that is violating the standard or if it has sources of emissions that are contributing to a violation of the NAAQS in a nearby area. A description of the final nonattainment boundaries for the Greater Connecticut area are found in the supporting technical analysis.

**Table 1. Connecticut’s Recommended Nonattainment Areas and the EPA’s Final Designated Nonattainment Areas for the 2015 Ozone NAAQS.**

Area	Connecticut’s Recommended Nonattainment Counties	EPA’s Final Nonattainment Counties
Greater Connecticut (Includes Tribal Land) *	Hartford	Hartford
	Litchfield	Litchfield
	New London	New London
	Tolland	Tolland
	Windham	Windham
Connecticut Portion of the New York Metro Area**	Fairfield	Fairfield
	New Haven	New Haven
	Middlesex	Middlesex

\*Greater Connecticut is a multi-jurisdictional nonattainment area that includes areas of Indian country of Federally-recognized tribes. The areas of Indian country of each tribe that the EPA is designating as part of the nonattainment area are discussed in Section 3, Technical Analysis.

\*\* New York Metro is a multi-state area composed of counties in Connecticut, New Jersey and New York. The technical analysis for this multi-state area is discussed in a separate TSD for the New York Metro nonattainment area.

On November 6, 2017 (82 FR 54232; November 16, 2017), the EPA signed a final rule designating most of the areas the State did not recommend for designation as nonattainment as attainment/unclassifiable.<sup>1</sup> EPA explains in section 2.0 the approach it is now taking to designate the remaining areas in the State.

## 2.0 Nonattainment Area Analyses and Boundary Determination

The EPA evaluated and determined the boundaries for each nonattainment area on a case-by-case basis, considering the specific facts and circumstances of the area. In accordance with the CAA section 107(d), the EPA is designating as nonattainment the areas with the monitors that is **are** violating the 2015 ozone NAAQS and nearby areas with emissions sources (i.e., stationary, mobile, and/or area sources) that contribute to the violations. As described in the EPA’s designations guidance for the 2015 NAAQS (hereafter referred to as the

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<sup>1</sup> In previous ozone designations and in the designation guidance for the 2015 ozone NAAQS, the EPA used the designation category label Unclassifiable/Attainment to identify both areas that were monitoring attainment and areas that did not have monitors but for which the EPA had reason to believe were likely attainment and were not contributing to a violation in a nearby area. The EPA is now reversing the order of the label to be Attainment/Unclassifiable so that the category is more clearly distinguished from the separate Unclassifiable category.

“ozone designations guidance”<sup>2</sup> after identifying each monitor indicating a violation of the ozone NAAQS in an area, the EPA analyzed those nearby areas with emissions potentially contributing to the violating area. In guidance issued in February 2016, the EPA provided that using the Core Based Statistical Area (CBSA) or Combined Statistical Area (CSA)<sup>3</sup> as a starting point for the contribution analysis is a reasonable approach to ensure that the nearby areas most likely to contribute to a violating area are evaluated. The area-specific analyses may support nonattainment boundaries that are smaller or larger than the CBSA or CSA.

On November 6, 2017, the EPA issued attainment/unclassifiable designations for approximately 85% of the United States and one unclassifiable area designation.<sup>4</sup> At that time, consistent with statements in the designations guidance regarding the scope of the area the EPA would analyze in determining nonattainment boundaries, EPA deferred designation for any counties in the larger of a CSA or CBSA where one or more counties in the CSA or CBSA was violating the standard and any counties with a violating monitor not located in a CSA or CBSA. In addition, the EPA deferred designation for any other counties adjacent to a county with a violating monitor. The EPA also deferred designation for any county that had incomplete monitoring data, any county in the larger of the CSA or CBSA where such a county was located, and any county located adjacent to a county with incomplete monitoring data.

The EPA completed the remaining designations consistent with the designations guidance (and EPA’s past practice) regarding the scope of the area EPA would analyze in determining nonattainment boundaries for the ozone NAAQS as outlined above. For those deferred areas where one or more counties violating the ozone NAAQS or with incomplete data are located in a CSA or CBSA, in most cases the technical analysis for the nonattainment area includes any counties in the larger of the relevant CSA or CBSA. For counties with a violating monitor not located in a CSA or CBSA, EPA explains in the 3.0 Technical Analysis section, its decision whether to consider in the five-factor analysis for each area any other adjacent counties for which EPA previously deferred action. We are designating all counties not included in five-factor analyses for a specific nonattainment or unclassifiable area analyses, as attainment/unclassifiable. These deferred areas are identified in a separate document entitled “Designations for Deferred Counties and County Equivalents Not Addressed in the Technical Analyses.” which is available in the docket.

The EPA is designating all tribes in accordance with two guidance documents issued in December 2011 by the EPA Office of Air Quality Planning and Standards titled, “Guidance to Regions for Working with Tribes during

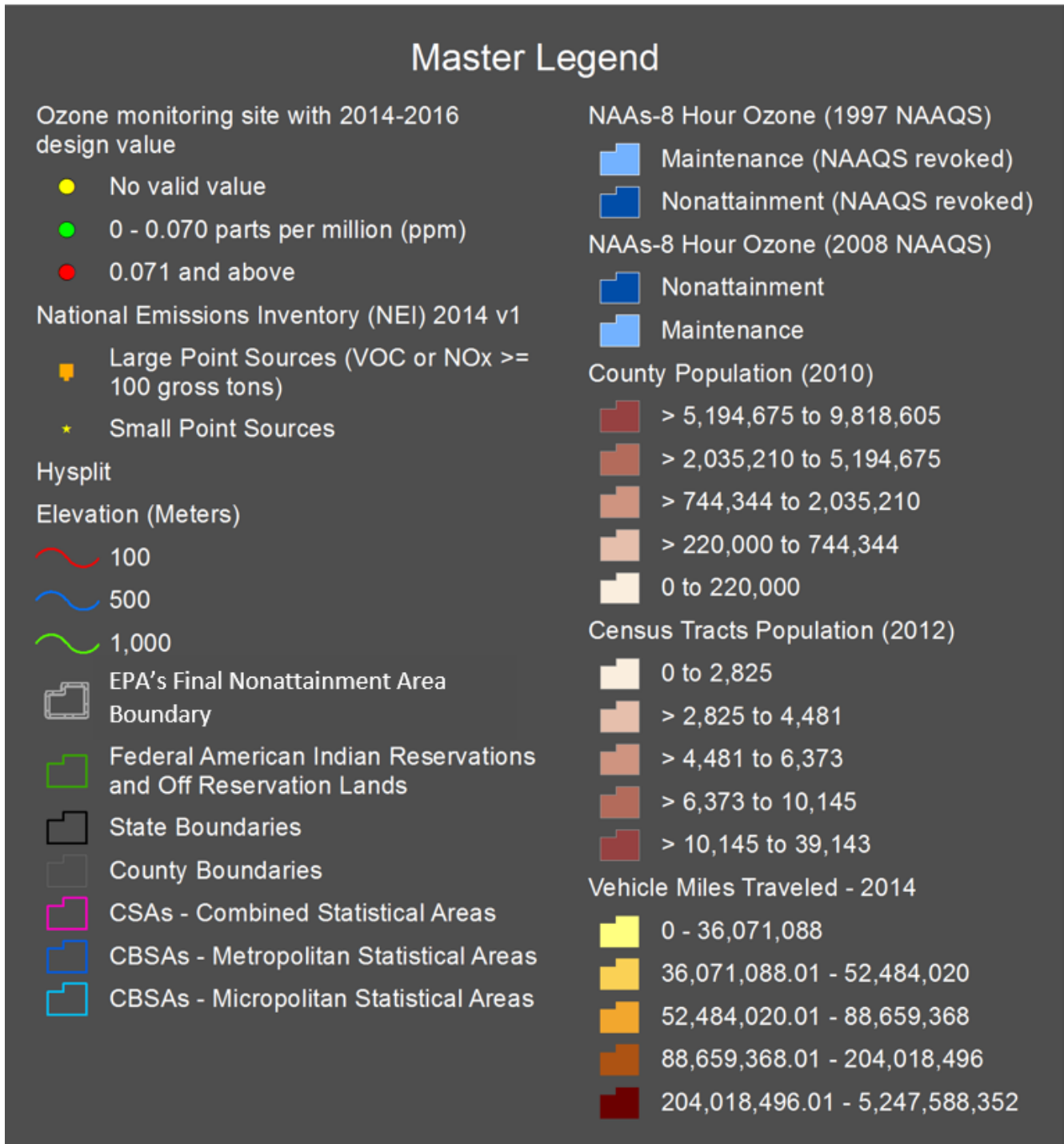
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<sup>2</sup> The EPA issued guidance on February 25, 2016 that identified important factors that the EPA will evaluate in determining appropriate area designations and nonattainment boundaries for the 2015 ozone NAAQS. Available at <https://www.epa.gov/ozone-designations/epa-guidance-area-designations-2015-ozone-naaqs>

<sup>3</sup> Lists of CBSAs and CSAs and their geographic components are provided at [www.census.gov/population/www/metroareas/metrodef.html](http://www.census.gov/population/www/metroareas/metrodef.html). The Office of Management and Budget (OMB) adopts standards for defining statistical areas. The statistical areas are delineated based on U.S. Census Bureau data. The lists are periodically updated by the OMB. The EPA used the most recent July 2015 update (OMB Bulletin No. 15-01), which is based on application of the 2010 OMB standards to the 2010 Census, 2006-2010 American Community Survey, as well as 2013 Population Estimates Program data.

<sup>4</sup> Air Quality Designations for the 2015 Ozone National Ambient Air Quality Standards published on November 16, 2017(82 FR 54232).

the National Ambient Air Quality Standards (NAAQS) Designations Process,”<sup>5</sup> and “Policy for Establishing Separate Air Quality Designations for Areas of Indian Country.”<sup>6</sup>



Figures in the remainder of this document refer to the master legend above.

<sup>5</sup> <https://www.epa.gov/sites/production/files/2016-02/documents/ozone-designation-tribes.pdf>

<sup>6</sup> <https://www.epa.gov/sites/production/files/2016-02/documents/indian-country-separate-area.pdf>

### 3.0 Technical Analysis for Greater Connecticut

The area of analysis includes 3 counties in the Hartford-West Hartford, CT CBSA, which is comprised of 4 counties: Hartford, Middlesex, New London, and Tolland. (Middlesex County, which the State of Connecticut has recommended to be nonattainment, is discussed in the TSD for the New York Metro area and will not be analyzed in this TSD.) It also includes counties that are part of two other CSAs: Windham County, Connecticut, which is part of the Boston-Worcester-Providence CSA; and Litchfield County, which is part of the New York City CSA.

Thus, the area of analysis consists of the following five counties; Hartford, Litchfield, New London, Tolland and Windham. These are also the five Connecticut Counties that the State recommended to be in the Greater Connecticut nonattainment area. The remaining three counties in Connecticut are: Fairfield, New Haven and Middlesex, these are also designated as nonattainment, but are part of a separate nonattainment area: The New York Metro area. (In sum, all of Connecticut is recommended by the State to be nonattainment and is designated, by EPA, to be nonattainment, the only issue is how to split the State between two different nonattainment areas). This TSD focuses on the 5 counties in the State recommended Greater Connecticut nonattainment area.

The area of analysis for the Greater Connecticut area includes five ozone monitors. Four of the five ozone monitors violate the 2015 ozone NAAQS, and only the Abington ozone monitor (in Windham County) has air quality that meets the NAAQS (see Table 2). The EPA evaluated the Greater Connecticut area and any nearby areas to determine whether those nearby areas have enough ozone precursor (Volatile Organic Compounds (VOCs) and oxides of Nitrogen (NO<sub>x</sub>)) emissions sources that may potentially contribute to ambient ozone concentrations at the violating monitors in the Greater Connecticut. area, based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance, and any other relevant information. In developing this technical analysis, the EPA used the data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).<sup>7</sup> In addition, the EPA considered all additional data and information provided to the EPA by the public, states and tribes.

The five factors recommended in the EPA's guidance are:

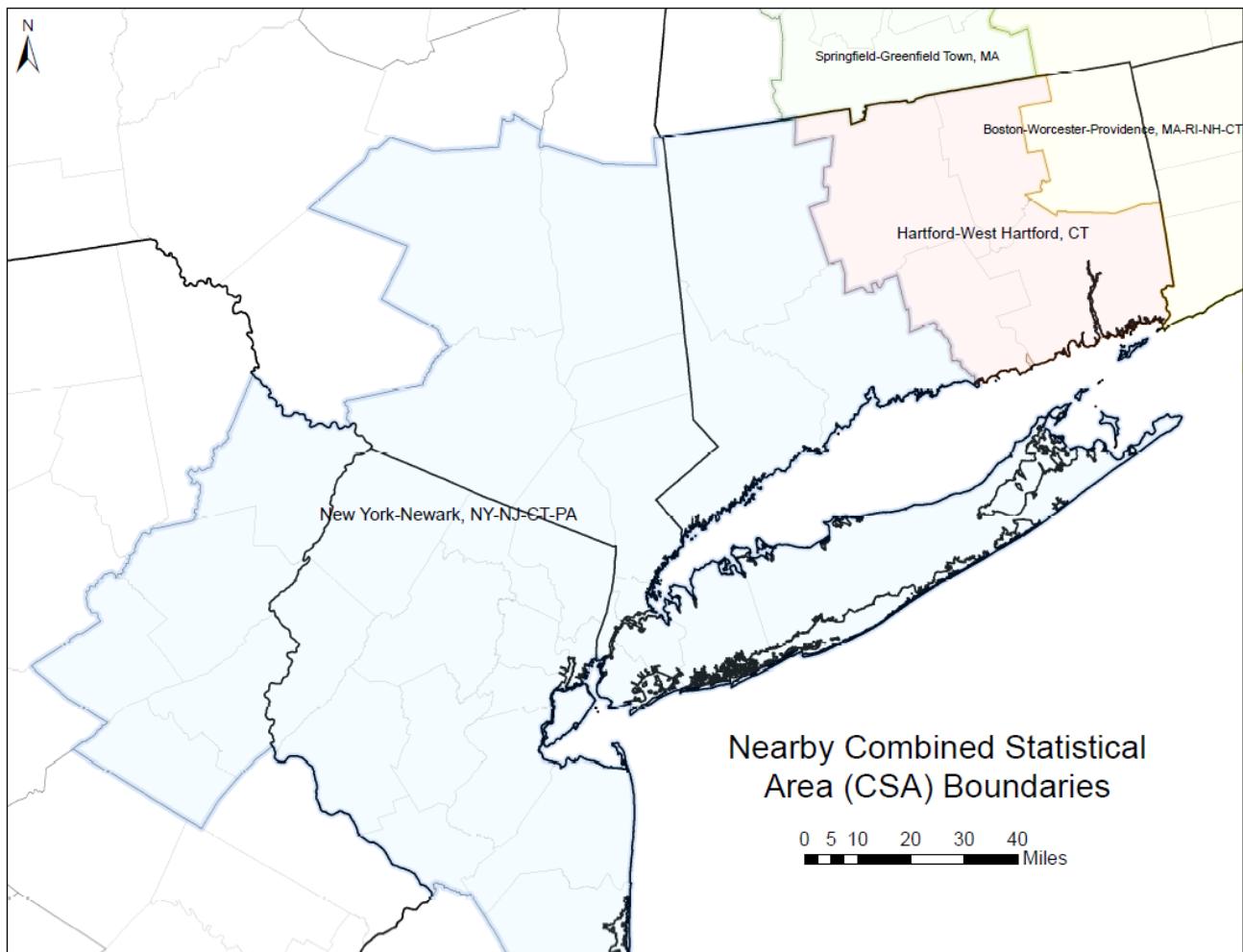
1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 1A is a map showing the boundaries for the CSAs in and around Connecticut. Figure 1B is a map of the EPA's boundary for the Greater Connecticut nonattainment area, which includes Hartford; Litchfield, New London, Tolland, and Windham Counties. The map shows county boundaries, and other jurisdictional boundaries. These same five counties were designated nonattainment as the GT CT nonattainment area for purposes of the 1997 ozone NAAQS and for purposes of the 2008 ozone NAAQS.

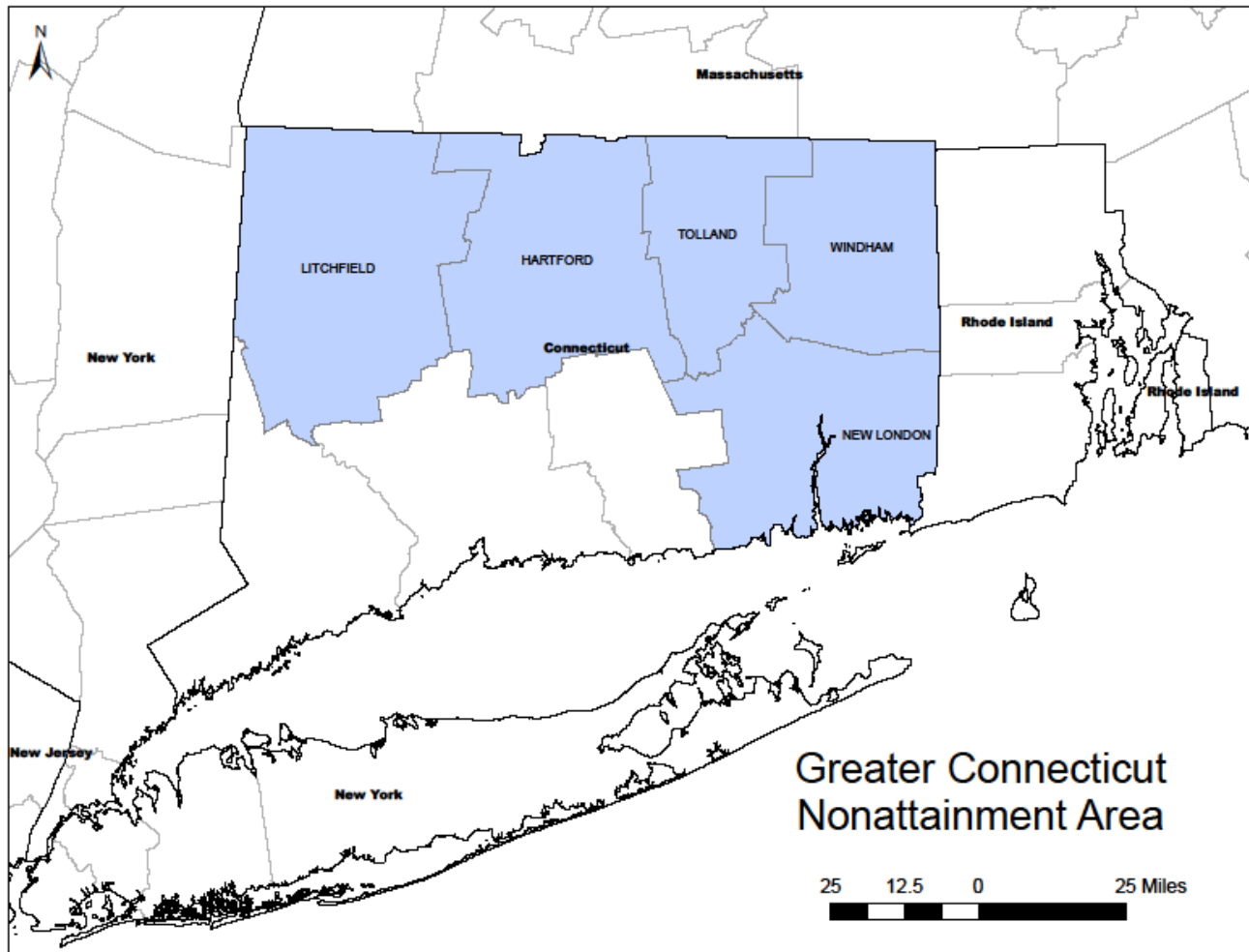
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<sup>7</sup> The EPA's Ozone Designations Guidance and Data web page can be found at: <https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data>

**Figure 1A. Map of Combined Statistical Areas in and Around Connecticut.**



**Figure 1B. EPA's Nonattainment Boundaries for the Greater Connecticut Area.**



The EPA must designate as nonattainment any area that violates the NAAQS, and any nearby areas that contribute to the violation in the violating area.

The following sections describe the five-factor analysis. While the factors are presented individually, they are not independent. The five-factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

## **Factor Assessment**

### **Factor 1: Air Quality Data**

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the area of analysis based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent three-year period with fully-certified air quality data. The design value is the 3-year average of the annual 4<sup>th</sup> highest daily maximum



8-hour average ozone concentration.<sup>8</sup> The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.<sup>9</sup> The EPA uses FRM/FEM measurement data residing in the EPA’s Air Quality System (AQS) database to calculate the ozone design values. Individual violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule<sup>10</sup> are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e. monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58, appendix A, C, D and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for counties in the Greater Connecticut area are shown in Table 2.

**Table 2. Air Quality Data (all values in ppm).**

County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4 <sup>th</sup> highest daily max value	2015 4 <sup>th</sup> highest daily max value	2016 4 <sup>th</sup> highest daily max value
Hartford	Yes	09-003-1003	<b>0.074</b>	0.077	0.075	0.072**
Litchfield	Yes	09-005-0005	<b>0.072</b>	0.068	0.076	0.074**

<sup>8</sup> The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50, appendix U.

<sup>9</sup> The QA requirements for ozone monitoring data are specified in 40 CFR part 58, appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53, subpart B.

<sup>10</sup> The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see <https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance>. Please note that the Connecticut DEEP has requested exceptional event treatment for 3 ozone sites on two days in May 2016 in the Greater Connecticut area.



County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4 <sup>th</sup> highest daily max value	2015 4 <sup>th</sup> highest daily max value	2016 4 <sup>th</sup> highest daily max value
New London	Yes	09-011-0124	<b>0.072</b>	0.065	0.077	0.075
Tolland	Yes	09-013-1001	<b>0.073</b>	0.077	0.072	0.072
Windham	Yes	09-015-9991	0.068	0.067	0.070	0.067**

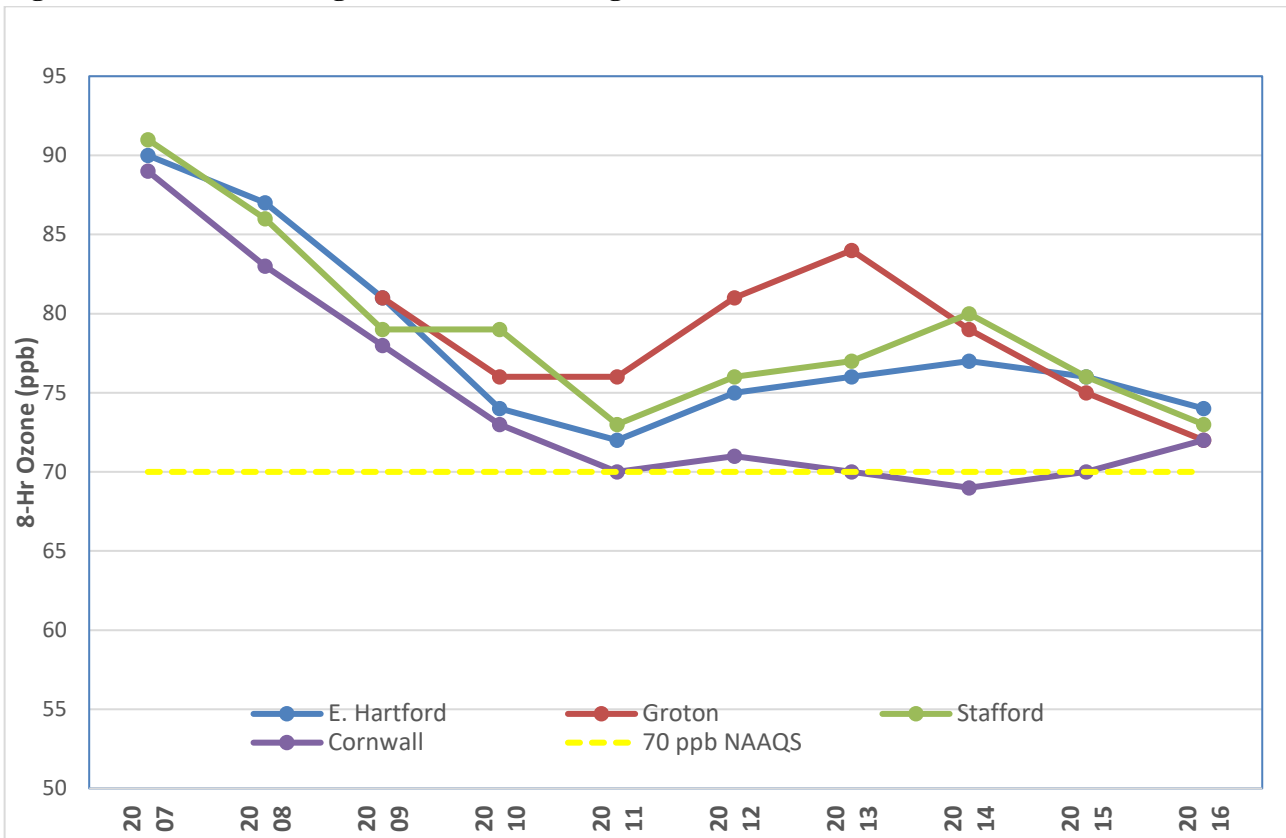
\*\*Exceptional Events were concurred on by EPA.

The highest design value is indicated in bold.

Hartford, Litchfield, New London, and Tolland Counties show a violation of the 2015 ozone NAAQS, therefore these counties are included in the nonattainment area.

Table 2 identifies the design values for all monitors in Hartford, Litchfield, New London, Tolland and Windham Counties and Figure 2 shows the historical trend of design values for the monitors in that same area. As shown in Table 2, there are four violating monitors that are located in this area, the monitor in Windham County meets the NAAQS. As shown in Figure 2, this area's ozone air quality continues to improve, except there was a small increase in 2016 design value for the Cornwall monitor.

**Figure 2. Three-Year Design Values for Violating Monitors in the Greater Connecticut Area (2007-2016).**



Note: The East Hartford Monitor is in Hartford County, the Groton Monitor is in New London County, the Stafford Monitor is in Tolland County, and the Cornwall Monitor is in Litchfield County.

## Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

### Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO<sub>x</sub> or VOC emissions greater than 100 tons per year) and small point sources and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 3 provides a county-level emissions summary of NO<sub>x</sub> and VOC (given in tons per year (tpy)) emissions for Hartford, Litchfield, New London, Tolland and Windham Counties.

**Table 3. Total County-Level NO<sub>x</sub> and VOC Emissions.**

County	State Recommended Nonattainment?	NO <sub>x</sub> (tpy)	VOC (tpy)
Hartford	Yes	13,882	18,961
Litchfield	Yes	2,608	5,693
New London	Yes	6,243	7,636
Tolland	Yes	2,138	3,381
Windham	Yes	1,962	3,222
Area wide:		26,833	38,893

In addition to reviewing county-wide emissions of NO<sub>x</sub> and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown in Figure 3 below.

**Figure 3. Large Point Sources in and near Connecticut.**

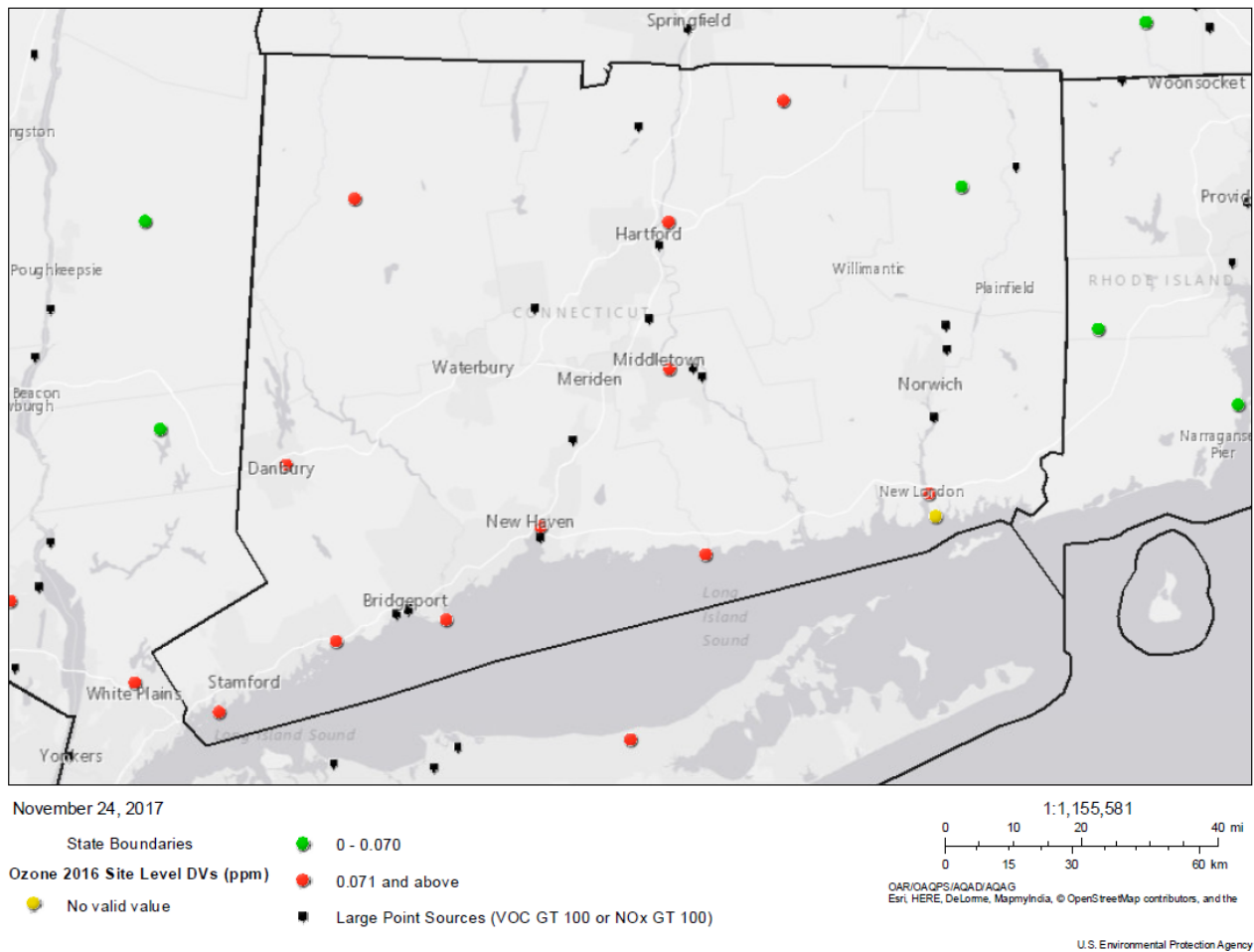


Figure 3 shows the large point sources of ozone precursors and design values in and near Connecticut.

**Population density and degree of urbanization**

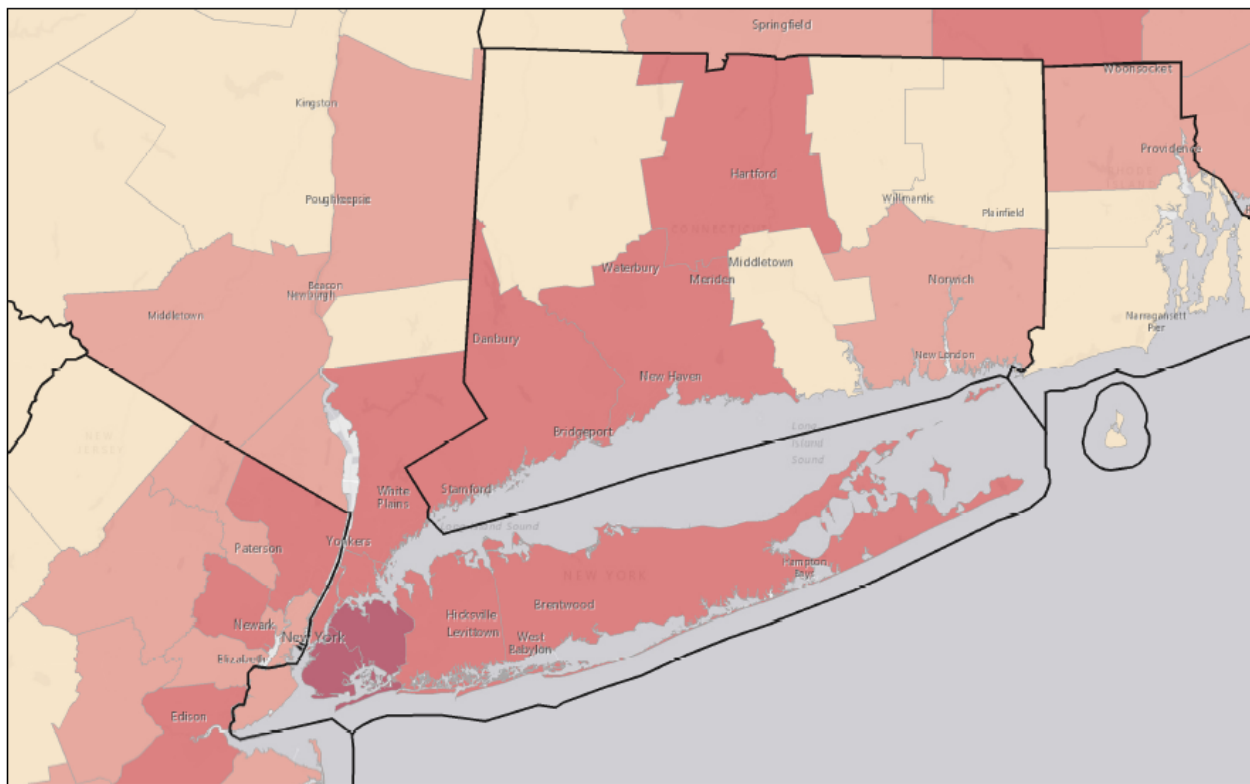
In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO<sub>x</sub> and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO<sub>x</sub> and VOC emissions that may contribute to violations of the NAAQS. Table 4 shows the population, population density, and population change information Hartford, Litchfield, New London, Tolland and Windham Counties. The population of the entire nonattainment area is 1,619,300, with a total area of over 3200 Sq. Miles. Over half the population, of the nonattainment area, lives in Hartford County. Figure 4 shows the county-level population density.

**Table 4. Population and Growth.**

County	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute change in population (2010-2015)	Population % change (2010-2015)
Hartford	Yes	894,014	895,841	1218.7	1827	+0.2
Litchfield	Yes	189,927	183,603	199.4	-6324	-3.3
New London	Yes	274,055	271,863	408.9	-2192	-0.8
Tolland	Yes	152,691	151,420	369	-1271	-0.8
Windham	Yes	118,428	116,573	227.3	-1855	-1.7
Area wide:		1,629,115	1,619,300	499.2	-9,815	-0.6%

Source: U.S. Census Bureau population estimates for 2010 and 2015. <http://www.census.gov/data.html>

**Figure 4. County-Level Population.**



March 29, 2017

State Boundaries  
**USA\_County**  
 0 to 220,000  
 > 220,000 to 744,344  
 > 744,344 to 2,035,210  
 > 2,035,210 to 5,194,675

1:1,646,703  
 0 12.5 25 50 mi  
 0 20 40 80 km  
 Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

U.S. Environmental Protection Agency

## Traffic and Vehicle Miles Travelled

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) Hartford, Litchfield, New London, Tolland and Windham Counties.

In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis<sup>11</sup>. Table 5 shows the traffic and commuting pattern data, including total VMT, number of residents who work in each county, number of working residents that commute to counties with violating monitor(s), and the percent of residents working in counties with violating monitor(s), for Hartford, Litchfield, New London, Tolland and Windham counties. The data in Table 5 are 2014 data. Counties with a violating monitor are indicated in bold.

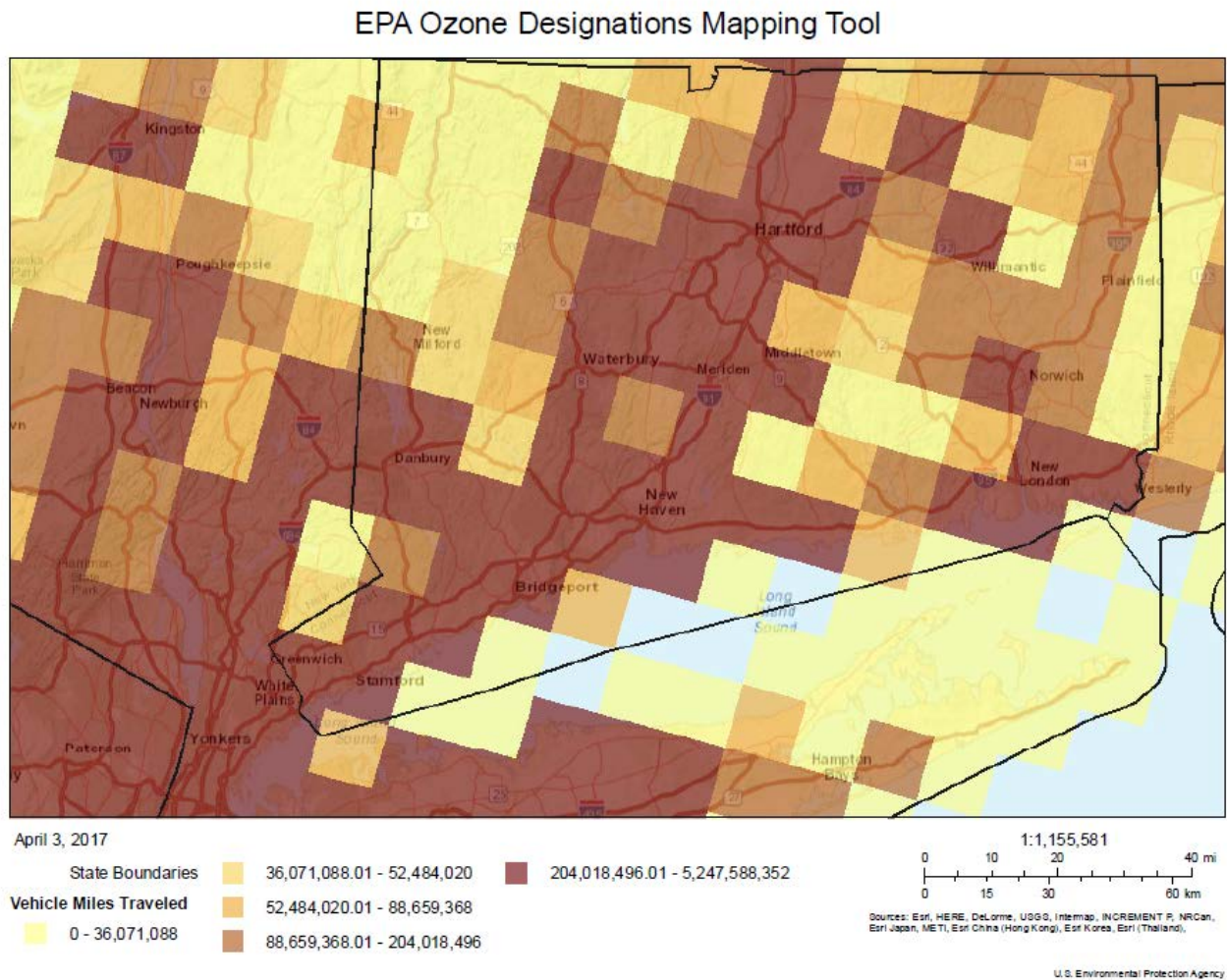
**Table 5. Traffic and Commuting Patterns.**

County	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting to or Within Counties with Violating Monitor(s)	Percentage Commuting to or Within Counties with Violating Monitor(s)
<b>Hartford</b>	<b>Yes</b>	<b>7491</b>	<b>431,629</b>	<b>342,086</b>	<b>79</b>
<b>Litchfield</b>	<b>Yes</b>	<b>1349</b>	<b>96,055</b>	<b>57,371</b>	<b>60</b>
<b>New London</b>	<b>Yes</b>	<b>2747</b>	<b>122,729</b>	<b>94,307</b>	<b>77</b>
<b>Tolland</b>	<b>Yes</b>	<b>1465</b>	<b>70,314</b>	<b>55,430</b>	<b>79</b>
Windham	Yes	979	53,323	17,487	33
Total:		14,031	774,050	566,681	73

Figure 5 shows traffic and commuting patterns using twelve-kilometer gridded VMT from the 2014 NEI with the transportation arteries for Connecticut and surrounding areas. Figure 5 shows that the majority of traffic in Connecticut is along the I-95 and I-84 corridors.

<sup>11</sup> The worker data can be accessed at: <http://onthemap.ces.census.gov/>.

**Figure 5. Twelve Kilometer Gridded Vehicle Miles Traveled (Miles) Overlaid with Transportation Arteries.**

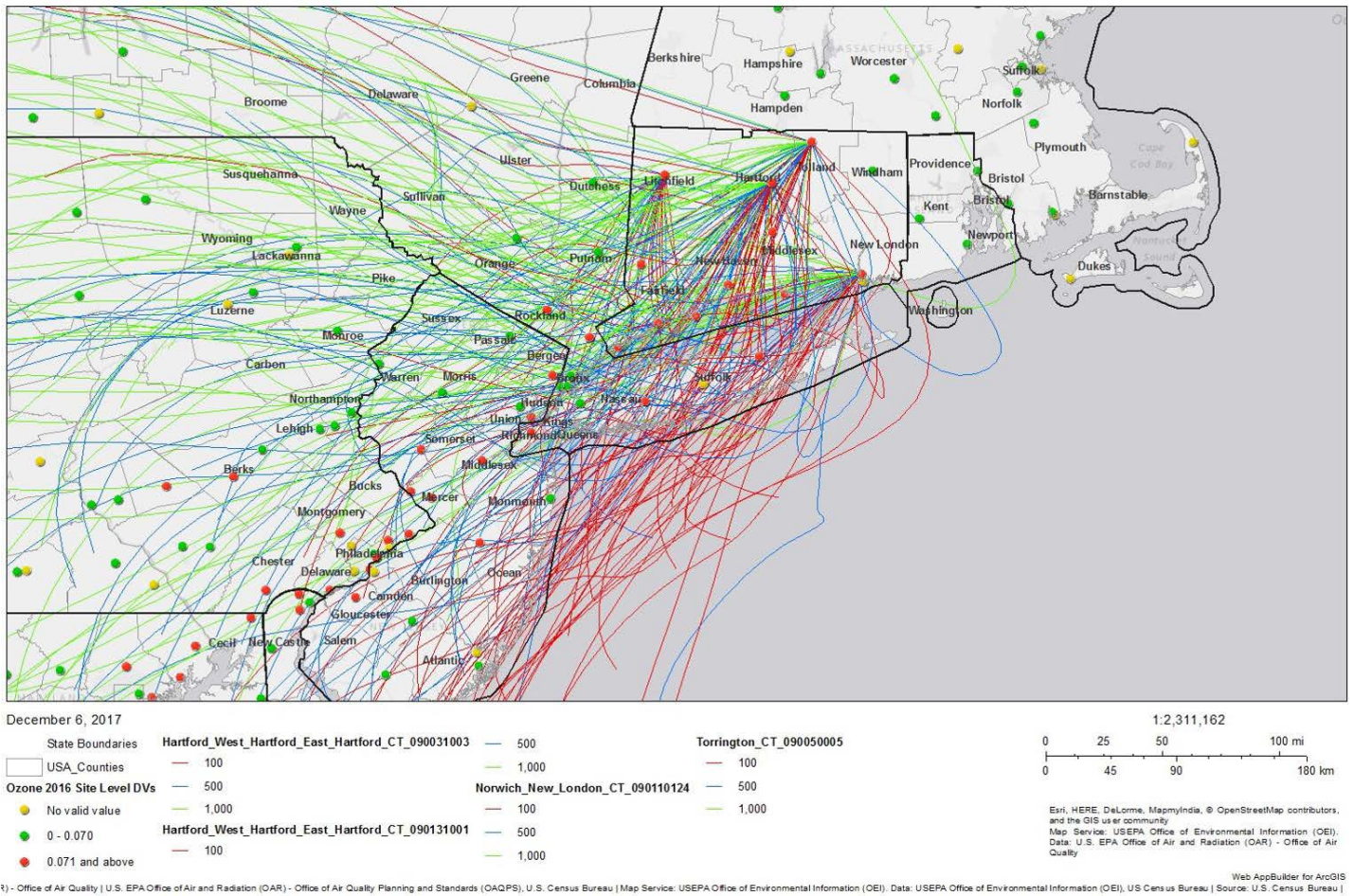


### Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area., the EPA evaluated 2014-2016 HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) trajectories at 100, 500, and 1000 meters above ground level (AGL) that illustrate the path traveled by air parcels to a violating monitor. Figure 6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for the 4 violating monitors in the 5 county area of analysis.



**Figure 6. HYSPLIT Back Trajectories for Violating Monitors in Hartford, Litchfield, New London, and Tolland Counties.**



Note, the trajectories show that the main source region for ozone exceedances in the area originate to the southwest of the area. This adds evidence to support the notion that neither Rhode Island nor Massachusetts should be part of the Greater Connecticut area because HYSPLIT tends to indicate that emissions from Rhode Island and/or Massachusetts are not contributing to the recorded violations at the monitors located in Connecticut. In sum, since only one of the trajectories shown in Figure 6 pass over the county in Rhode Island (Washington), and only three pass over the counties in Massachusetts (Berkshire, Hamden, and Worcester), these counties do not contribute to the nonattainment area.



#### **Factor 4: Geography/topography**

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the air shed. High mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The Greater Connecticut area does not have any geographical or topographical features significantly limiting air pollution transport within its air shed. Therefore, this factor did not play a role in this evaluation.

#### **Factor 5: Jurisdictional boundaries**

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the final Greater Connecticut nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

The Greater Connecticut area has previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. For each of those previous ozone standards, the Greater Connecticut nonattainment area was comprised of Hartford, Litchfield, New London, Tolland and Windham counties in Connecticut. The state has recommended the same boundary for the 2015 ozone NAAQS.

The Greater Connecticut area also includes portions of Indian country. As defined at 18 U.S.C. 1151, “Indian country” refers to: “(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.” The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries. There are two tribes with land in the area of analysis: Mashantucket Pequot Tribal Nation and the Mohegan Tribe. Neither Tribe submitted a designation recommendation. EPA will include these tribal areas as part of the Greater Connecticut nonattainment area.

## **4.0 Conclusion for Greater Connecticut Area**

Based on the assessment of factors described above, EPA has concluded that the following Connecticut counties meet the Clean Air Act criteria for inclusion in the Greater Connecticut nonattainment area: Hartford, Litchfield, New London, Tolland and Windham. Factor 1 is air quality. Four of the five counties have ozone design values that do not meet the 2015 ozone NAAQS. Factor 2 is emissions and emissions related data. All five counties have a combined emission's rate of over 5,000 tons of NO<sub>x</sub> and VOC per year. The third factor is meteorology. Only four of the HYSPLIT trajectories shown in Figure 6 pass over the deferred counties in Massachusetts or Rhode Island. Of these four trajectories, only one passes over Rhode Island and three over Massachusetts, so these counties can be excluded from this area. The fourth factor is Geography/topography. This is not an important factor for Connecticut. The fifth factor is jurisdictional boundaries. It is important to note that these are the same counties that are included in the Greater Connecticut nonattainment area for the 1997 and 2008 ozone NAAQS. This is the most important factor in deciding how to split Connecticut, as requested by the state, into two separate ozone nonattainment areas. All of Connecticut is designated nonattainment for the 2015 ozone NAAQS, including Indian country. The remaining three counties in Connecticut (Fairfield, New Haven, and Middlesex counties) are joined with the multi-state New York-Northern New Jersey-Long Island NY-NJ-CT nonattainment area and are discussed in the TSD for that area.

In sum, after considering Connecticut's recommendation and the five factors discussed above, EPA agrees with Connecticut's recommendation to designate the Greater Connecticut area (which includes Hartford, Litchfield, New London, Tolland and Windham counties) as nonattainment for the 2015 ozone NAAQS.