

Louisiana: Baton Rouge Nonattainment Area

**Intended Area Designations for the
2015 Ozone National Ambient Air Quality Standards
Technical Support Document (TSD)**

1.0 Summary

This technical support document (TSD) describes the EPA's intent to designate the Baton Rouge area in Louisiana as nonattainment for the 2015 ozone National Ambient Air Quality Standards (NAAQS).

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), whenever the EPA establishes a new or revised NAAQS, the EPA must promulgate designations for all areas of the country for that NAAQS. The EPA must complete this process within 2 years of promulgating the NAAQS, unless the Administrator has insufficient information to make the initial designations decisions in that time frame. In such circumstances, the EPA may take up to 1 additional year to complete the designations.

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. Tribes were also invited to submit area designation recommendations. On September 29, 2016, Louisiana ("the State") recommended that the parishes¹ identified in Table 1 (below) be designated as nonattainment for the 2015 ozone NAAQS based on air quality data from 2013-2015.

After considering these recommendations and based on the EPA's technical analysis as described in this TSD, the EPA does not intend to modify the State's recommendation and intends to designate the parishes listed 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. Detailed descriptions of the intended nonattainment boundaries for the area are found in the supporting technical analysis in Section 3 of this TSD.

¹ Parish is the county-equivalent in Louisiana.

Table 1. Louisiana’s Recommended Nonattainment Area and the EPA’s Intended Designated Nonattainment Area for the 2015 Ozone NAAQS

Area	Louisiana’s Recommended Nonattainment Parishes	EPA’s Intended Nonattainment Parishes
Baton Rouge, LA	Ascension Parish East Baton Rouge Parish Iberville Parish Livingston Parish West Baton Rouge Parish	Ascension Parish East Baton Rouge Parish Iberville Parish Livingston Parish West Baton Rouge Parish

In its recommendation letter, the Louisiana Department of Environmental Quality, as designee of the Governor of Louisiana, recommended that the EPA designate as nonattainment five parishes: Ascension, East Baton Rouge, Iberville, Livingston and West Baton Rouge, as identified in the center column of Table 1 above. Also in its recommendation letter, Louisiana recommended that the EPA designate as “unclassifiable/attainment” all other parishes not identified in the center column of Table 1. The EPA does not intend to modify the state’s recommendation as identified in Table 1. On November 6, 2017 (82 FR 54232; November 16, 2017), the EPA signed a final rule designating most of the areas Louisiana did not recommend for designation as nonattainment as attainment/unclassifiable.² EPA explains in section 2.0 the approach it is now taking to designate the remaining areas in the State.

The EPA will designate all tribal lands consistent 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 the National Ambient Air Quality Standards (NAAQS) Designations Process”³ and “Policy for Establishing Separate Air Quality Designations for Areas of Indian Country.”⁴ There are no tribal lands in the area recommended as nonattainment by the State.

2.0 Nonattainment Area Analyses and Intended Boundary Determination

The EPA evaluated and determined the intended 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 intends to designate 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 “ozone designations guidance”⁵ 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

² 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.

³ <https://www.epa.gov/sites/production/files/2016-02/documents/ozone-designation-tribes.pdf>

⁴ <https://www.epa.gov/sites/production/files/2016-02/documents/indian-country-separate-area.pdf>

⁵ The EPA issued guidance on February 25, 2016 that identified important factors that the EPA intends to 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>

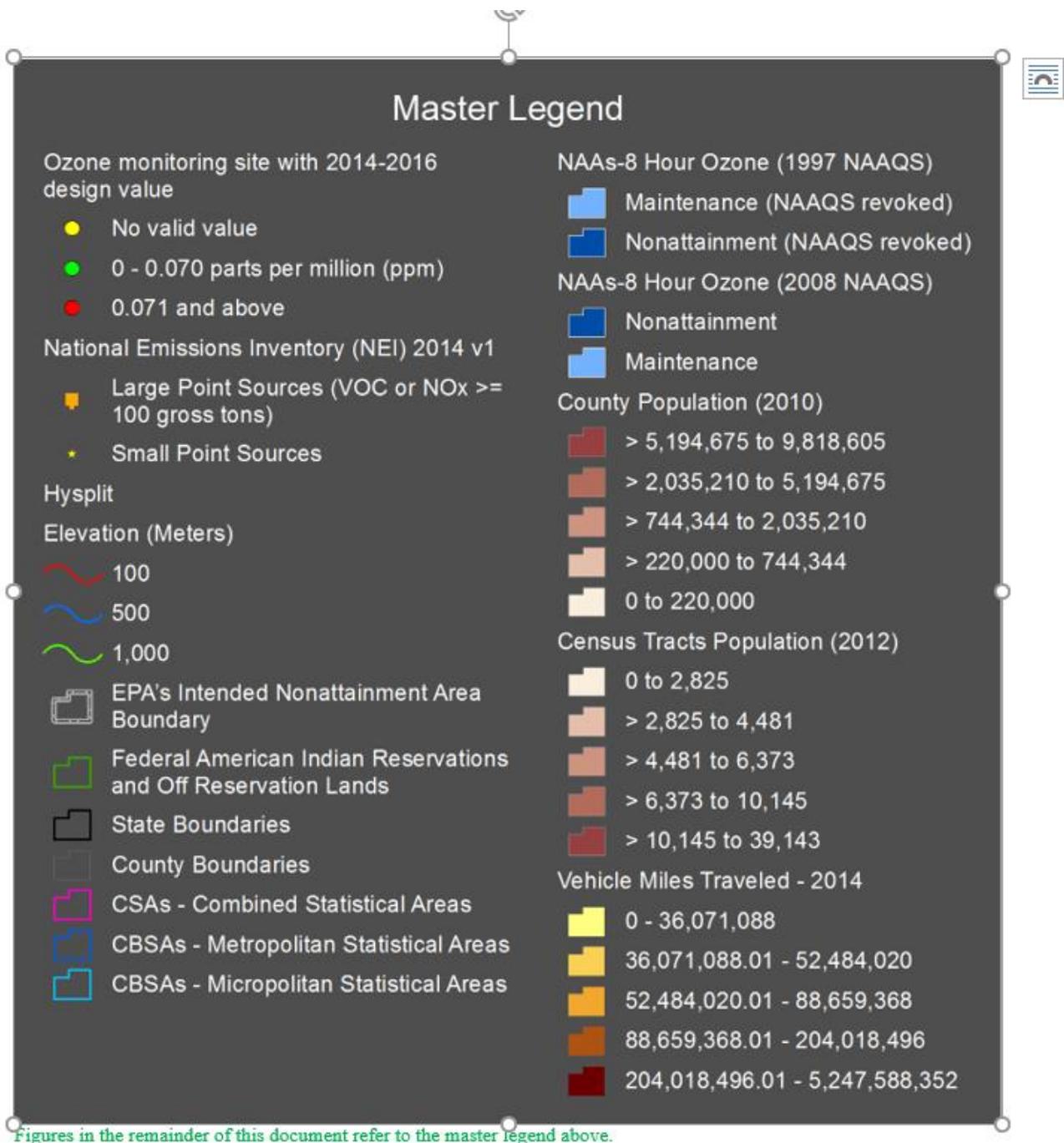
Combined Statistical Area (CSA)⁶ as a starting point for the contribution analysis is a reasonable approach to ensure that the nearby areas most likely to contribute to a violating area are evaluated. The area-specific analyses may support nonattainment boundaries that are smaller or larger than the 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.⁷ 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 is proceeding to complete 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 intend to designate 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 "Intended Designations for Deferred Counties and Partial Counties Not Addressed in the Technical Analyses." which is available in the docket.

⁶ Lists of CBSAs and CSAs and their geographic components are provided at 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.

⁷ Air Quality Designations for the 2015 Ozone National Ambient Air Quality Standards published on November 16, 2017(82 FR 54232).



3.0 Technical Analysis for the Baton Rouge Area

This technical analysis identifies the areas with monitors that violate the 2015 ozone NAAQS. It also provides the EPA's evaluation of this area and any nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitors in the 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 latest 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).⁸ In addition, the EPA considered any additional data or information provided to the EPA by states or tribes.

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

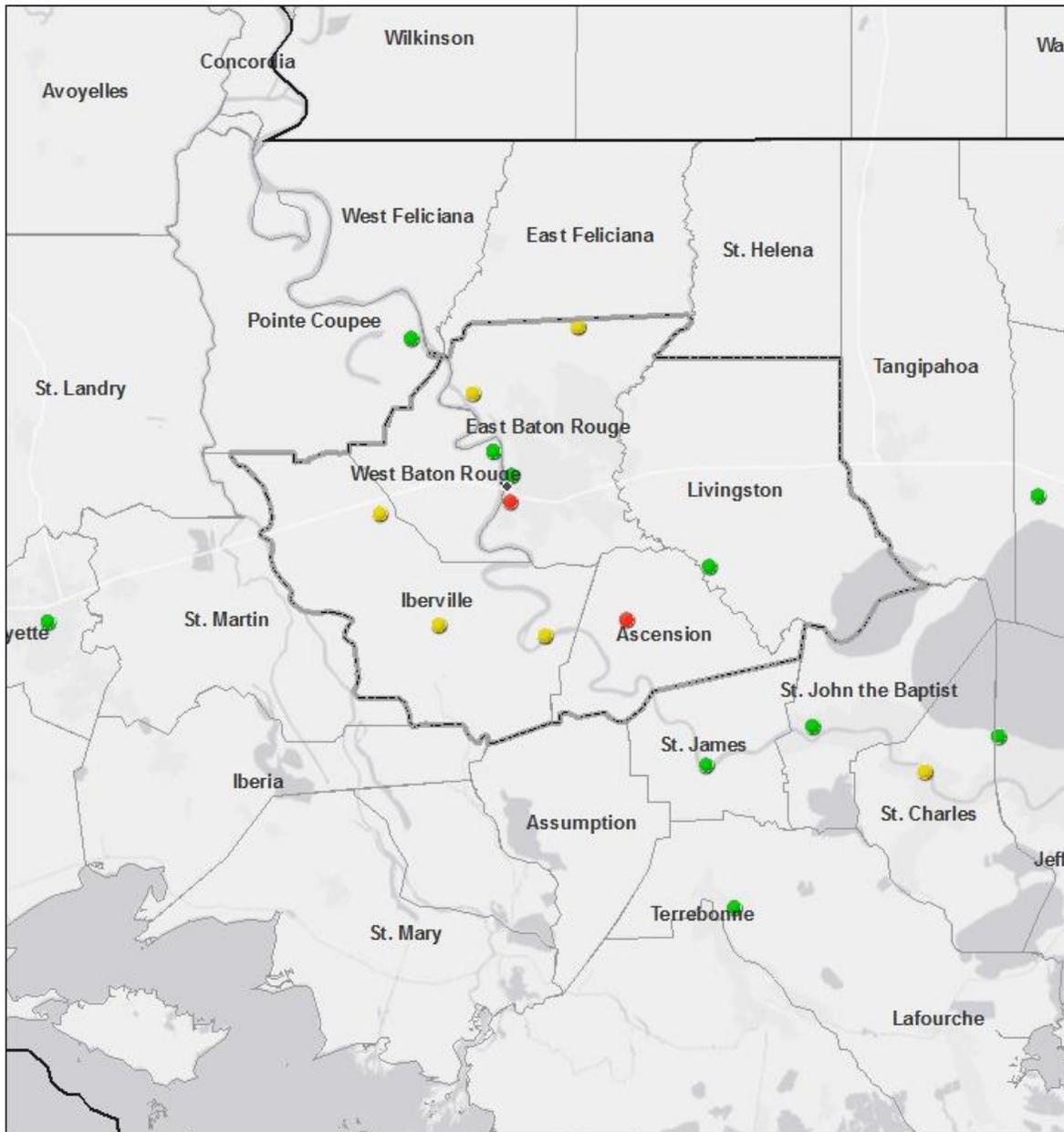
1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport 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)).

The CBSA is identified as Baton Rouge, LA and includes 9 parishes: Ascension, East Baton Rouge, East Feliciana, Iberville, Livingston, Pointe Coupee, St. Helena, West Baton Rouge, and West Feliciana. There is not a CSA that includes any of the parishes in the Baton Rouge CBSA. The CBSA is shown in Figure 1 below and we refer to these 9 parishes as the area of analysis. Figure 1 also shows the EPA's intended nonattainment boundary, the ambient air quality monitors, parish and other jurisdictional boundaries, and the nonattainment boundary for the 2008 ozone NAAQS. For purposes of the 1997 and 2008 ozone NAAQS, five parishes within the area of analysis were designated as nonattainment: Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge.⁹

⁸ 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>.

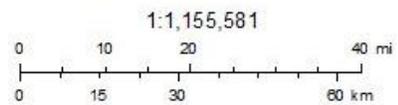
⁹ The five-parish nonattainment area is meeting the 1997 and 2008 ozone NAAQS and has been redesignated as attainment for both of those ozone NAAQS (see 76 FR 74000, November 30, 2011 and 81 FR 95051, December 27, 2016).

Figure 1. EPA's Intended Nonattainment Boundaries for the Area of Analysis



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- State Boundaries
- USA_Counties
- Baton Rouge NAA
- Ozone 2016 Site Level DVs
 - 0 - 0.070
 - 0.071 and above
 - No valid value



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 Map Service: USEPA Office of Environmental Information (OEI). Data: U.S. EPA Office of Air and Radiation (OAR) - Office of Air Quality

The EPA must designate as nonattainment any area (in this case, parish) whose monitor(s) violate(s) the NAAQS and any nearby areas that contribute to such violation(s). Ascension and East Baton Rouge parishes have a monitor in violation of the 2015 ozone NAAQS, therefore these parishes are included in the intended nonattainment area. The EPA determined that Iberville, Livingston and West Baton Rouge parishes contribute to the violating monitors. The following sections describe the weight of evidence 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). This is the most recent three-year period with fully-certified air quality data. The design value (DV) is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.¹⁰ The 2015 ozone NAAQS is met when the DV 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.¹¹ The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone DVs. 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 Rule¹² are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the DV for the county or area is determined by the monitor with the highest valid DV. The presence of one or more violating monitors (i.e. monitors with DVs 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 DVs violate the ozone NAAQS, and examined historical ozone air quality measurement data (including previous DVs) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing DV 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). Modeling and information from non-regulatory monitors (e.g., non-FRM/FEM) may not be used to

¹⁰ 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.

¹¹ 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.

¹² 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>.

determine a violation, but may be used in boundary determinations. There are currently no SPMs in the area of analysis.

The 2014-2016 design values for parishes in the area of analysis are shown in Table 2 below.

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

Parish	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4 th highest daily max value	2015 4 th highest daily max value	2016 4 th highest daily max value
Ascension	Yes	220050004 "Dutchtown"	0.071	0.069	0.074	0.071
East Baton Rouge	Yes	220330003 "LSU"	0.072	0.075	0.073	0.068
		220330009	0.066	0.070	0.069	0.061
		220330013	N/A	0.068	0.062	N/A
East Feliciana	No	No monitor	N/A			
Iberville	Yes	220470009	N/A	0.061	0.069	0.064
		220470012 "Carville"	N/A	0.068	0.075	N/A
Livingston	Yes	220630002	0.070	0.073	0.070	0.067
Pointe Coupee	No	220770001	0.068	0.071	0.069	0.065
St. Helena	No	No monitor	N/A			
West Baton Rouge	Yes	221210001	0.066	0.066	0.066	0.066
West Feliciana	No	No monitor	N/A			

* The highest design value in each parish with a violating monitor is indicated in bold type.

N/A means that the monitor did not meet the completeness criteria described in 40 CFR, part 50, Appendix U, or no data exists for the parish.

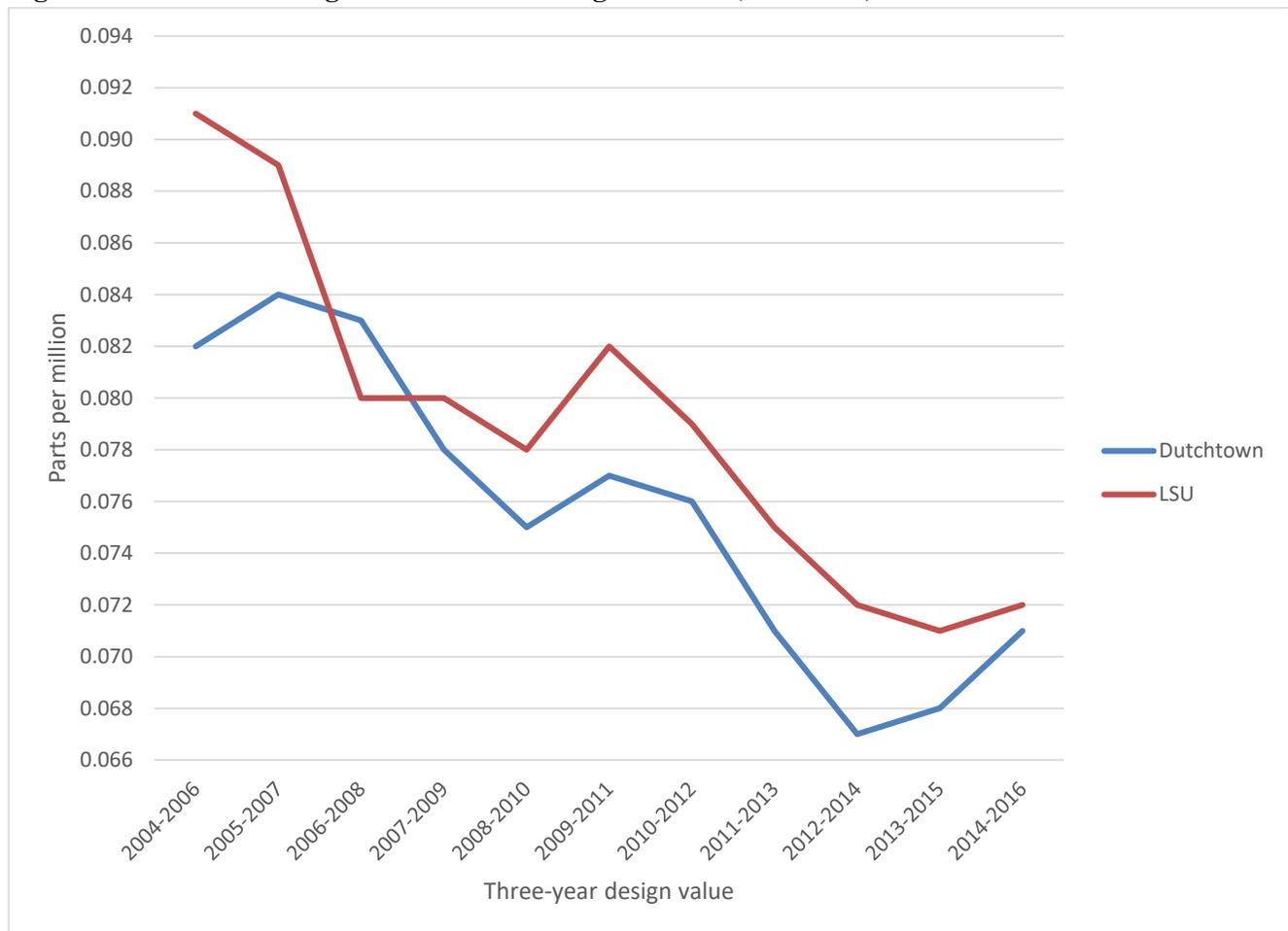
Ascension and East Baton Rouge parishes each have a monitor that shows a violation of the 2015 ozone NAAQS, therefore these parishes are included in the intended nonattainment area. A parish must also be designated nonattainment if it contributes to a violation in a nearby area. Each parish in the area of analysis has been evaluated, as discussed below, based on the five factors and other relevant information to determine whether it contributes to the nearby violation. EPA also notes that, in addition to the violating monitors in Ascension and East Baton Rouge Parishes, three other parishes have one or more monitors that are meeting the ozone NAAQS. Within the area of analysis, Assumption, East Feliciana, Iberia, St. Helena, and West Feliciana parishes do not have ozone monitoring sites.

Figure 1, shown previously, identifies the intended nonattainment area, the CBSA boundary and the violating monitors. Table 2 identifies the design values for all monitors in the area of analysis and Figure 2 below shows the historical trend of design values for the violating monitors. As indicated in Table 2, there are a total of nine monitors in the area of analysis and two are in violation of the 2015 ozone standard. The violating monitors are located in Ascension and East Baton Rouge parishes. The Ascension Parish monitor (the "Dutchtown" monitor) has an ozone DV of 71 parts per billion (ppb) and is located in a rural area west of Interstate 10 (I-10) and nearly 3 miles west of Gonzales. The three East Baton Rouge Parish monitors are located east of the Mississippi River. The monitor located at the northern edge of the Louisiana State University grounds (the "LSU" monitor) has an ozone DV of 72 ppb and is a violating monitor. A second monitor, which is attaining with a DV of 66 ppb, is located nearly 3 miles further north of the LSU monitor in a less populated area, but close to several State

agency buildings, a rail yard, and I-10. The third monitor, which has incomplete data for the 2014-2016 period, is located approximately 19.5 miles north-northeast of the city of Baton Rouge, in a rural area. The two Iberville Parish monitors, which have incomplete data for the 2014-2016 period, are located in rural areas approximately 2 miles west of Carville; and about 2.5 miles south of Indian Village. The Livingston Parish monitor is attaining at the level of the standard with an ozone DV of 70 ppb; it is located in a rural area, between the cities of Port Vincent and French Settlement. The West Baton Rouge Parish monitor, which is attaining with a DV of 66 ppb, is located in a less populated area, approximately 4.5 miles north-northwest of the I-10/110 intersection and less than a mile west of the Mississippi River. Lastly, the monitor in Pointe Coupee Parish, which is attaining, is located close to the eastern-most edge of the parish boundary, about a mile west of the Mississippi River and border with West Feliciana Parish.

Figure 2 below illustrates the trend in ozone design values since 2006 at the monitors in the area of analysis currently violating the 2015 ozone standard. The LSU monitor has had the highest DV nearly every year since 2006. The overall trend is relatively consistent for all violating monitors in this area and reflects generally steadily decreasing ozone levels, with the design value monitor (LSU) decreasing by an average of 1.9 ppb per year. We note that there has been an uptick in the DV for the last two DV periods.

Figure 2. Three-Year Design Values for Violating Monitors (2006-2016)



EPA intends to designate as nonattainment the areas with the monitors that are violating the 2015 ozone NAAQS: Ascension and East Baton Rouge Parishes are included in EPA’s intended nonattainment area for the 2015 ozone NAAQS.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NOx) 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 parish in the area of analysis, the EPA examined the magnitude of large sources - NOx or VOC emissions greater than 100 tons per year (tpy) 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.¹³ Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations. Table 3 below provides a county-level emissions summary of NOx and VOC emissions (in tpy) within the area of analysis.

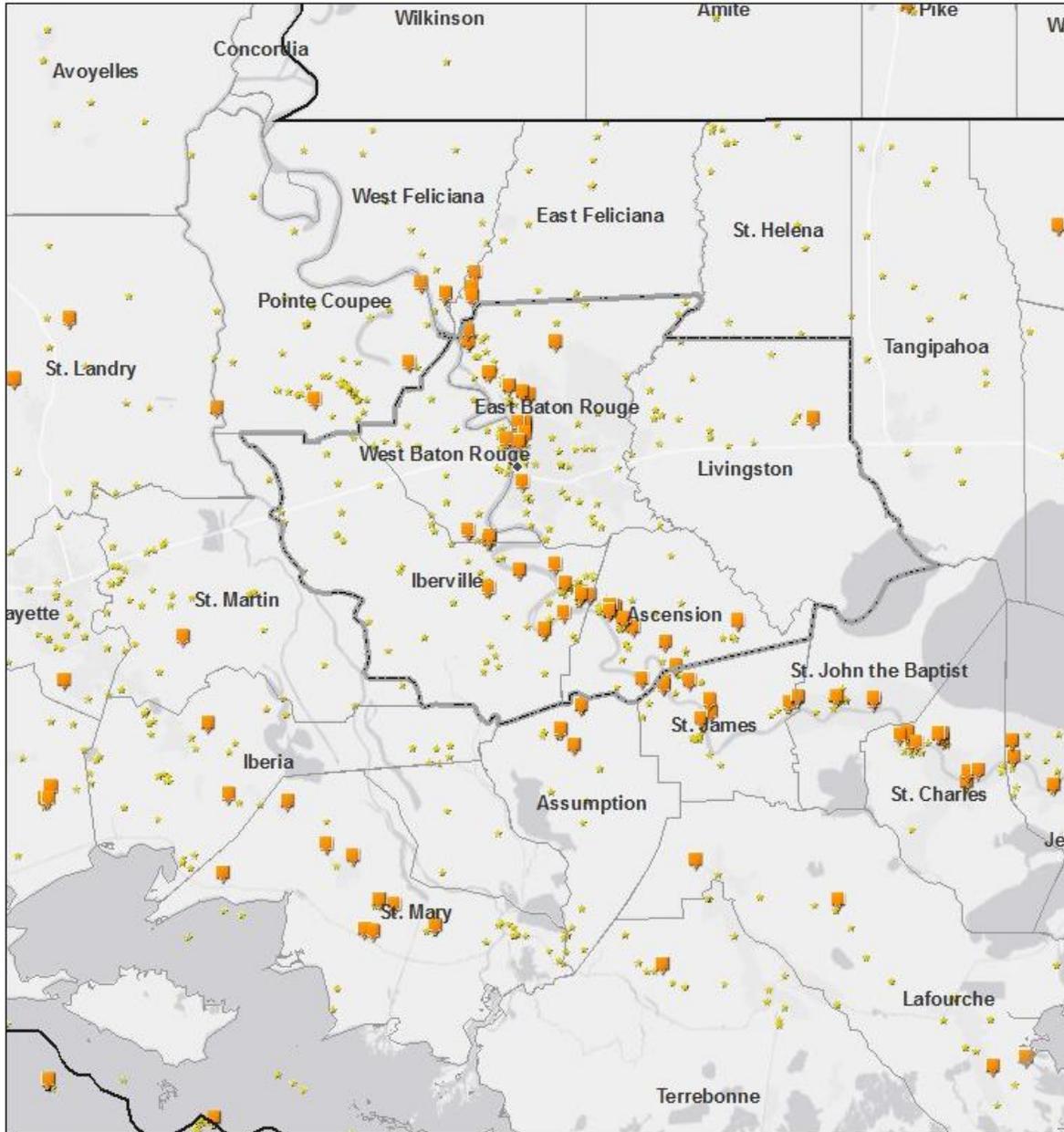
Table 3. Total County-Level NOx and VOC Emissions.

Parish	State Recommended Nonattainment?	Total NOx (tpy)	Total VOC (tpy)
East Baton Rouge	Yes	18,645	15,848
Pointe Coupee	No	10,847	3,233
Ascension	Yes	10,786	6,062
Iberville	Yes	10,163	4,749
Livingston	Yes	3,282	4,074
West Baton Rouge	Yes	3,093	2,505
West Feliciana	No	949	1,898
East Feliciana	No	873	1,459
St. Helena	No	428	832
Area wide:		59,066	40,659

Our review of emissions of NOx and VOC in the area of analysis includes emissions from large and small point sources. The location of these sources, together with the other four factors listed on page 3 above, can help define the nonattainment boundaries. The locations of the large and small point sources are shown in Figure 3 below.

¹³ Biogenic emissions are excluded from our emissions data here.

Figure 3. Large and Small Point Sources in the Area of Analysis



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- State Boundaries
- USA_Countries
- Baton Rouge NAA
- Large Point Sources (VOC GT 100 or NOx GT 100)
- Small Point Sources

0 10 20 40 mi
0 15 30 60 km

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Map Service: USEPA Office of Environmental Information (OEI) | Data: USEPA Office of Environmental Information (OEI), US Census Bureau | Source: U.S. Census Bureau | Esri, HERE, Garmin, NGA, USGS, NPS | Web App Builder for ArcGIS

Figure 3 shows that many of the large point sources are located along the Mississippi River, with the heaviest concentrations in East Baton Rouge, Iberville and Ascension Parishes. Many of the small point sources are also located along the Mississippi, but also appear throughout the area of analysis. Four parishes in the area of analysis are characterized by comparatively high emissions of NO_x, which exceed 10,000 tpy: East Baton

Rouge, Pointe Coupee, Ascension, and Iberville. In addition, two parishes in the area of analysis have VOC emissions in excess of 5,000 tpy: East Baton Rouge (greater than 15,000 tpy), and Ascension (greater than 6,000 tpy). The remaining parishes are characterized by comparatively lower emissions, in the range of 400 to 3,300 tpy of NOx and 800 to 4,700 tpy VOC.

Population density and degree of urbanization

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 NOx 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 NOx and VOC emissions that may contribute to violations of the NAAQS. Table 4 below shows population, population density, and population growth for each parish in the area of analysis.

Table 4. Population and Growth

Parish	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute change in population (2010-2015)	Population % change (2010-2015)
East Baton Rouge	Yes	440,171	446,753	981	6,582	1
Livingston	Yes	128,026	137,788	213	9,762	8
Ascension	Yes	107,215	119,455	412	12,240	11
Iberville	Yes	33,387	33,095	53	-292	-1
West Baton Rouge	Yes	23,788	25,490	132	1,702	7
Pointe Coupee	No	22,802	22,251	40	-551	-2
East Feliciana	No	20,267	19,696	43	-571	-3
West Feliciana	No	15,625	15,385	38	-240	-2
St. Helena	No	11,203	10,567	26	-636	-6
Area wide:		802,484	830,480	206	27,996	4

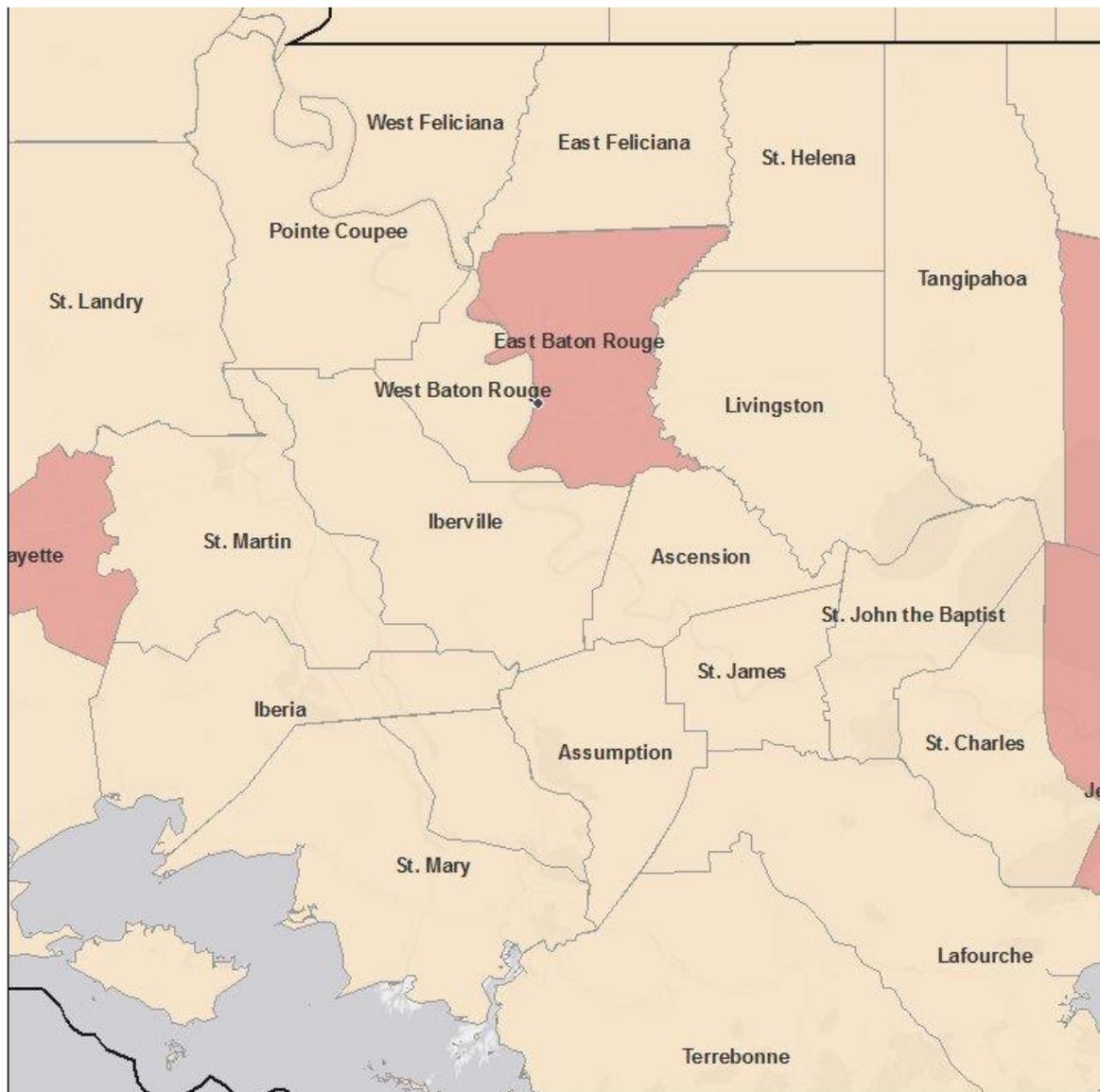
Source: U.S. Census Bureau population estimates for 2010 and 2015. www.census.gov/data.html.

The 2015 Census data indicate that the majority of the population within the area of analysis resides in the parishes of Ascension, East Baton Rouge, and Livingston - each of these parishes is characterized by population counts in excess of 100,000 people and population densities greater than 200 people per square mile.

From 2010 to 2015, Ascension Parish experienced the highest absolute and percentage population change with an increase in population of over 12,000, which is approximately an 11 percent change. Livingston experienced growth of over 9,700, a change of approximately 8%. West Baton Rouge, which has a relatively small population of about 25,000, experienced a relatively high growth rate of 7 percent. In contrast, East Baton Rouge, which has the largest total population in the area had a more modest growth of 1 percent. The remaining parishes in the area of analysis experienced negative population growth from 2010 to 2015.

The presence of large populations and high population density is an indicator of high area and mobile source emissions of ozone precursors that may contribute to observed violations of the 2015 ozone NAAQS in this area, which supports inclusion of these parishes in the nonattainment area. The remaining parishes are mostly rural with little urbanization. Figure 4 below shows the parish-level population density in the area of analysis.

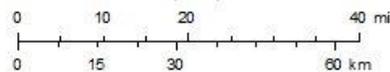
Figure 4. Parish-Level Population



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- State Boundaries
- USA_Counties
- USA_Counties
- 0 to 220,000
- > 220,000 to 744,344



OAR/OAQPS/AQA/D/AQAG
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Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each parish in the area of analysis.¹⁴ 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 parish with high VMT and/or high number of commuters is generally an integral part of an urban area. 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 parish 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 Bureau¹⁵ for the parishes in the area of analysis. Table 5 below shows the traffic and commuting pattern data, including total VMT for each parish, number of residents who work in each parish, number commuting in or to parishes with violating monitors, and the percent of residents commuting in or to parishes with violating monitors. Unless otherwise noted, the data in Table 5 are 2014 data.

Table 5. Traffic and Commuting Patterns

Parish	State Recommended Nonattainment?	2008 Total VMT (Million Miles)	2014 Total VMT (Million Miles)	VMT Growth 2008 to 2014 (percent)	Number of Parish Residents Who Work	Number Commuting to or Within Parishes with Violating Monitor(s)	Percentage Commuting to or Within Parishes with Violating Monitor(s)
East Baton Rouge	Yes	3,572	4,156	16%	189,756	142,854	75%
Livingston	Yes	1,287	1,342	4%	56,262	28,793	51%
Ascension	Yes	1,141	1,250	10%	49,308	34,067	69%
West Baton Rouge	Yes	596	693	16%	11,984	5,911	49%
Iberville	Yes	516	488	-5%	13,503	5,470	41%
Pointe Coupee	No	289	289	0	10,016	3,574	36%
East Feliciana	No	225	189	-16%	8,535	4,005	47%
West Feliciana	No	160	126	-21%	5,192	1,817	35%
St. Helena	No	136	100	-26%	4,856	1,196	25%
Total		7,922	8,633	9%	349,412	227,687	65%

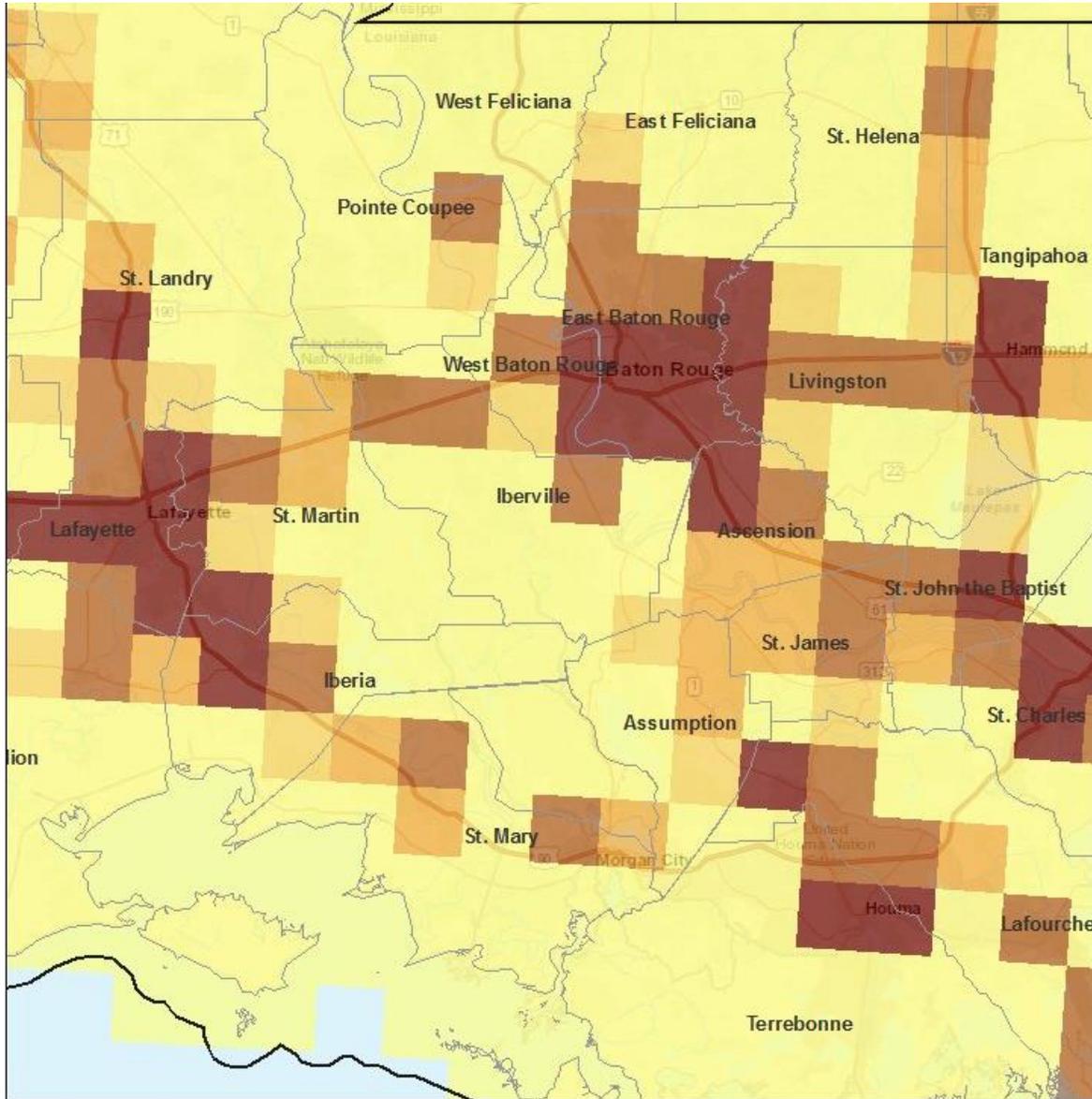
¹⁴ The VMT data are available from the NEI (see <https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei>). See also <https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data>.

¹⁵ The worker data can be accessed at: <http://onthemap.ces.census.gov/>.

Parishes with a monitor violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 5 below overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

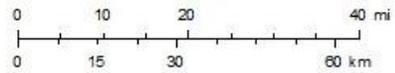
Figure 5. Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries



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State Boundaries		36,071,088.01 - 52,484,020
USA_Counties		52,484,020.01 - 88,659,368
Vehicle Miles Traveled		88,659,368.01 - 204,018,496
		204,018,496.01 - 5,247,588,352
		0 - 36,071,088



Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, OpenStreetMap contributors, and the GIS User Community
 U.S. EPA Office of Air and Radiation (OAR) - Office of Air Quality Planning

Web AppBuilder for ArcGIS

Map Service: USEPA Office of Environmental Information (OEI) | Data: USEPA Office of Environmental Information (OEI), US Census Bureau | Source: U.S. Census Bureau | Esri, HERE, Garmin, NGA, USGS, NPS |

Commuters in the area of analysis traveled a total of approximately 8.6 billion miles during calendar year 2014. Three parishes in the area of analysis (East Baton Rouge, Livingston, and Ascension) each have total VMT for calendar year 2014 in excess of 1 billion miles. East Baton Rouge Parish has the highest total VMT with approximately 4 billion miles, while Livingston and Ascension are comparatively even with 1.3 and 1.2 billion miles, respectively. West Baton Rouge Parish has nearly 700 million VMT, Iberville Parish has nearly 500 million miles, and the remaining 4 parishes in the area of analysis have less than 300 million miles.

Four of the nine parishes in the area of analysis experienced an increase in VMT for the period from 2008 – 2014.¹⁶ In three of those parishes, the growth rate was 10 percent or more: East Baton Rouge (+16%), West Baton Rouge (+16%), and Ascension Parish (+10%). Livingston Parish had approximately 4 percent growth in VMT. Pointe Coupee Parish had approximately zero growth in VMT, and the remaining four parishes declined in VMT growth, ranging from approximately (-5%) to (-26%).

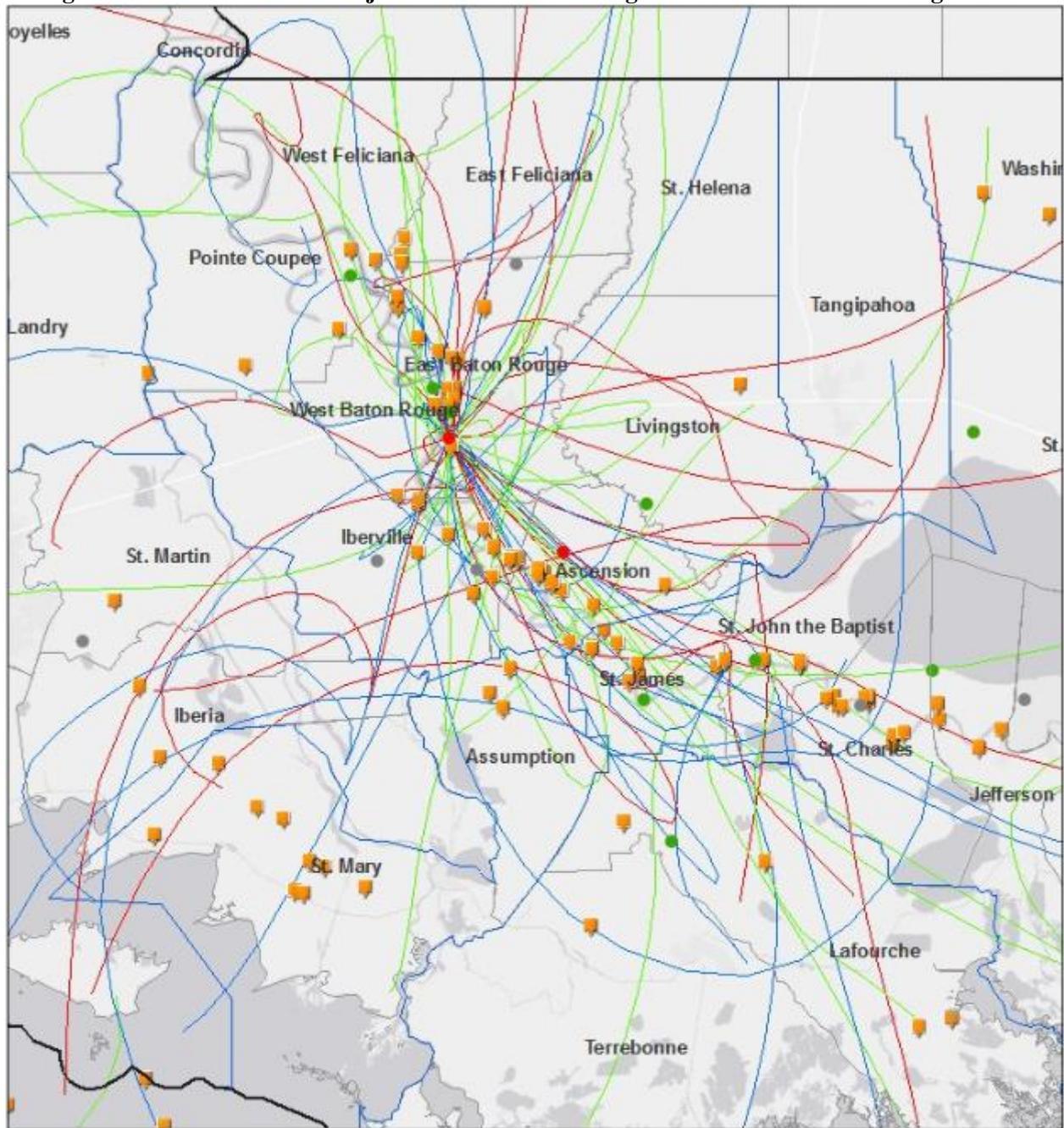
The two parishes in the area of analysis with the highest percentage of commuters to or within parishes with violating monitors are the two parishes with the violating monitors: East Baton Rouge (75%) and Ascension (69%). Three more parishes have close to 50% of their workers commuting to or within counties with the violating monitors: Livingston (51%), West Baton Rouge (49%), and East Feliciana (47%). For Iberville, Pointe Coupee, West Feliciana, and St. Helena parishes, approximately 25% to 41% of their workers commute to the parishes with violating monitors.

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. EPA conducted analyses to better understand the area's meteorological transport conditions using the National Oceanic and Atmospheric Administration Hybrid Single Particle Lagrangian Integrated Trajectory Model (NOAA HYSPLIT or HYSPLIT). The HYSPLIT model yields an estimate of the path an air mass has traveled before reaching a monitor at a specific location and time. Specifically, the model provides the centerline of the probable path. By evaluating these estimates of where an air mass has traveled before reaching a monitor where an exceedance has occurred, one can consider what potential areas and emission sources could have contributed to the exceedance. The EPA evaluated 2014-2016 HYSPLIT trajectories at 100, 500 and 1,000 meters above ground level (AGL) that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figures 6a and 6b show 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 violating monitors.

¹⁶ To calculate VMT growth we compared VMT from the 2008 and 2014 NEIs.

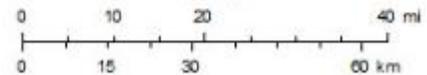
Figure 6a. HYSPLIT Back Trajectories for the Violating Monitor in East Baton Rouge Parish



July 18, 2017

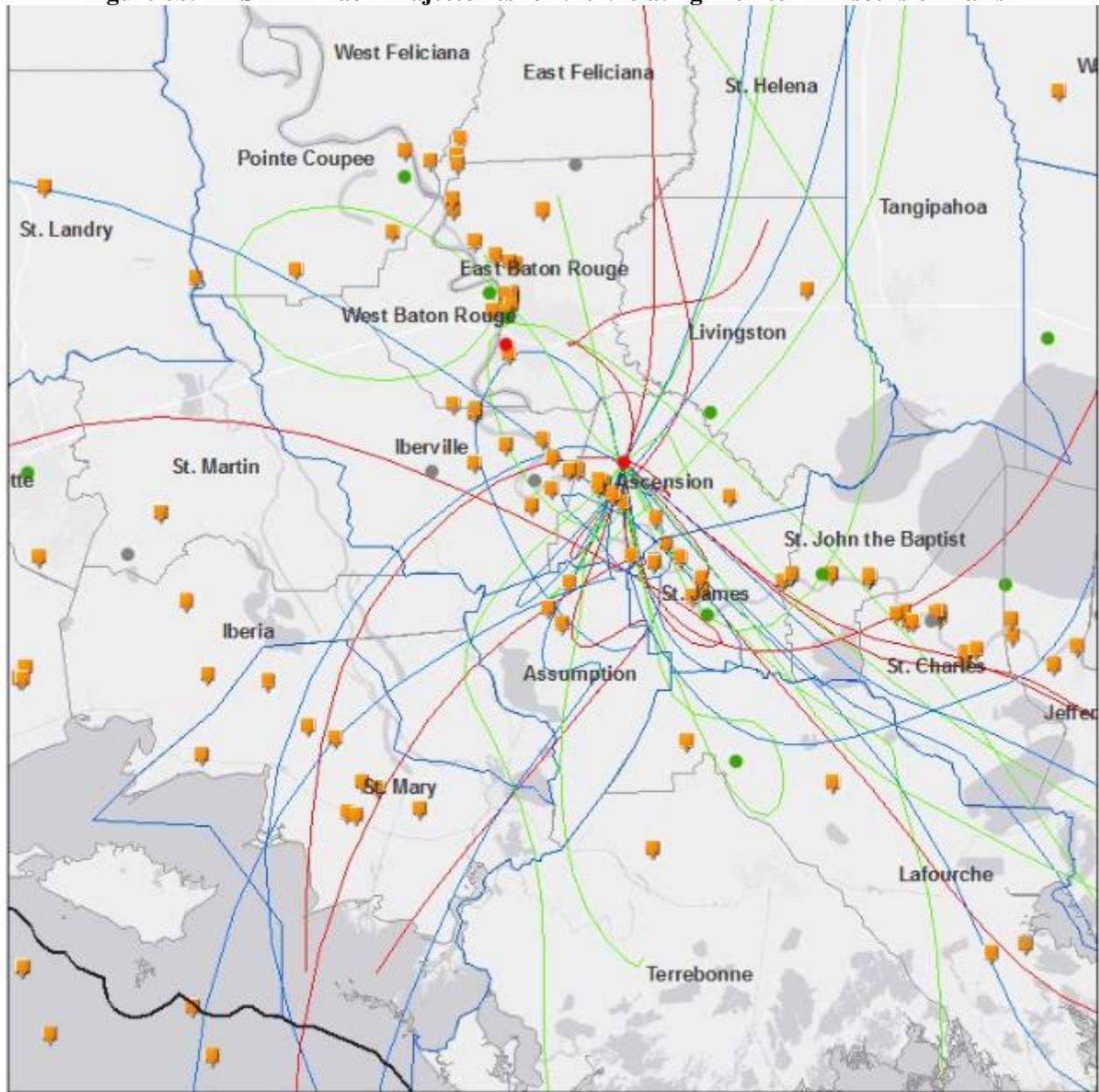
1:1,155,581

- State Boundaries
- CBSAs - Metropolitan Statistical Areas
- USA_Counties
- Site level DVs
 - Violating
- Attaining
- Incomplete



QAR/CACPS/ACAD/AGAG
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 GIS user community

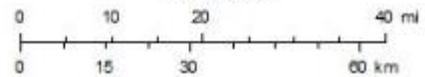
Figure 6b. HYSPLIT Back Trajectories for the Violating Monitor in Ascension Parish



July 18, 2017

1:1,155,581

- State Boundaries
- CBSAs - Metropolitan Statistical Areas
- USA_Countries
- Site level DVs
 - Violating
- Attaining
- Incomplete



QAR/OAQPS/AQA/DAQAG
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The HYSPLIT data for the violating monitor in East Baton Rouge Parish (Figure 6a) show that on days when the monitor exceeded the 2015 ozone NAAQS there are lines (back trajectories) demonstrating air movement from almost every direction, but more often from the south-southeast (SSE), north-northwest (NNW) and north-northeast (NNE). Most of these trajectories originate outside the area of analysis and many of the trajectories change direction as indicated by the circular, arching and looping lines to the northwest, east, southeast and southwest of the violating monitor.

The HYSPLIT data for the violating monitor in Ascension Parish (Figure 6b) show that on days when the monitor exceeded the 2015 ozone NAAQS there are back trajectories from almost every direction. Most of these trajectories also originate outside the area of analysis and several of the trajectories change direction as indicated by the circular, arching and looping lines to the northwest, south, and southeast of the violating monitor.

Analysis of back trajectories show numerous trajectories flowed through Iberville Parish before reaching the violating monitor in East Baton Rouge Parish and those flowing through Iberville to the violating monitor in East Baton Rouge Parish pass over the large point sources in Iberville Parish prior to reaching the violating monitor. Analysis of back trajectories show flow through Livingston Parish prior to reaching the violating monitors in Ascension and East Baton Rouge Parishes.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining non-attainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. 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 EPA evaluated the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. The Baton Rouge area does not have geographical or topographical features limiting air pollution transport within its air shed. Therefore, this factor did not provide data relevant for determining the appropriate nonattainment area boundary.

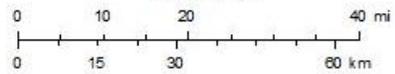
Figure 7. Topographic Illustration of the Physical Features



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- State Boundaries
- USA_Counties
- Baton Rouge NAA



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Web AppBuilder for ArcGIS
 Data: USEPA Office of Environmental Information (OEI), US Census Bureau | Source: U.S. Census Bureau | Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS |

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 intended Baton Rouge 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 or parishes, 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 intended designated areas.

The area of analysis has previously established nonattainment boundaries associated with the 1-hour and the 1997 and 2008 8-hour ozone NAAQS. The 1997 and 2008 8-hour ozone nonattainment area boundaries encompassed all of Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge parishes and is known as the Baton Rouge nonattainment area. The state recommended that the nonattainment boundary for the 2015 ozone NAAQS be the same five parishes designated as nonattainment under the 1997 and 2008 ozone NAAQS. The boundary recommended by the State falls within the CBSA boundary and within the boundary of the MPO, which in this area is the Capital Region Planning Commission. The State does not have jurisdiction in Indian country and the area of analysis does not include Indian country.

Conclusion for the Baton Rouge Area

Based on the assessment of the factors described above, EPA does not intend to modify the state's recommendation that the following parishes be included as part of the Baton Rouge nonattainment area because they have air quality monitors that indicate a violation of the 2015 ozone NAAQS and/or because they are contributing to a violation in a nearby area: Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge Parishes. These are the same parishes that were included in the Baton Rouge nonattainment area for the 1997 and 2008 ozone NAAQS.

The air quality monitors in Ascension and East Baton Rouge parishes are violating the 2015 ozone NAAQS based on the 2014-2016 DV and thus, these parishes are included in the nonattainment area.

In addition to the parishes with a violating monitor, EPA does not intend to modify the state's recommendation to include three other Parishes in the nonattainment area. Iberville Parish is among the highest regarding NO_x (4th) and VOC (3rd) emissions in the area of analysis. Analysis of back trajectories show numerous trajectories flowed through Iberville Parish before reaching the violating monitor in East Baton Rouge Parish and those flowing through Iberville to the violating monitor in East Baton Rouge Parish pass over the large point sources in Iberville Parish prior to reaching the violating monitor. Iberville Parish has the 4th highest population for the area, the 5th highest level of VMT, and more than 40 percent of workers living in Iberville Parish are travelling to the two parishes with violating monitors.

Livingston Parish has the second highest population, rate of population growth, and VMT in the area of analysis, the 4th highest VOC emissions and the 5th highest NO_x emissions. Back trajectories show flow through Livingston Parish prior to reaching the violating monitors in Ascension and East Baton Rouge Parishes.

Regarding the violating monitor in East Baton Rouge Parish – several back trajectories originate in Livingston Parish and several originate elsewhere and pass through Livingston Parish. Regarding the violating monitor in Ascension Parish – one back trajectory originates in Livingston Parish and several originate elsewhere and pass through Livingston Parish. There is only one large point source in Livingston Parish, but the Parish’s relatively high population and growth are indicators of high area and mobile source emissions of ozone precursors that may contribute to observed violations at the East Baton Rouge and Ascension Parish monitors. Within the area of analysis, Livingston Parish has the second highest VMT (1.3 billion) and 51% of workers residing in Livingston Parish commute to the two parishes with the violating monitors. The high VMT and high number of commuters also indicates the presence of motor vehicle emissions that may contribute to violations at the nearby monitors in East Baton Rouge and Ascension Parishes. These data support our recommendation that Livingston Parish contributes to the violations at the monitors in East Baton Rouge and Ascension Parishes.

West Baton Rouge Parish has only the 6th highest emissions of NO_x and VOC in the area of analysis, but has the second highest growth in VMT from 2008 to 2014 and 49 percent of commuters from West Baton Rouge Parish travel to the parishes with the violating monitors. Furthermore, our analysis of meteorological data show back trajectories representing air flow over the large point source in West Baton Rouge Parish prior to reaching the violating monitor in East Baton Rouge Parish.

Pointe Coupee Parish is not proposed for inclusion in the nonattainment area for the 2015 ozone NAAQS. Pointe Coupee Parish has the second highest NO_x emissions and the 5th highest VOC emissions within the area of analysis. However, the largest source in Pointe Coupee Parish (Big Cajun II or BCII) produces nearly 78 percent of the NO_x emissions in the Parish and is controlled more stringently than the major sources within the five parishes previously designated as nonattainment under the 2008 ozone NAAQS. BCII is under a Consent Decree (CD), which requires that NO_x emissions be continuously controlled by selective non-catalytic reduction (SNCR) no later than May 1, 2014 and further emissions limits are also specified in the CD.¹⁷ Pointe Coupee Parish is among the lowest in population with approximately 22,250 people, a population density less than 40 people per square mile, and generates less than 300 million VMT. Although Pointe Coupee is not nearby a parish with a violating monitor, HYSPLIT data shows some back trajectories pass through this parish before reaching the violating monitors. Prior to reaching the violating monitor in Ascension Parish however, one of the trajectories first passes through West Baton Rouge and Iberville Parishes, and the other first passes through East Baton Rouge Parish. Prior to reaching the violating monitor in East Baton Rouge Parish, all of the trajectories first pass through East or West Baton Rouge Parishes.

St. Helena, East Feliciana and West Feliciana parishes are not proposed for inclusion in the nonattainment area for the 2015 ozone NAAQS. These three Parishes rank the lowest for the emissions, population and growth, and transportation and commuting factors. These three counties all experienced a decrease in total population and a decrease in VMT. West Feliciana has one large point source, and East Feliciana and St. Helena Parishes have no large point sources. We note the NO_x sources in these three parishes are already controlled as stringently as such sources within the five parishes previously designated as nonattainment under the 2008 ozone NAAQS (67 FR 60877). Although HYSPLIT data shows some back trajectories pass through each of these parishes before

¹⁷ The CD is provided in the docket for this rulemaking action. In addition, we note that all major sources of NO_x in Pointe Coupee Parish are controlled as stringently as the major sources within the five parishes previously designated as nonattainment under the 2008 ozone NAAQS (see 67 FR 60877, 9/27/02). The action at 67 FR 60877 approved a state implementation plan submittal from the State establishing the lowest emission limitation that a particular source can meet by applying a control technique that is reasonably available considering technological and economic feasibility, also known as Reasonably Available Control Technology or RACT.

reaching the violating monitor in some instances they first pass through Livingston, East Baton Rouge and/or Iberville Parishes before looping back to the violating monitor. Most of the other trajectories originate further north and then pass over the large point sources in East Baton Rouge Parish before reaching the violating monitor.

Therefore, in conclusion of our review and analyses of the five factors for the parishes in the area of analysis, we do not intend to modify the State's recommendation that the Baton Rouge nonattainment area for the 2015 ozone standard be comprised of Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge parishes.