

# Toward Net-Zero

## Regional Emissions Action Plan





**NORTHEAST ARKANSAS  
REGIONAL TRANSPORTATION  
PLANNING COMMISSION**

**RESOLUTION 22-05**

**A Resolution Adopting the Regional Emissions Action Plan (Toward Net-Zero)**

**WHEREAS**, the Transportation Policy Committee & the Technical Advisory Committee of the Northeast Arkansas Regional Transportation Planning Commission (N.A.R.T.P.C.) is the officially designated MPO for the Jonesboro metropolitan area; and

**WHEREAS**, pursuant to 23 U.S. Code § 134, the metropolitan planning organizations (MPOs) shall maintain a transportation planning process that is “continuing, cooperative, and comprehensive” (3-C); and

**WHEREAS**, the Policy Committee has reviewed the Regional Emissions Action Plan including the potential projects and action items, and found it to be in agreement with federal and state initiatives, and in compliance with the established Public Participation Plan; and

**WHEREAS**, the N.A.R.T.P.C. has found the Regional Emissions Action Plan to be in compliance with the MPO Metropolitan Transportation Plan (Propel 2045), specifically regarding Goals 1 and 4 with recommended actions to upgrade JET services and lessen the environmental impact of Vehicle Miles Traveled within the metropolitan area (Attachment A); and

**WHEREAS**, the Regional Emissions Action Plan serves as a support document for members of the N.A.R.T.P.C. that elect to participate in the outlined strategies and initiatives.

**NOW, THEREFORE, BE IT RESOLVED**, by the Transportation Policy Committee of the N.A.R.T.P.C.:


**The Northeast Arkansas Regional Transportation Planning Commission (N.A.R.T.P.C.) does hereby adopt the Regional Emissions Action Plan.**

Duly recorded this 17 day of May, 2022.

**SIGNED:**

  
John Street  
Chairperson  
Council Member, City of Jonesboro

**ATTEST:**

  
Alan Pillow  
Secretary  
MPO Director, N.A.R.T.P.C.

## **Acknowledgments**

A special thanks to the Arkansas Department of Environmental Quality's Office of Air Quality for providing necessary data and insight.

## **Other Partners**

Cities of Bay, Bono, Brookland, and Jonesboro  
Craighead County

## **MPO Staff**

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Plan Prepared by Northeast Arkansas Regional Transportation Planning Commission  
(N.A.R.T.P.C.) Staff 2022



**NORTHEAST ARKANSAS  
REGIONAL TRANSPORTATION  
PLANNING COMMISSION**

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Complaints of alleged discrimination related MPO programs and activities may be directed to Mr. Alan Pillow, ADA/504/Title VI Coordinator, N.A.R.T.P.C., P. O. Box 1845, Jonesboro, Arkansas, 72403-1845, (870)933-4623 (Voice/TTY 711). Mr. Pillow can also be contacted at the following email address: [apillow@jonesboro.org](mailto:apillow@jonesboro.org). Free language assistance for Limited English Proficiency individuals is available upon request.

This notice is available from the ADA/504/Title VI Coordinator in large print, on audio tape, and in Braille.

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# Chapter 1: Introduction

# Introduction

## 1.1 Plan Purpose

Northeast Arkansas has thrived in recent years with steady growth in economic development as well as overall population. With population growth and economic expansion comes responsibilities, both to the people and the environment in which we inhabit. It is well documented that transportation, specifically transportation involving vehicles powered by fossil fuels, is a major contributor of emissions in the form of airborne pollutants and various greenhouse gases<sup>1</sup>.



Image Source: MPO Staff

With continued regional growth, an increase in emissions is sure to be expected, and this increase within an urbanized area can lead to air quality deterioration while simultaneously contributing to climate change. Therefore, it is paramount that officials, at every level of government, consider the impact of vehicular emissions when carrying out transportation related projects. The Northeast Arkansas Regional Transportation Planning Commission has displayed leadership in the development of **Toward Net-Zero**, a Regional Emissions Action Plan which identifies regional actions and strategies to preserve air quality and reduce greenhouse gas emissions caused by gasoline-powered vehicles. The goals of this plan are as follows:

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<sup>1</sup> Arkansas Department of Environmental Quality: <https://www.adeq.state.ar.us/air/planning/ozone/cars.aspx>

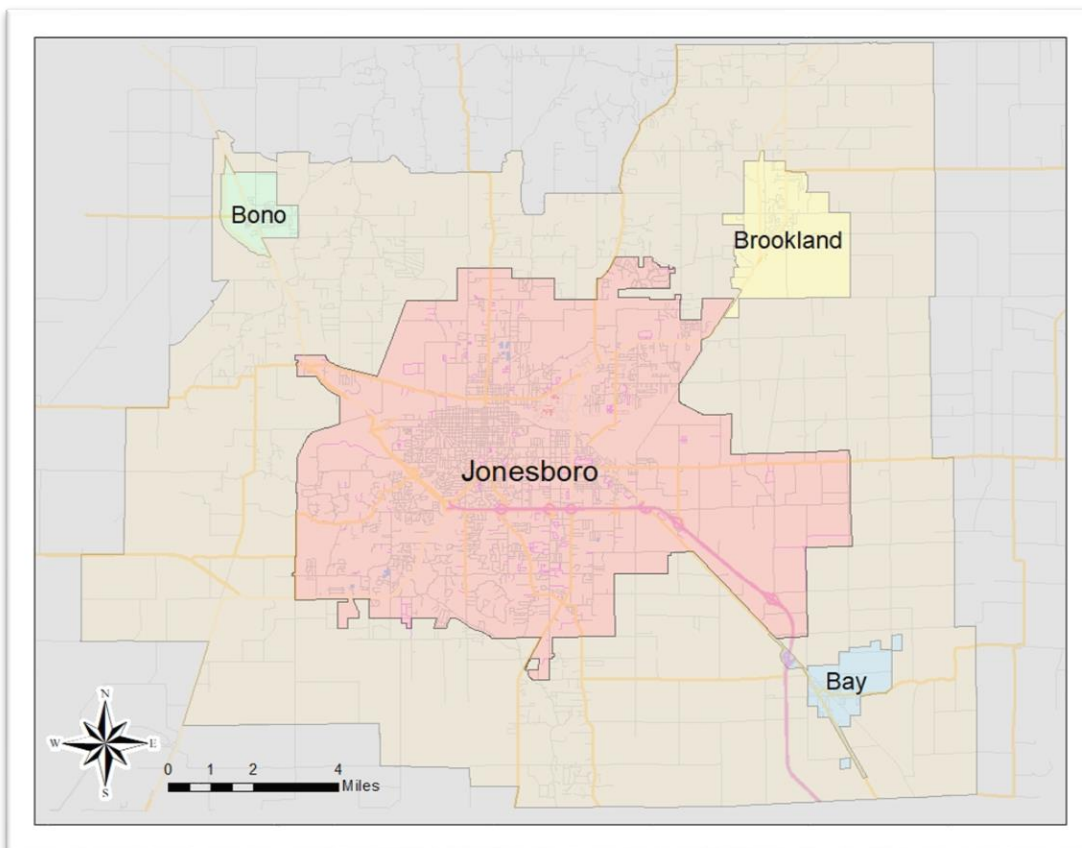


- ❖ Preservation and enhancement of the natural environment, improve air quality, and promote active lifestyles within the metropolitan planning area
- ❖ Conservation of Northeast Arkansas as an attainment area by maintaining healthy air quality and meeting federally mandated standards for all criteria air pollutants
- ❖ Reduction of greenhouse gas emissions and related climate impacts

## 1.2 Local Transportation Planning

Since its inception in 2003, the Northeast Arkansas Regional Transportation Planning Commission (N.A.R.T.P.C.) has served as the designated metropolitan planning organization (MPO) for the cities of Bay, Bono, Brookland, Jonesboro, and some unincorporated portions of Craighead County. MPO's were created to ensure that federal funding for transportation projects and programs were utilized based on a "3-C" (continuing, cooperative, and comprehensive) planning process. As a result, the N.A.R.T.P.C. is tasked with preparing consensus-driven, fiscally-constrained plans for the development of an efficient, equitable, and safe regional transportation system.

**Figure 1.1: N.A.R.T.P.C. Planning Area**



The major products of the N.A.R.T.P.C.'s planning process include the:

- Unified Planning Work Program (UPWP)
- Public Participation Plan (PPP)
- Metropolitan Transportation Plan (MTP); and
- Transportation Improvement Program (TIP).

Additional plans, special reports, corridor/sub-area studies, and analyses of transportation issues may also be produced on a needed basis.

### 1.3 Plan Development History

In the largest investment to infrastructure in the history of the United States, the Infrastructure Investment and Jobs Act (IIJA) was signed into law in November 2021. Within this national undertaking, a significant emphasis was placed on the mitigation of damages brought about by fossil fuel powered vehicles, specifically climate change<sup>2</sup>. Emissions from fossil fuel burning vehicles has become a growing concern for the N.A.R.T.P.C., not only because of the impact to climate change, but the potential threat that emissions pose to the future air quality within the region. This plan was created in an attempt to preserve the air quality of Northeast Arkansas as well as do our part as a region to combat the effects of climate change.

Input from local representatives and citizens is critical to ensure that each plan created by the N.A.R.T.P.C. is effective, equitable and beneficial to the growth and general wellbeing of the region. It is the intention of the MPO staff and Policy Board that that **Toward Net-Zero** will be a living document subject to periodic review and update in order to provide the most relevant data and guidance.

Per the N.A.R.T.P.C.'s Public Participation Plan, MPO staff garnered public input for the Regional Emissions Action Plan by carrying out the following:

- Meetings with the MPO Citizen Advisory Committee
- Released draft plan for obligatory 15-day public comment period from March 29, 2022 to April 12, 2022 (15 days)
- Developed a public website (with a dedicated public comment page) to display a complete draft of the plan

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<sup>2</sup> Fact Sheet- The Bipartisan Infrastructure Deal: <https://www.whitehouse.gov/briefing-room/statements-releases/2021/11/06/fact-sheet-the-bipartisan-infrastructure-deal/>



# Toward Net-Zero

## Regional Emissions Action Plan



- Newspaper advertisement published in the Jonesboro Sun on March 29, 2022
- Mailing or delivering of hard copies of the draft plan to the individual City Halls of Bay, Bono, and Brookland as well as the Jonesboro Public Library.



## Chapter 2: Emissions Overview

# Emissions Overview

## 2.1 What Are Emissions?

The term “**emissions**” refers to gases and particles that are released into the air by various sources. The discussion of emissions has been a hot topic since the second half of the 20<sup>th</sup> century, as research has shown that some emissions can greatly impact our daily lives. In fact, studies have shown that emissions can affect visibility, public health<sup>1</sup>, and even our climate<sup>2</sup>. There are multiple types of emissions; two of which can be seen below:

- **Point sources** - stationary sources such as: factories and power plants
- **Mobile sources** – sources of emissions that are not bound to one location such as: **cars**, **trucks**, airplanes, and even lawnmowers

For the purposes of this plan, we will be discussing emissions in the context of transportation planning. Our primary objectives are to explore how transportation can impact the region’s overall air quality and contribute to climate change while providing a series of action items in order to help reduce and mitigate the regional effects of harmful transportation related emissions. The two major groupings of emissions we will be discussing are **Airborne Pollutants** and **Greenhouse Gases**.

## 2.2 Airborne Pollutants

The Clean Air Act (CAA) was passed in 1963, and was last amended in 1990 in an attempt to regulate air emissions. The CAA authorized and required the EPA to establish National Ambient Air Quality Standards (NAAQS) for six principle Airborne Pollutants (also referred to as **criteria pollutants**). These six pollutants, which are considered to be harmful to the public in certain quantities are: **Carbon Monoxide (CO)**, **Lead (Pb)**, **Nitrogen Dioxide (NO<sub>2</sub>)**, **Ozone (O<sub>3</sub>)**, **Particulate Matter (PM)**, and **Sulfur Dioxide (SO<sub>2</sub>)**<sup>3</sup>. For the purposes of this plan, we will only be focusing on Carbon Monoxide (CO), Nitrogen Dioxide (NO<sub>2</sub>), and

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<sup>1</sup> State of the Air Report-2020, ADEQ: <https://www.adeg.state.ar.us/air/>

<sup>2</sup> Overview of Greenhouse Gases, EPA, 2021: <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>

<sup>3</sup> NAAQS Table, EPA, 2021: <https://www.epa.gov/criteria-air-pollutants/naqs-table>

Ozone ( $O_3$ ) as these are the only NAAQS criteria pollutants significantly generated by driving fossil fuel powered vehicles<sup>1</sup>.

### 2.2.1 Carbon Monoxide (CO)

Carbon Dioxide (CO) is a colorless, odorless gas which becomes extremely dangerous when exposed in a high enough concentration. It is unlikely for CO concentrations to reach very high levels outdoors. However, when CO levels become somewhat elevated outdoors, it can put people with heart conditions at serious risk. CO is produced by the incomplete combustion of fossil fuels, with a significant amount originating from [mobile sources](#) of air pollution.

The Arkansas Department of Environmental Quality reported that in 2017, “On road” sources of emissions (Emissions Created from Cars and Trucks), which accounted for 18 percent of all CO emissions in the state of Arkansas. This makes on road transportation the highest anthropogenic contributor of CO emissions in the entire state.

*On a positive note, the yearly amount of anthropogenic CO has been slowly falling in the state of Arkansas since 2008.*

### 2.2.2 Nitrogen Oxides (NO<sub>x</sub>) & Nitrogen Dioxide (NO<sub>2</sub>)

Nitrogen Oxides (NO<sub>x</sub>) are a group of highly reactive gases whose presence can lead to a myriad of environmental and health concerns. Exposure to NO<sub>x</sub> has been associated with the onset of respiratory symptoms in healthy people, with more prevalent symptoms in children with preexisting respiratory conditions<sup>4</sup>.

Nitrogen Dioxide (NO<sub>2</sub>) is used by the EPA’s NAAQS as an indicator for all nitrogen oxides. Much like CO, NO<sub>2</sub> and NO<sub>x</sub> are produced and emitted into the air in the process of fossil fuel combustion. In 2017, an emissions inventory showed that Arkansas produced 197,332 tons of NO<sub>x</sub> emissions, with 28 percent deriving from on road sources. On road sources are the largest contributor of NO<sub>x</sub><sup>1</sup>.

### 2.2.3 Ground-Level Ozone (O<sub>3</sub>)

Ground-Level Ozone (O<sub>3</sub>) is created when NO<sub>x</sub> and Volatile Organic Compounds are present in higher concentrations. Heat and sunlight assist in the production of O<sub>3</sub>, so Ozone is more likely to be a concern on warm, sunny days. Much like the previous two airborne pollutants, O<sub>3</sub> can be harmful to both the environment and public health. Because NO<sub>x</sub> is one of the primary components

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<sup>4</sup> America’s Children and the Environment, EPA, 2015

of O<sub>3</sub>, transportation related emissions are a serious contributor to ground-level ozone<sup>5</sup>.

The state of Arkansas has a season in which it forecasts O<sub>3</sub> concentrations. From May 1<sup>st</sup> to September 30<sup>th</sup>, O<sub>3</sub> concentrations are monitored in areas of concern across the state. In 2020, there were only two days where a county's O<sub>3</sub> concentration was considered "unhealthy for sensitive groups," and both days only pertained to Crittenden County.

## 2.3 Greenhouse Gas Emissions

We've discussed the effects of transportation related emissions on everyday air quality, but we have not yet discussed the role that transportation plays in climate change. According to the Environmental Protection Agency (EPA), the largest contributor of observed climate change in the last century has been greenhouse gases emitted from human activities <sup>6</sup>(See figure 2.1). At present the transportation sector alone accounts for 29% of greenhouse gas emissions in the United States, making it the largest single source of greenhouse gas in the nation<sup>7</sup>. According to the EPA, Greenhouse gases from human activities are the most significant driver of observed climate change since the mid-20<sup>th</sup> century.

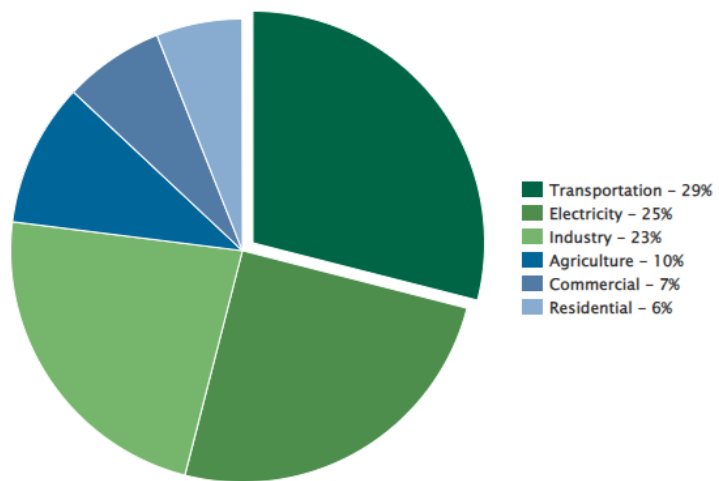


Figure 2.1: 2019 U.S. GHG Emissions by Sector

Data Source: EPA

Similar to airborne pollutants regulated by the Clean Air Act, there are multiple greenhouse gases emitted from vehicles powered by fossil fuels including: methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and hydrofluorocarbon (HFC). However, these gases only make up a small portion of the GHG's emitted from the

<sup>5</sup> Ground-level Ozone Basics, EPA, 2021: <https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics#formation>

<sup>6</sup> Climate Change Indicators, EPA, 2021: <https://www.epa.gov/climate-indicators/greenhouse-gases>

<sup>7</sup> Fact Sheet: The Bipartisan Infrastructure Bill

transportation sector. The vast majority of GHG's from transportation comes in the form of carbon dioxide (CO<sub>2</sub>)

### 2.3.1 Federal Emphasis on Climate Change

Over the past few years, a new urgency has been placed on combating the onset and subsequent effects of climate change. The urgency appears to have increased further with the passing of the Infrastructure Investment and Jobs Act (IIJA). One of the cornerstones of the IIJA was the establishment of the National Electric Vehicle Infrastructure Formula Program, to help combat climate change. This program is expected to allocate \$7.5 billion to establish a national network of electric vehicle charging stations.

In the next chapter, we will look at a population profile for Craighead County in order to see the region's growth in recent years and better understand how that growth could impact the amount of airborne pollutants and greenhouse gases generated.





Chapter 3:  
**Regional Population Profile**



## Regional Population Profile

### 3.1 Population Estimates

In Chapter 1, we established that the N.A.R.T.P.C. jurisdiction encompasses the cities of Bay, Bono, Brookland, Jonesboro, and some unincorporated portions of Craighead County. It is evident from the 2020 Census that region has experienced significant population growth over the last 20 years. **(See Table 3.1 below)**

**Table 3.1: Population Growth for N.A.R.T.P.C. Planning Area 2000-2020**

<i>N.A.R.T.P.C. Planning Area</i>	<b>2000 Population</b>	<b>2010 Population</b>	<b>2020 Population</b>	<b>Percent Change 2000-2020</b>	<b>Average Annual Growth</b>
<b>Bay</b>	1,800	1,801	1,876	4.2%	0.21%
<b>Bono</b>	1,512	2,131	2,409	59.3%	2.97%
<b>Brookland</b>	1,332	1,642	4,064	205.1%	10.26%
<b>Jonesboro</b>	55,515	67,263	78,576	41.5%	2.08%
<b>Craighead County</b>	82,148	96,443	111,231	35.4%	1.77%

With Craighead Forest Park, The Forum Theatre, a thriving downtown area, and a myriad of other local attractions and developments (both established and upcoming), it is anticipated that the population of Craighead County will continue to rise. Additionally, it cannot be overstated that



Image Source: First Security Bank

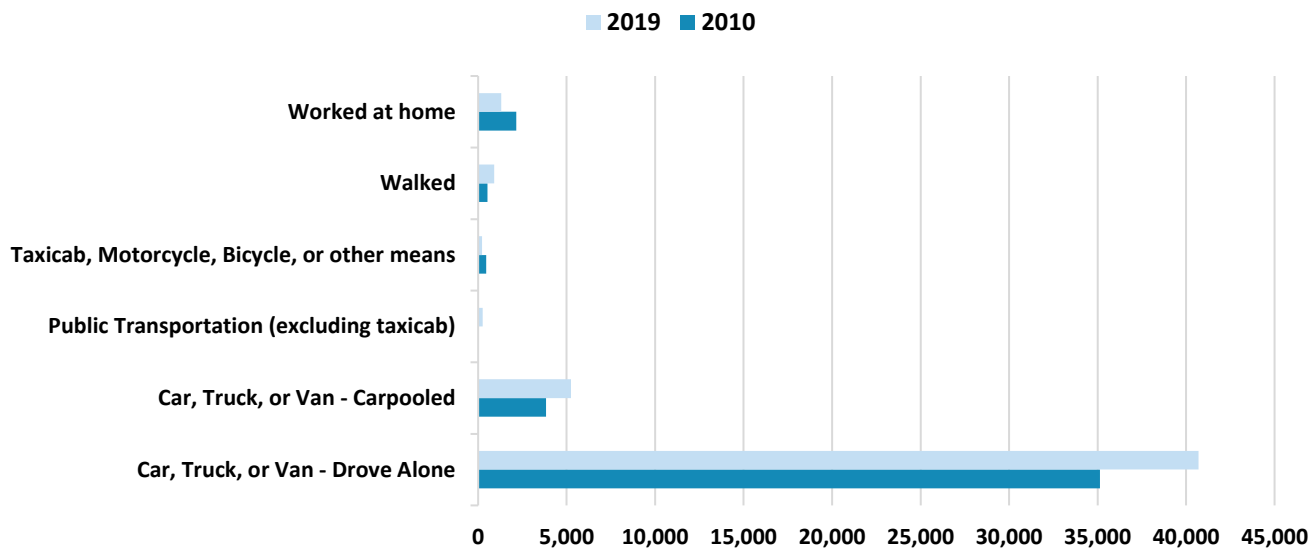
Arkansas State University has been a driving force in the development of the region. With nearly 14,000 students enrolled, various high-profile sports programs,

and the First National Bank Arena, it is apparent that Arkansas State University will continue fostering growth for years to come.<sup>1</sup>

### 3.2 Regional Travel Behavior

According to 2019 census estimates, there were **48,636** workers aged 16 and over residing in Craighead County, the vast majority reported that they work within the county itself. Of the 48,636 workers, living in Craighead County, roughly **86%** drive to work alone (car, truck, or van). (See Figure 3.1)

Figure 3.1: U.S. Census Comparison of Workers Aged 16 and Over Mode of Travel to Work - Craighead County



Data Source: U.S. Census Bureau, American Community Survey

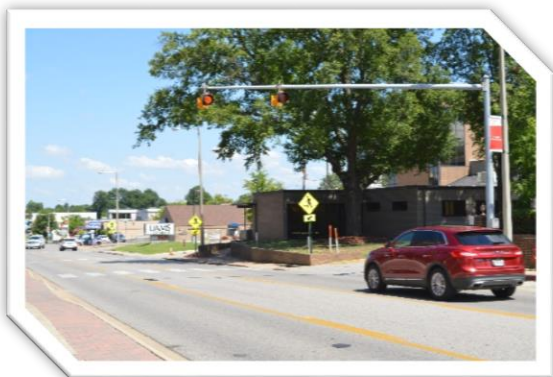


Image Source: N.A.R.T.P.C. Staff

Additionally, 2015 census estimates indicate that **9,627 workers commuted from their county of residence to Craighead County**. Of note, 2,994 of Greene County's workers and 2,617 of Poinsett County's workers commuted from their county of residence to Craighead County, which comprised **17%** of the former's workforce and **29%** of the latter's. (See Table 3.2 below) These figures do not even begin to factor in the number of

<sup>1</sup> Arkansas State University, 2021: <https://www.astate.edu/news/fall-2021-enrollment-shows-gains-in-several-areas-total-of-13-772>

people that visit from outside of the county to enjoy the many leisurely activities available to them in Craighead County.

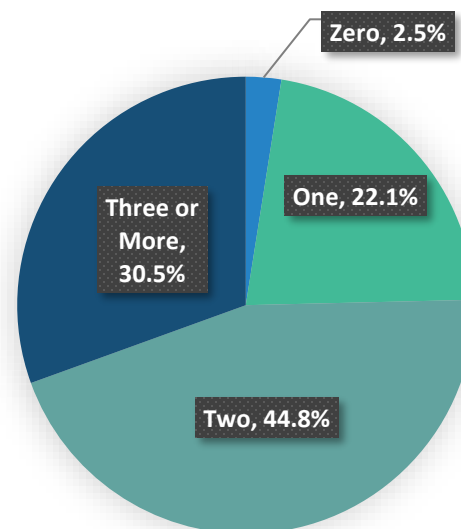
**Table 3.2: 2015 5 Year Estimate of Commuting Flow to Craighead County**

Resident State	Resident County	Workers Commuting to Craighead County	Margin of Error (+/-)	Number of Workers	Margin of Error (+/-)	% of Respective County's Workforce
AR	Greene County	2,994	403	17,339	616	<b>17%</b>
AR	Poinsett County	2,617	300	8,904	380	<b>29%</b>
AR	Lawrence County	918	169	6,308	337	<b>15%</b>
AR	Randolph County	500	152	6,546	401	<b>8%</b>
AR	Mississippi County	464	146	16,749	645	<b>3%</b>
AR	Jackson County	282	75	5,460	365	<b>5%</b>
AR	Cross County	199	78	6,975	306	<b>3%</b>
MO	Dunklin County	180	80	11,505	444	<b>2%</b>
AR	Clay County	172	78	6,197	257	<b>3%</b>
TN	Shelby County	134	64	418,622	2,987	<b>0%</b>
AR	Pulaski County	122	94	179,620	2,074	<b>0%</b>
AR	St. Francis County	119	94	8,993	464	<b>1%</b>

Data Source: U.S. Census Bureau, American Community Survey

Such significant growth in the number of people/workers within the metropolitan planning area most certainly contributes to the increase in the daily number of vehicles traveling the region's roadways. In 2019, the U.S. Census Bureau estimated that **75.3%** of households with workers aged 16 and over in Craighead County had at least two vehicles available for use. (See Figure 3.2) With this demographic data, we can begin to look at how all of this traffic could impact our air and overall environment, both now and in the future.

**Figure 3.2: 2018 U.S. Census Estimates Percentage of Household Vehicles - Craighead County**



Data Source: U.S. Census Bureau, American Community Survey



Chapter 4:  
**Regional Emissions Analysis**

# Regional Emissions Analysis

The intent of this chapter is to provide an assessment of general air quality for Craighead County utilizing data made available by the Office of Air Quality of the Arkansas Department of Environmental Quality. Additionally, we will utilize the demographic data discussed in chapter 3 along with formulas provided by the Environmental Protection Agency to provide an estimate of greenhouse gases produced by motor vehicles in Craighead County.

## 4.1 Regional Air Quality Summary

We discussed in Chapter 2 that the Clean Air Act authorized the establishment of National Ambient Air Quality standards for six **criteria pollutants**. The Office of Air Quality (OAQ) of the Arkansas Department of Environmental Quality utilizes air quality monitors to ensure that areas of concern remain in a state of **attainment**<sup>1</sup> for each criteria pollutant. Stationary sources of air pollution must receive a permit from the OAQ in order to continue operating. Permits make certain that operation of these stationary sources do not emit air pollutants to the degree that it may negatively impact public health or the environment.

In Craighead County there are 39 stationary operations that require an air permit. A full listing of these organizations and their permits can be found on the next page (**See Table 4.1**).

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<sup>1</sup> If the air quality in a geographic area meets or is cleaner than the national standard, it is called an attainment area. NAAQS Designation Process, EPA

# Toward Net-Zero

## Regional Emissions Action Plan

**Table 4.1: Active Air Permits for Stationary Sources in Craighead County**

Facility Name	City	Status	Permit Type
Acme Brick Co-JBP Plant	Jonesboro	Active	Title V
CAMFIL USA, INC.	Jonesboro	Active	Minor Source
CHILDRESS G. & E.	Monette	Active	Minor Source
BLACK OAK GIN COMPANY	Black Oak	Active	Minor Source
KIECH-SHAVER MILLER GIN	Monette	Active	Minor Source
MONETTE CO-OP	Monette	Active	Minor Source
ARK GLASS CONTAINER	Jonesboro	Active	Title V
RICELAND-JONESBORO	Jonesboro	Active	Title V
BUSCH AGRI-JONESBORO RICE MILL	Jonesboro	Active	Minor Source
HARVEST RICE-OTWELL	Otwell	Active	Minor Source
ARK STATE UNIVERSITY	Jonesboro	Active	Minor Source
JONESBORO, CITY OF	Jonesboro	Active	Minor Source
HERMANN CO./ANCHOR PACKAGING	Jonesboro	Active	Minor Source
CRAIGHEAD CO SWDA JONESBORO	Jonesboro	Active	Title V
POST FOODS, LLC/JONESBORO	Jonesboro	Active	Minor Source
CRANE COMPOSITES, INC	Jonesboro	Active	Title V
BUTTERBALL, LLC	Jonesboro	Active	Minor Source
GREAT DANE TRAILERS	Jonesboro	Active	Minor Source
ABB Installation Products, Inc	Jonesboro	Active	Minor Source
FRITO-LAY JONESBORO	Jonesboro	Active	Minor Source

Facility Name	City	Status	Permit Type
JONESBORO WATER & LIGHT-NW SUB	Jonesboro	Active	Title V
SOUTHLAND GIN, INC.	Lake City	Active	Minor Source
NESTLE USA	Jonesboro	Active	Air Reg 18.315
TOOMBS TRADE SERVICE-JONESBORO	Jonesboro	Active	Minor Source
EMERSON FUNERAL HOME, INC.	Jonesboro	Active	Minor Source
MFA OIL COMPANY	Lake City	Active	Minor Source
Mid South Sales, LLC	Jonesboro	Active	Minor Source
MURPHY OIL USA, INC/JONESBORO	Bono	Active	Minor Source
ITNOLAP PALLET & CRATING, LLC	Jonesboro	Active	Minor Source
UNILEVER MANUFACTURING (US)INC	Jonesboro	Active	Minor Source
WINDMILL RICE CO, LLC	Jonesboro	Active	Air Reg 18.315
Trinity Rail Maint/Plnt #4034	Jonesboro	Active	Minor Source
CITY OF JONESBORO/PUBLIC WORKS	Jonesboro	Active	Title V
NE ARK BAPTIST MEMORIAL HEALTH	Jonesboro	Active	Minor Source
FAMILY PET CLINIC, P.A.	Jonesboro	Active	Minor Source
Risever Machinery, LLC	Jonesboro	Active	Air Reg 18.315
Delta Peanut-Jonesboro ,AR	Jonesboro	Active	Air Reg 18.315
ATLAS ASPHALT, INC	Jonesboro	Active	Minor Source
ASPHALT PRODUCERS, LLC	Jonesboro	Active	Minor Source

Data provided by Office of Air Quality

In Chapter 3, we established that the population within the metropolitan planning area is growing, and the fact that Craighead County has 39 stationary operations that require an air permit indicates that businesses in this region are thriving. This growth and level of industrial activity could cause anxiety to those concerned with the overall air quality of the region, but at present Craighead County remains **in attainment for all six criteria pollutants**. This means that, by the standards set by the Clean Air Act, the metropolitan planning area has good air quality that is safe for all.

However, just because the metropolitan planning area is in attainment **today**, does not mean that it will remain an attainment area permanently. It is expected that the population in this region will continue to grow in the coming years, and increases in population density often lead to a decrease in air quality<sup>2</sup>. As we discussed in Chapter 2, one of the primary drivers for urban air pollution is transportation. In Chapter 3 we established that most households in Craighead County have two or more cars, and that 86 percent of our workers drive to work alone. These observations indicate that, without a change in regional behaviors, a rise in population could be expected to directly impact the region's future air quality.

## 4.2 Regional Greenhouse Gas Emissions

At present, the metropolitan planning area does not have an in-depth greenhouse gas emissions inventory. What we do have is a formula, provided by the Environmental Protection Agency (EPA), to estimate the amount of **carbon dioxide** emitted per mile traveled<sup>3</sup>. This formula paired with the appropriate demographic data will provide us with a rough estimate of the amount of CO<sub>2</sub> emitted by vehicles in Craighead County annually.

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<sup>2</sup> Population Density and Urban Air Quality, Rainland Borck & Philip Schrauth, Regional Science and Urban Economics, Volume 86, 2021:

<https://www.sciencedirect.com/science/article/abs/pii/S0166046220302817?via%3Dihub>

<sup>3</sup> In Chapter 2 we established that CO<sub>2</sub> is the primary greenhouse gas emitted by gasoline powered vehicles.



According to the EPA, on average for every gallon of gasoline used to power a light-duty vehicle, 8,887 grams of CO<sub>2</sub> are produced<sup>4</sup>.

**CO<sub>2</sub> Emissions from a gallon of gasoline**  **8,887 grams of CO<sub>2</sub>/gallon of gasoline**

The amount of CO<sub>2</sub> emitted per gallon of gasoline can then be divided by Miles per Gallon (MPG) to produce CO<sub>2</sub> emissions per mile. According to an article provided by energy.gov, the average fuel economy for light-duty vehicles in 2020 was 25.7 MPG<sup>5</sup>. For our estimates, 25.7 MGP is the value that we will use.

**CO<sub>2</sub> emissions per mile = CO<sub>2</sub> per gallon/MPG = 8,887/25.7 = 346 grams of CO<sub>2</sub> per mile**

The EPA and the Federal Highway Administration (EPA) also estimate that the average driver travels around 11,500 miles per year. Multiplying annual miles driven per driver by CO<sub>2</sub> emissions per mile gives us an estimate of annual CO<sub>2</sub> emissions per driver annually.

**Annual CO<sub>2</sub> emissions = (CO<sub>2</sub> per gallon/MPG) x miles = (8,887/25.7) x 11,500 = 3.98 metric tons**

Utilizing the information provided by the EPA and the FHWA we have established that the average driver is expected to produce roughly 3.98 tons of CO<sub>2</sub> each year. We could extrapolate this information even further if we pair the annual CO<sub>2</sub> emissions with the demographic data from Chapter 3. If we knew how many drivers there were in Craighead County for a specific year we could estimate how much CO<sub>2</sub> was produced by drivers in Craighead County annually. Unfortunately, that data is not accessible, but what is available is the number of workers residing in Craighead County. We know that the Census Bureau estimated that in 2019 there were 48,636 workers aged 16 and over residing in Craighead County. Among those workers, 40,697 drive to work alone. If we multiply the annual amount of CO<sub>2</sub> emissions per driver (3.98 tons) by the 40,697 workers that reside in Craighead County and drive to work alone, we get 161,838 metric tons of CO<sub>2</sub> produced annually.

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<sup>4</sup> Greenhouse Gas Emissions from a Typical Passenger Vehicle, 2018:

<https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle>

<sup>5</sup> Office of Energy Efficiency & Renewable Energy, 2021: <https://www.energy.gov/eere/vehicles/articles/fotw-1177-march-15-2021-preliminary-data-show-average-fuel-economy-new-light>

**Annual CO<sub>2</sub> emissions = (CO<sub>2</sub> per gallon/MPG) x miles x # of workers that commute alone**

**Annual CO<sub>2</sub> emissions = (8,887/25.7) x 11,500 x 40,697 = 161,838 metric tons**

This is obviously a very conservative estimate of the amount of CO<sub>2</sub> produced by vehicles in Craighead County annually. We have not included the number of vehicles that drive into Craighead County daily or the number of people that drive for non-work related reasons. However, this does provide us with a general idea of the amount of CO<sub>2</sub> that we can expect to be produced by vehicles annually in Craighead County.

In the next chapter, we will explore some suggested actions that would reduce greenhouse gas emissions from vehicles and help maintain northeast Arkansas' pristine air quality.



## Chapter 5: Regional Strategies & Recommendations



## Regional Strategies & Recommendations

In order to mitigate the amount of airborne pollutants and greenhouse gases produced by vehicles, the MPO staff has identified a series of actions and strategies. These strategies have been broken down into four categories:

- ❖ Active Transportation
- ❖ Public Transportation
- ❖ Adoption of Electric Vehicles
- ❖ Continued Improvements and Monitoring

### 5.1 Active Transportation

Active transportation is the act of moving one place to another using your own body for propulsion. Some examples of active transportation are walking, running, biking, and even roller skating. In previous chapters we established that traffic congestion can negatively impact air quality, and vehicle miles traveled directly contribute to the amount of greenhouse gas emitted into the atmosphere. Promoting and engaging in active transportation is an excellent way to reduce emissions from vehicles, as it reduces both traffic congestions and overall vehicle miles travelled. Below is a series of strategies that MPO staff believe would promote active transportation within the region:

- ❖ Advocate for the development of trails leading to various hubs within the metropolitan planning area (MPA), including but not limited to, the trail system detailed in the Jonesboro Quality of Life & Connectivity Master Plan
- ❖ Advocate for safe, sufficient, and equitable infrastructure for pedestrians and bicyclists within the planning area
- ❖ Continue carrying out the goals and corresponding action items within the MPO's Safety Action Plan & Regional Active Transportation Plan

The MPO's Regional Active Transportation Plan was developed in 2017 in order to address existing issues regarding multimodal transportation safety as well as network connectivity/accessibility within the region. Listed plan strategies from the Regional Active Transportation Plan include:

- Road accommodations (sidewalks, crosswalks, bike lanes/sharrows and shared use paths)
- Established land criteria for the incorporation of active transportation in upcoming development projects
- Development and enforcement of bicycle/pedestrian laws, policies and ordinances
- Increased signage and lighting
- Increase transit service/connections
- Increased community education/promotion of active transportation
- Research of funding sources for active transportation projects/implementation

A link to the Regional Active Transportation Plan is provided below:

<https://www.jonesboro.org/DocumentCenter/View/4073/Regional-Active-Transportation-Plan-PDF>

## 5.2 Public Transportation

It is apparent that public transportation will play an integral role in any efforts to reduce vehicular emissions. It also makes sense that moving more people in fewer vehicles would lessen the amount of air pollutions produced from daily travel and simultaneously lower the daily vehicles miles traveled per person. According to an article by the Federal Transit Administration, one driver per household switching to public transportation for a daily commute of 10 miles could save an estimated 4,697 pounds of CO<sub>2</sub> per household per year<sup>1</sup>.

As priorities change at the federal level regarding electric vehicles, public transportation could become an even greater asset. The N.A.R.T.P.C. has taken these shifting priorities into account and is prepared to support future attempts at innovation from local transit agencies. An example of such assistance is the resolution passed by the N.A.R.T.P.C.'s policy board in 2021 supporting Jonesboro Economic Transportation's (JET's) attempt to secure funding for low or no emission buses. You will find this strategy and other proposed actions that would promote public transportation listed below:

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<sup>1</sup> Public Transportation's Role in Responding to Climate Change, 2010:  
<https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/PublicTransportationsRoleInRespondingToClimateChange2010.pdf>

- ❖ Support JET's requests for Low-to-No emissions funding to acquire and maintain low or no emission transit vehicles along with the requisite equipment and infrastructure
- ❖ Continue to ensure that the public transit system adequately connects existing employment, educational institutions, commercial centers, housing concentrations and other primary points of interest within the planning area
- ❖ Evaluate current transit workforce to identify skill gaps and provide appropriate training in order to maintain low or no emission vehicles

### 5.3 Support the Adoption of Electric Vehicles

In recent years, the emergence of electric vehicles has become a national sensation. We have all seen them, but we may not all heard the environmental benefits of electric vehicles. In regard to mitigating air pollutions and greenhouse gas emissions, the advancement of electric vehicles has become another excellent tool. Electric vehicles simply do not directly produce emissions of any sort. They don't even have tailpipes. This means that having more electric vehicles on the road could directly lessen the amount of air pollution and greenhouse gasses emitted at any time. Currently, the number of electric vehicles on the road is fairly low, but the number is increasing steadily. We mentioned in a previous chapter that the Infrastructure Investment and Jobs Act allocated a substantial amount of funding to create a national network of electric vehicle charging stations. It is imperative that we capitalize on newly available funding for electric vehicle infrastructure and make preparations to accommodate and promote the adoptions electric vehicles. Listed below you will find another series of strategies, which promote electric vehicle adoption within the region:

- ❖ Provide clear and accurate signage to direct electric vehicle (EV) users to charging and fueling stations/parking
- ❖ Promote the installation of charging infrastructure at key public areas across the metropolitan planning area (MPA)

- ❖ Lead by example by promoting EV charging stations at local government agencies
- ❖ Support any future attempts to incorporate EVs into local government fleets
- ❖ Educate major employers about the benefits of workplace charging infrastructure and EVs
- ❖ Develop EV infrastructure policy for major new developments and consider the inclusion of EV charging requirement criteria

### 5.4 Continued Improvements and Monitoring

It is the belief of the N.A.R.T.P.C. that the above strategies will help mitigate air pollution and greenhouse gas emissions from gasoline powered vehicles, but the N.A.R.T.P.C. and the region as a whole must remain diligent in order for these efforts to be effective. Listed below are a few final strategies that would help the N.A.R.T.P.C. to monitor and continue to make progress towards lower vehicle emissions:

- ❖ Work with a third-party organization to develop an in-depth emissions inventory for the MPA
- ❖ Create an inventory of all EV charging stations within the MPA
- ❖ Develop and regularly update a public map of all EV charging stations within the MPA
- ❖ Periodically produce reports to generate interest and educate the public on ways to reduce greenhouse gas emissions
- ❖ Conduct/develop additional studies and plans, as needed, to lower the amount of vehicular emissions and improve regional air quality

## LIST OF ACRONYMS

3-C	Continuing, Cooperative, Comprehensive
ACS	American Community Survey
ADA	Americans with Disabilities Act
ADEQ	Arkansas Department of Environmental Quality
ADH	Arkansas Department of Health
ADT	Average Daily Traffic
ARDOT	Arkansas Department of Transportation
ATC	Active Transportation Committee
ATP	Regional Active Transportation Plan
CAA	Clean Air Act
CAC	Citizen Advisory Committee
C.F.R	Code of Federal Regulations
EPA	Environmental Protection Agency
FARS	Fatal Accident Reporting System
FAST	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FY	Fiscal Year
HSIP	Highway Safety Improvement Program
JATS	Jonesboro Area Transportation Study
JET	Jonesboro Economical Transportation System
L RTP	Long Range Transportation Plan (synonymous with MTP)



MAP-21	Moving Ahead for Progress in the 21 <sup>st</sup> Century
MPA	Metropolitan Planning Area
MPO	Metropolitan Planning Organization
MTP	Metropolitan Transportation Plan (synonymous with LRTP)
NAAQS	National Ambient Air Quality Standards
NARTPC	Northeast Arkansas Regional Transportation Planning Commission <b><i>*formerly known as Jonesboro MPO*</i></b>
NHTSA	National Highway Traffic Safety Administration
OAQ	Office of Air Quality
PPP	Public Participation Plan
RTP	Regional Transportation Plan
SAFETELU	Safe, Efficient, Transportation Equity Act: A Legacy for Users
STAR Report	Small Towns and Rural Multimodal Networks
STBGP	Surface Transportation Block Grant Program
TAC	Technical Advisory Committee
TIP	Transportation Improvement Program
TPC	Transportation Policy Committee
TRB	Transportation Research Board
UPWP	Unified Planning Work Program
U.S.C.	United States Code
USDOT	United States Department of Transportation
VMT	Vehicle Miles Travelled

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