Ozarks Clean Air ALLIANCE

2017
Clean Air Action Plan for Southwest Missouri

Serving as the Southwest Missouri Area Path Forward Document for Ozone and PM Advance Programs

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Acknowledgements

The Ozarks Clean Air Alliance (OCAA) would like to thank several groups and individuals for aiding in the development of the Clean Air Action Plan for Southwest Missouri. These OCAA members and other stakeholders reviewed the draft plan prior to completion of the final version. These groups and individuals are listed below:

CAAP Workgroup (OCAA Members)

- **Dave Fraley**, City of Springfield (Chair)
- **Barbara Lucks** (Vice-Chair)
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- Richard Barnes, Missouri Department of Natural Resources
- J. Howard Fisk, Fisk Transportation
- Sara Garretson, City of Springfield
- Daniel Hedrick, City Utilities of Springfield
- David Hutchison, City of Springfield
- Natasha Longpine, Ozarks Transportation Organization
- Zach Miller, Murney Associates, REALTORS
- Suzan Morang, Joplin Health Department
- Doug Neidigh, Mercy Health System
- Tana Pulles, City of Springfield
- Jeff Seifried, Springfield Area Chamber of Commerce
- Andrew Seiler, Missouri Department of Transportation
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- Paul Vitzthum, Missouri Department of Natural Resources
- Ann Wallenmeyer, Springfield Public Schools
- Todd Wiesehan, Christian County

OCAA Member Organizations

- Greene County Highway Department
- J. Howard Fisk Transportation Group
- Missouri Department of Natural Resources
- Missouri State University
- Murney Associates, REALTORS
- Ozarks Green Building Council
- Ozarks Technical Community College
- Partnership for Sustainability
- Rick's Automotive
- Show Me Yards and Neighborhoods
- Southwest Area Manufacturers Association
- Springfield Area Chamber of Commerce
- Springfield-Greene County Health Department
- Springfield Public Schools
- University of Missouri Extension

Other Stakeholder Organizations

- City of Branson
- City of Hollister
- City of Ozark
- City of Nixa
- City of Monett
- City of Joplin Health Department
- College of the Ozarks
- Environmental Advisory Board of Springfield and Greene County
- Environmental Protection Agency
- Jasper County Health Department
- Stone County Commission
- Taney County Health Department
- Taney County Commission

Introduction

The Ozarks Clean Air Alliance serves to guide the region's education and outreach efforts to reduce the negative effects of air pollution. The OCAA brings together vested individuals and both public and private representatives who are dedicated to raising awareness and understanding of today's air quality issues. The OCAA works to create opportunities to voluntarily reduce the emissions that cause air pollution. This section includes information about the establishment of the Ozarks Clean Air Alliance (OCAA) and the research and regulations that guided the design of the Clean Air Action Plan (CAAP).

Ozarks Clean Air Alliance

The Ozarks Clean Air Alliance (OCAA) was created in response to the needs and issues identified in an environmental health assessment conducted in 2002 by the Springfield-Greene County Health Department. The findings of this assessment were assembled into a comprehensive report titled "The State of the Environment for Springfield and Greene County: A Report and Recommendations," which was coordinated through the Community Partnership's Environmental Collaborative and the Environmental Advisory Board. The data and information used in this assessment were compiled through research of both electronic and standard published materials. A great deal of information was also obtained through personal interviews with contacts in many environmental disciplines including population growth and urban sprawl, water quality/quantity, air quality, solid waste management, community health, environmental education, and environmental justice. The full report can be viewed at <www.ozarksenvironment.com>.

This report revealed that before opinion information could be collected from residents, the community needed air quality education. Like other natural resources, the quality of air does not begin or end at the city or county line. Appropriately, the air quality workgroup recommended the establishment of an ongoing regional committee; therefore, the OCAA was created to address air quality issues in the Ozarks region. Additional information can be found on the OCAA website, <www.showmecleanair.com>.

Clean Air Action Plan

The first task of the Ozarks Clean Air Alliance was the development of the Clean Air Action Plan (CAAP). This plan was modeled after the Environmental Protection Agency (EPA) Ozone Flex Program. The initial CAAP sought to capture all efforts to improve air quality already taking place throughout the region; the previous accomplishments listed throughout this document capture these efforts highlighted in the original CAAP. The CAAP was adopted in 2009 and updated in 2010. This update of the Clean Air Action Plan coincides with the timing of the initial goals of the CAAP and will serve as the Path Forward document required as part of the EPA Ozone Advance and PM Advance programs.

National Ambient Air Quality Standards (NAAQS)

The Clean Air Act, which was last amended in 1990, requires the EPA to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. In response, the EPA has set standards for six principal pollutants, including carbon monoxide (CO), lead, nitrogen dioxide, ozone, particulate matter (PM), and sulfur dioxide. The CAAP outlines participation in two EPA programs that function to maintain these standards. The Ozone Advance program addresses ground-level ozone, and the PM Advance program addresses fine particulate matter ($PM_{2.5}$). Participants in both programs are encouraged to implement strategies that address both pollutant types. These programs and their associated pollutants are discussed below. For more information, visit www.epa.gov/ttn/naaqs/criteria.html.

Ozone Advance

Ozone is a gas composed of three oxygen atoms. Ozone can be beneficial or detrimental, depending on where it is found. Ozone is beneficial in the upper atmosphere, because it provides protection from the sun's ultraviolet rays, but it is harmful at ground level and can cause significant adverse health and environmental effects. Ozone does not naturally exist at ground level; it is formed by a chemical reaction between volatile organic compounds (VOCs) and oxides of nitrogen (NO_X) in the presence of sunlight. Emissions from industrial facilities, electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NOX and VOCs. Ozone pollution is of greater concern during the summer months, because strong sunlight and hot weather result in heightened ground-level ozone concentrations. For this reason, ozone season is considered to be between March and October in the Springfield region.

Ozone Advance is a program designed to help areas meet the NAAQS for ground-level ozone. The EPA lists the following goals for the Ozone Advance program:

- Help attainment areas reduce emissions to ensure continued health protection
- Aid areas in maintaining attainment
- Direct available resources toward actions that address ozone problems

In addition to help and guidance from the EPA, participants in this program may also receive additional benefits, such as those listed below:

- Early reductions can generally be accounted for within an eventual State Implementation Plan (SIP) baseline for reductions achieved before the baseline year, or as a control measure for reductions achieved after the baseline year.
- The EPA's Diesel Emissions Reduction Act (DERA) program may provide preferred status to Ozone Advance areas.

In May of 2012, the OCAA, in partnership with the City of Springfield and the Ozarks Transportation Organization, wrote a letter of request to participate in the Ozone Advance program, describing the benefits as the following:

- Reduced ozone and other air pollutants
- Continued healthy ozone levels
- Maintained ozone NAAQS
- Avoided violations of ozone NAAQS that could lead to future non-attainment designations
- Increased public awareness about ground-level ozone as an air pollutant
- Targeted limited resources to address ozone problems quickly

Within one year of the letter date, May 29, 2012, the OCAA had to create a Path Forward letter, which describes the measures and programs an area will implement, along with a schedule for the

implementation of each measure and program selected. According to the EPA, an action plan can be submitted in place of a Path Forward letter; the CAAP serves as this document for the southwest Missouri region. This action plan includes a description of the measures and programs to be implemented, the parties responsible for implementation, how each measure will be implemented, an implementation schedule for each measure and program, and provisions for public and stakeholder involvement. Participation in the Ozone Advance program requires a commitment of five years or longer. The program does not create or avoid any regulatory requirements. More information about the EPA Ozone Advance program can be found on the Ozone Advance website: <www.epa.gov/ozoneadvance/>.

PM Advance

Particulate matter is described by the EPA as a complex mixture of extremely small particles and liquid droplets comprised of a number of components, including acids such as nitrates and sulfates, organic chemicals, metals, and soil or dust particles. $PM_{2.5}$ includes particles that are 2.5 micrometers in diameter and smaller, such as those found in smoke and haze. These particles can be directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries, and automobiles react in the air.

The EPA states that $PM_{2.5}$ concentrations in many cities are affected by a combination of regional and local emissions. While the sources of Ozone precursors, NO_X and VOCs, are easily identifiable, the sources of PM precursors can be much more varied.

PM Advance is a new program that promotes local actions to reduce fine particulate pollution ($PM_{2.5}$) and its precursors in attainment areas, helping these areas maintain the $PM_{2.5}$ NAAQS. Improvements in air quality could do the following:

- Ensure continued health protection over the long term
- Provide state, tribal, and local governments with a cushion against potential future violations of the $PM_{2.5}$ NAAQS
- Position areas to avoid non-attainment designations with respect to any future revised NAAQS
- Enable educated decision-making about control measures and programs that are most appropriate and cost-effective for a given area
- Collect multi-pollutant benefits (for example, reductions of NO_X can lead to lower ambient $PM_{2.5}$ levels, as well as lower ambient ozone levels)

The Ozarks Clean Air Alliance, in partnership with the City of Springfield and the Ozarks Transportation Organization, submit a letter requesting participation in the PM Advance Program. Like the Ozone Advance program, the PM Advance program does not create or remove any existing statutory or regulatory requirements and participants are encouraged to commit for at least one five-year term.

Emissions in the Southwest Missouri Region

The Ozarks Clean Air Alliance currently serves 15 counties: Barry, Barton, Cedar, Christian, Dade, Dallas, Greene, Jasper, Lawrence, McDonald, Newton, Polk, Stone, Taney, and Webster. This region was chosen based on existing planning boundaries with consideration for the location of the air quality monitors for the region. Fourteen of these counties are included within two regional planning commissions: the Southwest Missouri Council of Governments and the Harry S. Truman Coordinating Council. Cedar County was included because it contains an ozone monitor; this monitor is considered to be a background monitor, yet it has days that read higher than the Springfield region. A map of the southwest Missouri region can be seen in Appendix A.

Most strategies in this Plan focus on the Springfield metropolitan area, because the Joplin region is currently developing their own alliance and plan, and only four counties are part of the potential non-attainment area, according to initial modeling. These four counties are Christian, Greene,

Stone, and Taney. Despite this, the OCAA is dedicated to providing education and information to the entire 15-county area. For this reason, the DERA program funding has been made available through the OCAA for entities in all 15 counties.

Southwest Missouri continues to experience substantial growth, as demonstrated in Figure 1, below. Although growth benefits the region in many ways, it also causes negative impacts, such as air pollution, which need to be managed. The goal of the CAAP is to implement proactive and feasible voluntary strategies to protect public health and the environment while sustaining growth in the region.

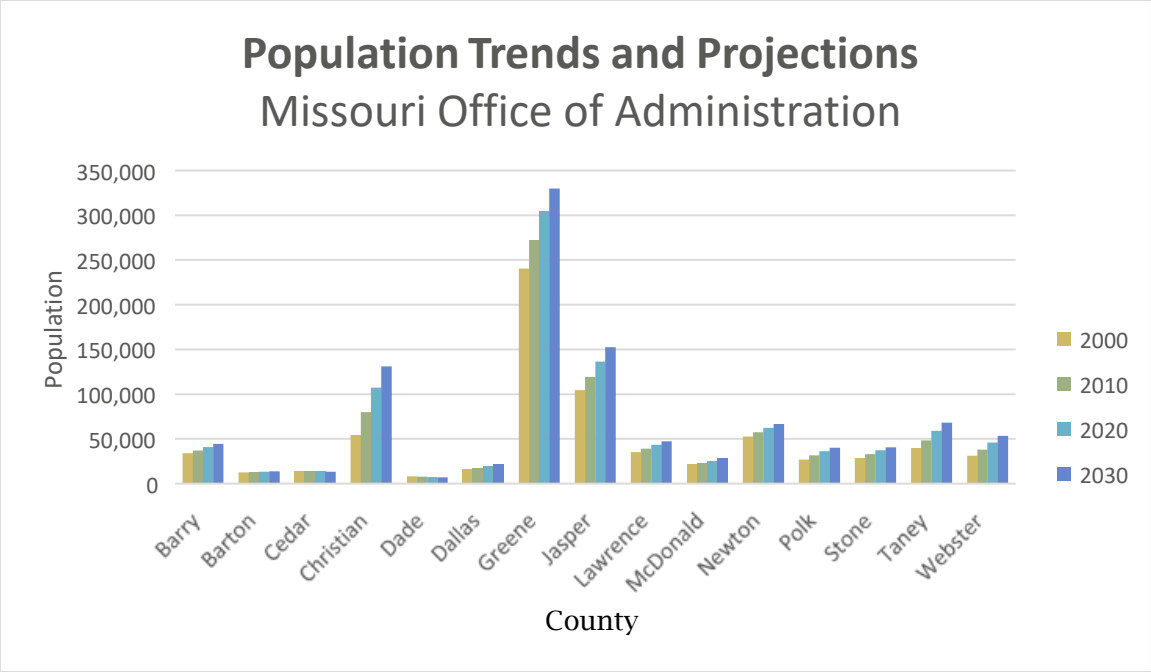

Figure 1. Population Trends and Projections in the 15-County Region Served by the CAAP. This figure shows the significant population growth experienced by most counties between 2000 and 2010, and projects future growth through 2030.

Ground-Level Ozone-Forming Emissions

Emissions of NO_x and VOCs, which can contribute to the formation of ground-level ozone in southwest Missouri, are generated from various sources including motor vehicle emissions, gasoline vapors, chemical solvents, businesses/industrial emissions, power plant emissions, gas-powered off-road equipment, and natural sources. These emissions are typically placed into five categories: area, mobile, non-road, natural, and point sources. Point sources are further broken down into two subcategories: Electric Generating Units (EGU) and Non-Electric Generating Units (Non-EGU). The following is a list of some common examples of air pollution sources for each category:

Electric Generating Units (EGU)

- Power plants

Non-Electric Generating Units (Non-EGU)

- Factories
- Industrial and commercial boilers
- Chemical processing

- Large petroleum storage facilities

Area

- Small businesses (dry cleaners, auto body shops, printers, painting operations, gas stations, etc.)
- Homes (wood combustion, furnaces, paint and solvent use, etc.)
- Office buildings (heating sources, etc.)
- Wildfires
- Waste disposal (landfills)
- Agricultural sources (open burning, pesticide application, tilling, feedlots, etc.)

Mobile

- Cars
- Motorcycles
- Trucks
- Heavy-duty trucks (Semi-tractor trailers, dump trucks, etc.)

Non-road

- Construction equipment (excavators, bull dozers, skid steers, etc.)
- Lawn and garden gasoline-powered equipment (lawn mowers, grass trimmers, chain saws, leaf blowers, chippers, etc.)
- Off-road motorcycles and ATV's
- Golf carts
- Snowmobiles
- Boats
- Farm equipment (tractors, sprayers, balers, etc.)
- Aircrafts

Natural

- Plants and trees (biogenic sources of VOCs)
- Biologic decay (emits NO_x)

Plants and trees provide tremendous benefits including air pollutant removal, oxygen production, and cooling. For this reason, the CAAP does not include strategies to reduce natural sources of air pollution. The CAAP focuses on strategies to reduce emissions from man-made sources of air pollution, only.

The following graphs (Figure 2, Figure 3, and Figure 4) display the tons of NO_x and VOC emissions produced by each man-made source category per county per day in 2011. This data was provided by Missouri Department of Revenue (DNR).

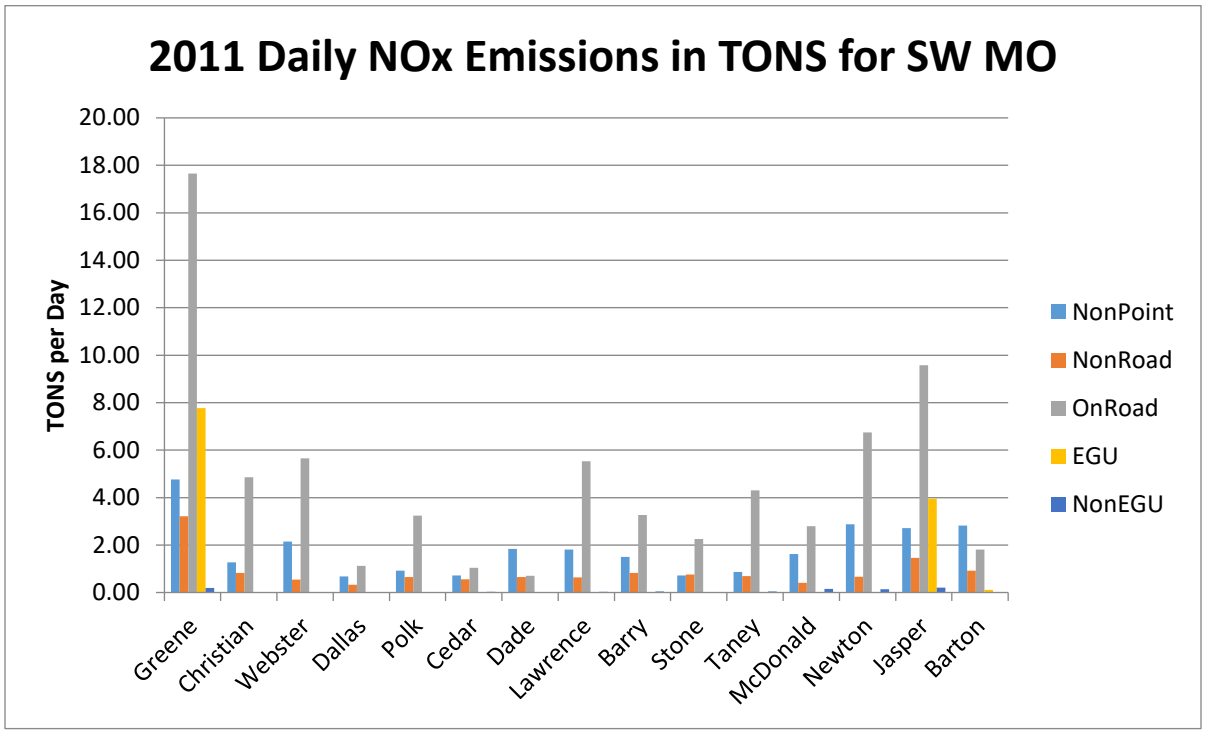

Figure 2. Daily NO_x Emissions in Southwest Missouri in 2011. This graph depicts the amounts of NO_x emissions produced daily by each county in 2011. These emissions are divided into each of the five man-made emissions categories outlined previously. Emissions are measured in tons per day.

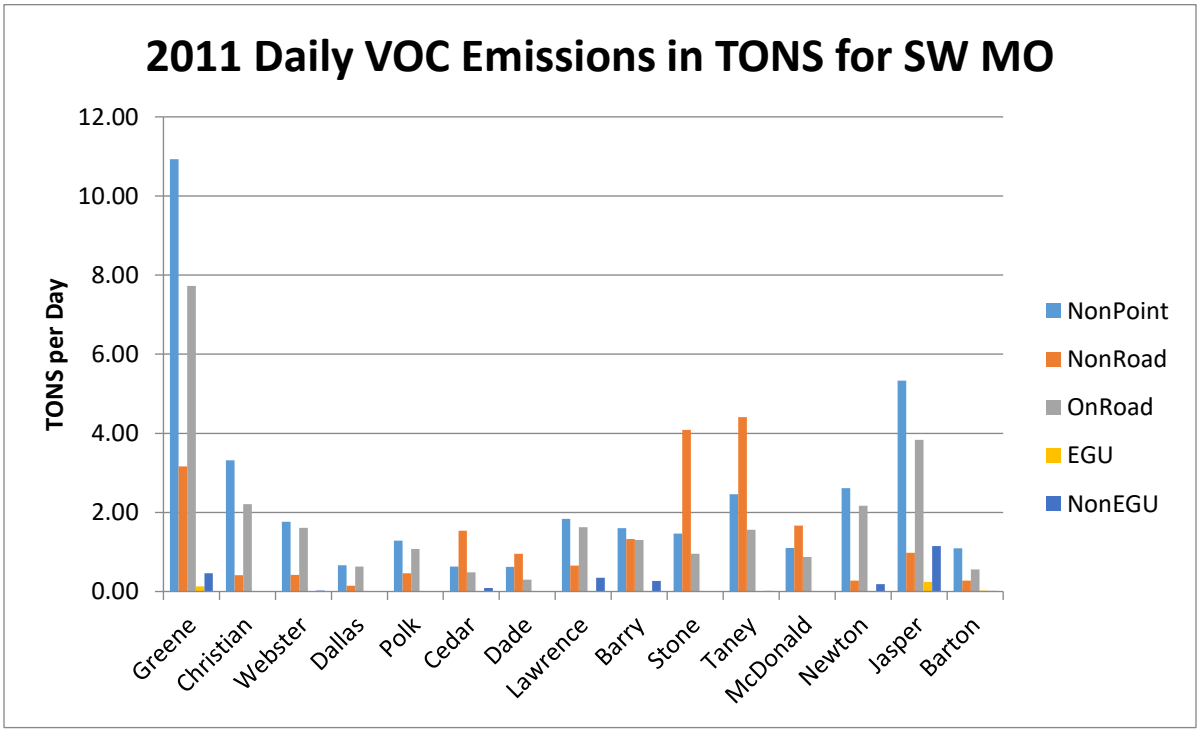

Figure 3. Daily VOC Emissions in Southwest Missouri in 2011. This graph depicts the amounts of VOC emissions produced daily by each county in 2011. These emissions are divided into each of the five man-made emissions categories outlined previously. Emissions are measured in tons per day.

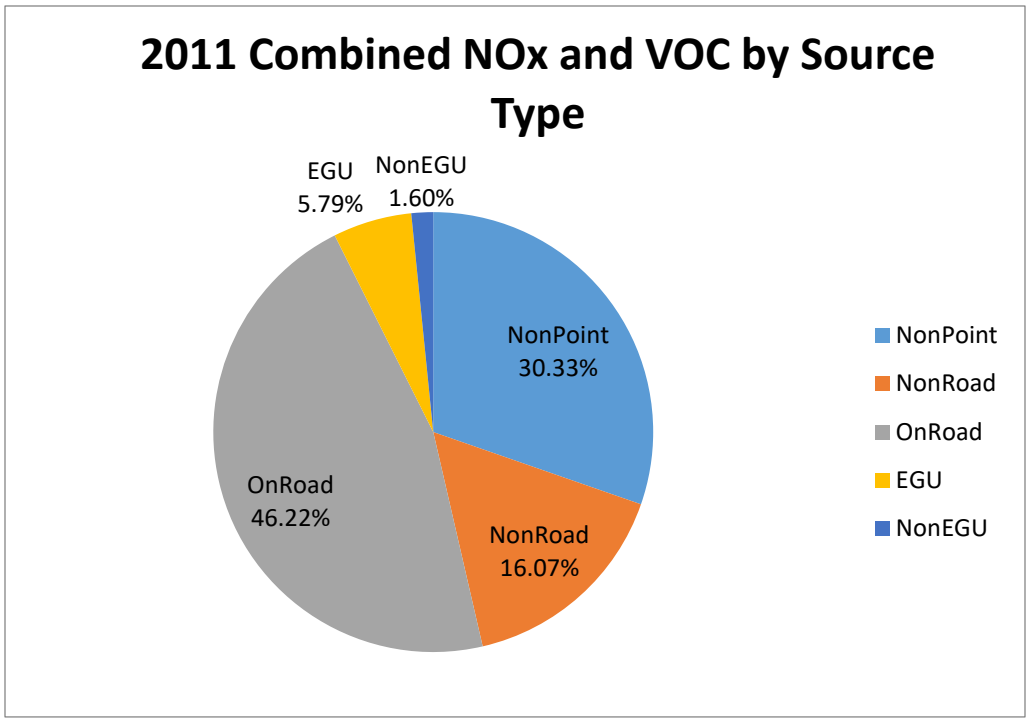

Figure 4. NO_x and VOC Emissions by Source in 2011. This circle totals all emissions in all counties, depicting each man-made source category as a percentage of the whole.

Ozone Design Values

Figure 5, below, displays the design values from ozone monitoring conducted in Greene County from 2003 to 2012. The ozone design value is a three-year average of the fourth-highest 8-hour ozone level for each year. A violation occurs if an area's ozone design value exceeds the 8-hour ambient air quality standard established by the EPA. In March 2008, the EPA lowered the 8-hour standard from 84 parts per billion (ppb) to 75 ppb.

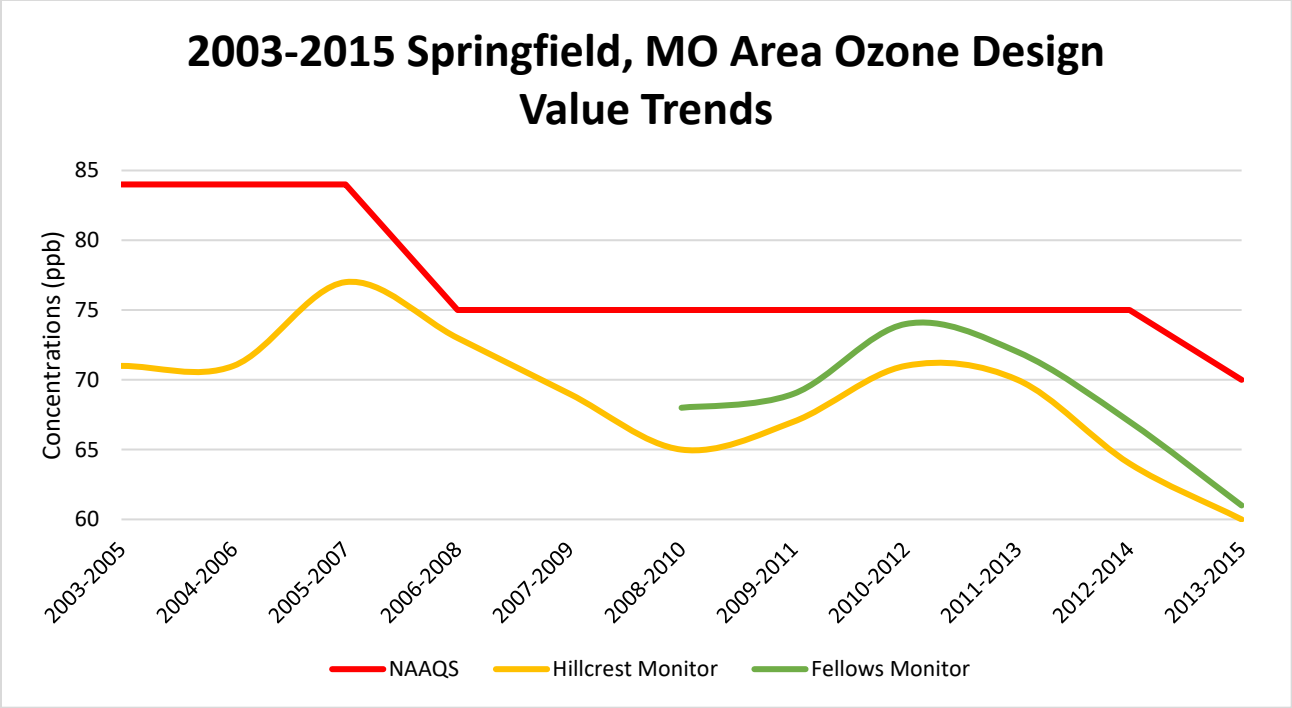

Figure 5. Ozone Design Value Trends in the Springfield, MO Area from 2003 to 2015. One line represents the evolving EPA NAAQ standards, which can be used for comparison with the actual measured values from Hillcrest High School and Fellows Lake. Ozone concentration is measured in parts per billion (ppb).

$PM_{2.5}$-Forming Emissions

Particulate matter emissions in southwest Missouri can come from a variety of sources. In addition to other natural sources, sulfur dioxide, NO_x, and VOC emissions are precursors for PM formation, though their presence cannot be directly correlated to a PM value. Other chemical components of PM include ammonia, organic carbon, and elemental carbon. The southwest Missouri region experiences some seasonality with its $PM_{2.5}$ emissions. In the winter, residential wood burning increases PM values, however, values begin to peak during the summer months as well. Some sources of such emissions are listed below:

Dust

- Road and soil dust
- Biomass burning (agricultural burning and residential wood combustion)
- Construction dust
- Natural source wind erosion

Fuel Combustion

- Electric utility combustion
- Industrial fuel combustion

Mobile

- Diesel and gasoline fueled vehicles
- Friction from components such as tires and brakes

Other sources of PM emissions include industrial processes and solvents. The quantities of $PM_{2.5}$ emissions from each of the listed source sectors produced by each county in 2008, the base year, are depicted graphically in Figure 6, below.

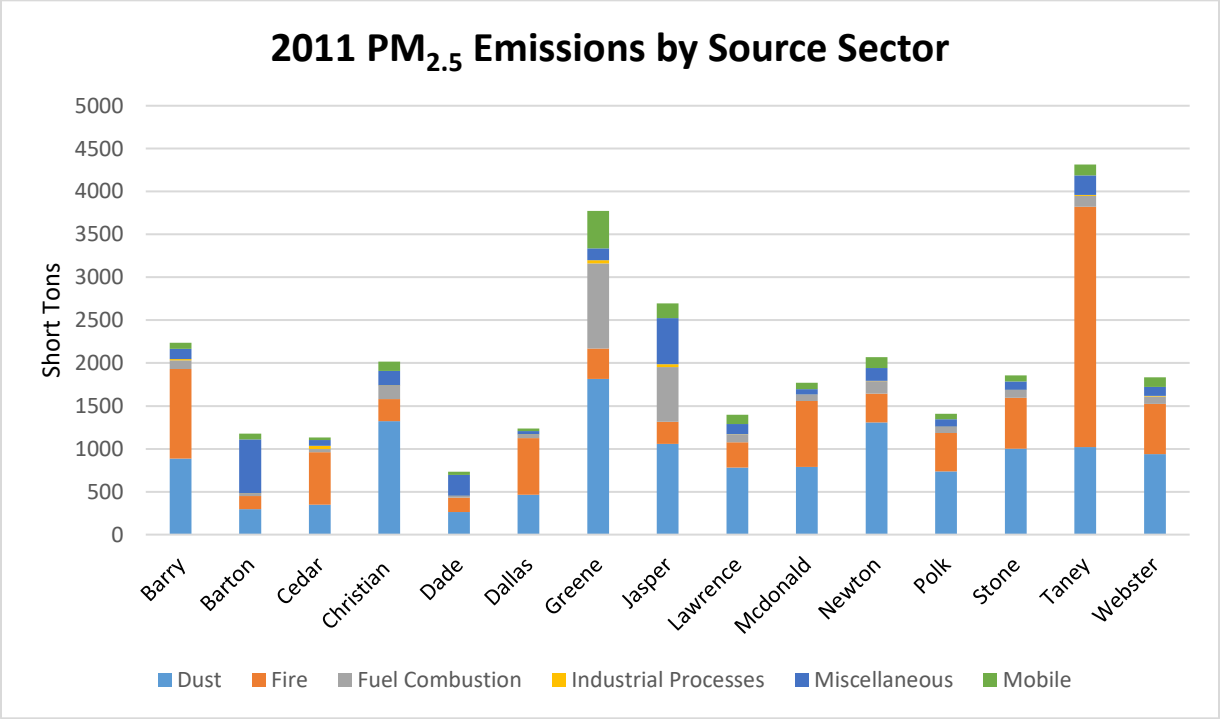

Figure 6. Fine Particulate Emissions by Source Sector in 2011. In this graph, $PM_{2.5}$ emissions, measured in short tons, are divided both by source category and by county.

$PM_{2.5}$ Design Values

Figure 7, found on page 11, displays the design values from $PM_{2.5}$ monitoring conducted in Greene County from 2003 to 2012. The $PM_{2.5}$ design value is based on the average of three consecutive years. A violation occurs if an area's $PM_{2.5}$ design value exceeds the annual average standard established by the EPA. In 2012, the EPA lowered the annual $PM_{2.5}$ standard from 15 $\mu g/m^3$ to 12 $\mu g/m^3$.

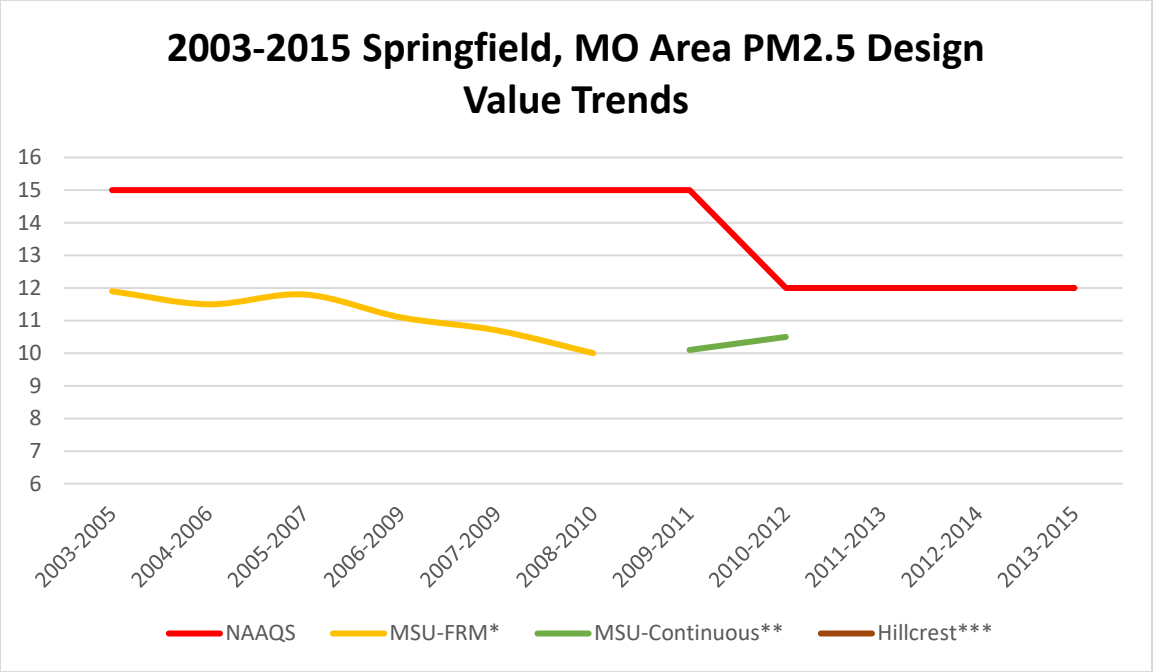

Figure 7. Fine Particulate Matter Design Values in the Springfield, MO Area from 2003 to 2012. One line represents the 2012 EPA standards, which can be used for comparison which the actual measured values from each area. $PM_{2.5}$ concentration is measured in micrograms per cubic meter ($\mu g/m^3$).

Emissions Reduction Strategies

The purpose of the Clean Air Action Plan is to implement viable voluntary strategies that will reduce the formation of ground-level ozone and fine particulate matter. There must be strong support and participation by local governments, industries, organizations, and the public for the program to be successful; organizations and individuals in the region can reduce air pollution by implementing the strategies identified in the CAAP. Although the unavailability of photochemical modeling data prevents the region from quantifying the impacts of many identified strategies, they have been proven effective in other communities. These strategies have been shown to provide public health and environmental protection benefits such as: reduced air pollutants from contaminating surface water; improved community health through encouraging bicycling and walking; conservation of natural resources; reduced dependency on foreign oil; and fiscal savings for individuals, businesses, local governments, and other organizations.

The Ozarks Clean Air Alliance have organized efforts to reduced emissions under the following categories:

- Air Quality Education
- Energy Conservation/Utility
- Transportation
- Technical Assistance
- Citizen Initiatives

Strategies

Strategies have also been defined under each category. These strategies were first outlined with the initial development of the Clean Air Action Plan in 2009.

Air Quality Education

- Educational Tools for Schools
- Scouts and Other Youth Conservation Programs
- Public Service Announcements
- Ozone Alert Messages on Dynamic Message Signs
- Speaker's Bureau
- ShowMeCleanAir.com website
- Ozone Workplace Network Program
- Social Media
- Agricultural Education Program

Energy Conservation/Utility

- Power Plant NO_x Reductions
- Energy Conservation Programs
- Pilot an Innovative Program

Transportation

- Idle Reduction Program
- Diesel Emissions Reduction
- Rideshare Program
- Alternative Transportation and Commute Projects
- Stage I Vapor Recovery
- Intelligent Transportation Systems
- Congestion Management Projects

Technical Assistance

- Educate Counties
- Promote Regulations
- DNR-Specific Technical Assistance

Citizen Initiatives

- Lawnmower Change-Out Program
- Encourage Replacement of Gasoline Powered Equipment with Manual Devices
- Promote Composting Yard Waste

Implemented and Ongoing Activities

Since the inception of the Ozarks Clear Air Alliance in 2007, much work has gone into improving air quality in southwest Missouri, including:

- Regular monthly meetings of the Ozarks Clean Air Alliance with agency updates
- Development of Clean Air Action Plan
- Securing clean air support from member counties
- Supporting DNR during potential non-attainment designation process in 2009
- Reducing Ozone and avoiding non-attainment designation in 2009
- Creating and maintaining Show Me Clean Air website
- Presentations on air quality to area jurisdictions, media, and organizations
- Flag program at local DNR office and into at least one school
- Agreement with MoDOT to use DMSs for awareness on Ozone Orange Days
- Agreement with City Utilities Transit for awareness on Ozone Orange Days
- Idle Reduction policy adopted by OCAA partners
- Springfield Public Schools "school-zone no-idle" program
- Diesel Emissions Reduction Grant assistance and awards (Since 2008, the region has

worked with over 50 organizations making over $6.5 million in clean diesel investments through local, state, and federal contributions.)
- Chadwick Schools conversion of bus fleet to propane
- Air Quality Education curriculum in the Springfield Public Schools, with teacher workshops (materials available for K-5th and 6th–8th grades in all schools with mini-units for homeschoolers)
- Upgrades and emissions reductions by City Utilities power generation
- City Utilities Advanced Metering Program
- Upgrades and emissions reductions by Empire Electric
- Construction of solar facility by City Utilities
- Active transportation projects
- Congestion mitigation projects
- Expanded ITS projects
- Free Electric Car Charging Stations at City of Springfield Offices and in downtown Springfield
- Green features added to Springfield Board of Realtors MultiList Site
- Developed a media outreach plan for air quality education
- Assistance to gas stations which must upgrade equipment to comply with Stage I Vapor Recovery requirements
- Participation in Springfield Integrated Environmental Plan process
- Support for formation of local Clean Air Alliance in Joplin
- Annual recognition of successes and partners in improving air quality through Choose Environmental Excellence awards program

Near Term Goals and Accomplishments

As the Springfield region has continued to improve its air quality, the Ozarks Clean Air Alliance has focused on several specific programs, while also monitoring other efforts in the region which would also improve air quality.

PACE

Greene County has partnered with the Missouri Clean Energy District to implement a Property Assessed Clean Energy (PACE) program, which is a financing tool that allows property owners to borrow money for renewable energy and energy efficiency property improvements with no upfront cost. Initially this was only offered for commercial properties. This has since been expanded to include a residential program called HERO – Home Energy Renovation Opportunity Program.
http://www.mced.mo.gov/

New Rideshare Provider

OzarksCommute.com was implemented in 2009 as a website for facilitating carpool matching to supplement the carpool phone line – (417) 831-RIDE. Just recently, a different provider was chosen. The new website platform includes additional features such as the ability to offer challenges and incentives. The site is already set to be used for the upcoming Move Your Shoes Challenge and Bike to Work Week.
http://www.ozarkscommute.com/

New CU Transfer Station

In May 2016, City Utilities Transit opened a new downtown Transit Center. The new facility provides enhanced safety for passengers, multiple amenities, and will accommodate more larger buses. The goal was to not only improve service for existing passengers, but improve the attractiveness of transit to potential passengers. The Transit Center also has an integrated rain garden system to manage storm water, a renewable energy system, and recycled materials. A streetscape project completed in conjunction with the Center introduced Springfield's first

cycle track, also known as a protected bike lane.
https://www.cutransit.net/

Flag Program
The Air Quality Flag Program is a way for organizations and schools to communicate forecasted air quality levels. The flag colors match the EPA Air Quality Index – green, yellow, orange, red, and purple. When unhealthy days are predicted, organizations and schools can adjust activities to help reduce exposure to air pollution, as well as encourage activities which would reduce emissions.

The regional Missouri Department of Natural Resources Office participates, as do several area schools. Robberson Elementery in Springfield, which is a year-round school, participates and six teachers from outside of Springfield have volunteered to participate in the upcoming year.
https://airnow.gov/index.cfm?action=flag_program.index

Alternative Fuel Infrastructure Plan
The Ozarks Clean Air Alliance is working with the Ozarks Transportation Organization to develop an alternative fuel infrastructure plan, identifying the locations and types of alternative fueling facilities in the region. This will help position the region in applying for relevant corridors to be designated as Alternative Fuel Corridors by the Federal Highway Administration. Currently I-44 across Missouri is identified as an Alternative Fuel Corridor.
https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/

DNR Educator Resources
The Missouri Department of Natural Resources has created a page on their website for Youth Education and Interpretation, providing a resource for students and educators.
https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/

Targeted Paid Advertising
A media campaign, funding by the City of Springfield, Department of Environmental Services for 2016 included:

- Full page, full color ads in “Ozarks Living” magazine
- Rotation on KSMU (Public Radio) on a weekly basis
- Several ads, including PACE promotions in Springfield Business Journal

Automated Metering Infrastructure
City Utilities is upgrading their metering system to an Advanced Metering Infrastructure that will allow for two-way communication of the meters, which will also provide users with up-to-date usage information, allowing them to make smarter choices with their utilities.

CU Automated Metering Infrastructure installations in 2016:

- 17,666 electric meters (over 26,000+ installed over the last two years)
- 584 gas meters (712 total AMI enabled as of 12/9/2016)
- 105 water meters (113 total AMI enabled through 2016)

https://www.cityutilities.net/ami/

2017 Goals
In 2017, the Ozarks Clean Air Alliance will continue to develop the above programs. Additional efforts include the development of a “Stop at the Click” sticker for gas pumps at area fueling stations, finalizing the Alternative Fuel Infrastructure Plan, and working with EPA to determine other activities appropriate for implementation by the Ozarks Clean Air Alliance. Air Pollution levels are at all-time lows and it is the goal of the OCAA to not only maintain those levels, but to continue education the public about air quality concerns in light of such good levels.