

**ALABAMA
PARTNERS
FOR
CLEAN AIR**

www.alabamacleanair.org

**Alabama Partners for Clean Air (APCA)
Voluntary Air Quality Program**

**Annual Activity Report
October 1, 2023 – September 30, 2024**

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APCA Annual Report

October 1, 2023 – September 30, 2024

This document is posted at
<http://alabamacleanair.org>.

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This report was prepared as a cooperative effort of the U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA), the Alabama Department of Transportation (ALDOT), Environmental Protection Agency (EPA), and the Regional Planning Commission of Greater Birmingham (RPCGB), as staff to the MPO, by the requirement of Title 42 USC 7401 et seq., Clean Air Act and 40 CFR Parts 51 and 93, Air Quality Conformity Rules and Regulations. The contents of this report do not necessarily reflect the official views or policies of the USDOT.

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EXECUTIVE SUMMARY

This report comprises activities of the Alabama Partners for Clean Air (APCA) program from October 1, 2023 – to September 30, 2024. The 8-hour ozone standard (0.070 ppm) was effective on December 28, 2015. EPA designated Jefferson and Shelby Counties as attainment of the 8-hour standard and was effective January 16, 2018. The EPA also has the Birmingham area (Jefferson and Shelby Counties and a portion of Walker County) designated as attainment for the 2006 24-hour PM_{2.5} standard (35 µg/m³). Effective April 15, 2015, the EPA designated the Birmingham area as attainment of the 2013 annual PM_{2.5} standard (12 µg/m³). Effective May 6, 2024, the EPA lowered the annual PM_{2.5} standard to 9 µg/m³. Currently, EPA plans on making attainment designations for the new annual PM_{2.5} standard for the data period of 2022-2024. The Birmingham area is currently designated as an attainment of all of EPA's National Ambient Air Quality Standards through calendar year 2023.

A combination of national and state regulatory programs to control emissions and voluntary actions taken by individual citizens and organizations will be required to maintain healthy air quality for the region. While EPA, the Alabama Department of Environmental Management (ADEM), and the Jefferson County Department of Health (JCDH) are responsible for establishing regulatory programs to reduce air pollution in the Birmingham area, APCA takes the lead in implementing voluntary strategies to improve air quality. While regulatory programs focus on industrial emissions, the APCA program focuses on reducing mobile source emissions.

APCA's strategies include:

- A public awareness media advertising campaign, including survey research
- Technical assistance to forecasting agencies and support for the Birmingham Air Quality website
- Distribution of air quality materials at public events and local companies
- Efforts to get area employers and their employees to take part in pollution reduction activities
- Promoting Idle Free Zones at schools
- Science and environmental education outreach to schools
- Alternative fuels program

The media outreach included interviews on local radio and television stations and a media buy on local television stations, print, and digital platforms. Media efforts continued to raise awareness of air quality alert days and the actions the public could take on them.

Expenditure during these 12 months was **\$384,644**. The APCA program documented emissions reductions of 75.35 pounds per day of hydrocarbons, 62.19 pounds per day of nitrogen oxides, and 4.13 pounds per day of PM_{2.5}.

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SECTION 1

AIR QUALITY INFORMATION

MONITORING DATA

Air quality reports were sent out to members of APCA every month. These reports include daily AQI information for all monitored criteria air pollutants in the Birmingham area, a listing of issued alerts, and daily meteorological data. It should be noted that information in these monthly reports was preliminary and was not put through QA/QC procedures.

Below is detailed ozone and fine particulate matter monitoring data used to determine compliance with the Environmental Protection Agency's (EPA) National Ambient Air Quality Standards. The air monitoring data shown in this report is only for 2022. This is because air monitoring data is on a calendar year basis (i.e., January 1, 2022 – December 31, 2022) and this report is based on a fiscal year basis (i.e., October 1, 2023 – September 30, 2024).

OZONE STANDARD

Effective December 28, 2015, EPA lowered the 8-hour ozone standard to 70 parts per billion (ppb). Compliance with the 8-hour standard at each site is determined by a design value of an average of the 4th highest daily 8-hour ozone value at each site over 3 years. The most recent 3-year monitoring period was 2021-2023. The ozone monitoring network comprises 5 monitors in Jefferson County and 1 in Shelby County. The table below displays the design values for ozone at each monitoring site throughout the Birmingham area. For the monitoring period of 2021-2023, no monitors violated the standard.

TABLE 1

8-Hour Ozone Design Values (2021-2023)	
Monitor	Design Value (ppb)
Fairfield	67
Helena	63
Leeds	63
McAdory	63
North Birmingham	68
Tarrant	63

FINE PARTICULATE MATTER (PM_{2.5})

Effective May 6, 2024, the EPA lowered the annual PM_{2.5} standard to 9 µg/m³. A 3-year average of annual means is compared to the annual standard to determine compliance. The 24-hour PM_{2.5} standard is a 3-year average concentration, based on the 98th percentile for each year, and is set at 35 µg/m³. The most recent 3-year monitoring period was 2021-2023. Currently, EPA plans on making attainment designations for the new annual PM_{2.5} standard for the data period of 2022-2024. The fine particulate matter (PM_{2.5}) monitoring network consists of 5 monitors throughout Jefferson County. The tables below display the annual and 24-hour design values for PM_{2.5} at each monitor throughout Jefferson County.

TABLE 2

Annual PM_{2.5} Design Values (2021-2023)	
Monitor	Design Value (µg/m³)
Arkadelphia	9.5
Leeds	8.4
McAdory	8.4
North Birmingham	9.6
Wylam	8.8

TABLE 3

24-Hour PM_{2.5} Design Values (2021-2023)	
Monitor	Design Value (µg/m³)
Arkadelphia	20
Leeds	16
McAdory	18
North Birmingham	20
Wylam	19

AIR QUALITY EXCEEDANCES

Below are tables showing the exceedances of the 8-hour ozone standard from 2014 through 2023 and exceedances of the 24-hour PM_{2.5} standard from 2014 through 2023. Note that the EPA lowered the 8-hour ozone standard in 2015 so there was a lower threshold to violate the standard. The 2 exceedances of the 24-hour PM_{2.5} standard in 2020 were due to the influence of Saharan dust.

TABLE 4
Exceedances of the 8-Hour Ozone Standard for 2014-2023

Station	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Corner	0	0	1	0	0	1	0	0	1	
Fairfield	0	2	2	0	1	7	0	0	0	4
Helena	1	2	4	0	1	3	0	0	1	1
Hoover	0	2	2	0						
Leeds	0	0	1	0	1	1	0	0	0	2
McAdory	0	0	2	0	1	5	0	0	0	2
N. Birmingham	0	4	3	1	2	4	0	1	1	9
Tarrant	0	4	3	1	3	2	1	0	0	5
Total	1	14	18	2	9	23	1	1	3	23

TABLE 5
Exceedances of the 24-Hour Fine Particulate Matter (PM_{2.5}) Standard
for 2014-2023

Station	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Arkadelphia	0	0	0	0	0	0	1	0	0	0
Leeds	0	0	0	0	0	0	0	0	0	0
McAdory		0	0	0	0	0	0	0	0	0
N. Birmingham	0	0	0	0	0	0	1	0	0	0
Wylam	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	0	0	0

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SECTION 2

SUMMARY OF AIR QUALITY FORECASTS AND MONITORED DATA

“Air Quality Alerts” are forecast one to two days before the alert date. JCDH provides PM_{2.5} forecasts year-round, and the Alabama Department of Environmental Management provides O₃ forecasts during the warm season (approximately mid-April to mid-October) every year. The chart below shows a summary of “Air Quality Alerts” that were issued for fine particulate matter (PM_{2.5}) and ozone (O₃) during the period October 2023 – September 2024. “Air Quality Alerts” are forecasted one to two days before the alert date. JCDH provides PM_{2.5} forecasts year-round, and the Alabama Department of Environmental Management provides O₃ forecasts during the warm season (approximately mid-April to mid-October) every year. The information in the column labeled “Actual AQI Color” is from preliminary data and has not been through QA and QC procedures.

TABLE 6
Summary of Alert Days

Date of Alert	Forecast AQI Color	Actual AQI Color	Pollutant
3/21/2024	Orange	Orange	PM _{2.5}
5/1/2024	Orange	Yellow	O ₃
6/12/2024	Orange	Yellow	O ₃
6/13/2024	Orange	Yellow	O ₃
6/14/2024	Orange	Orange	O ₃
6/22/2024	Orange	Orange	O ₃
6/25/2024	Orange	Yellow	O ₃
7/13/2024	Orange	Orange	O ₃

On Air Quality Alert Days, the Regional Planning Commission of Greater Birmingham (RPCGB) staff contacted Birmingham-area media (local television and radio stations and AL.com) to ensure the message was disseminated to the public. The staff used a combination of emails, faxes, and follow-up telephone calls to ensure the media was informed. The RPCGB also contacted the Alabama Department of Transportation to get the alert information on the highway message boards.

Individuals and organizations receive air quality forecasts directly from the U.S. Environmental Protection Agency (USEPA) through an email system called EnviroFlash. Subscribers define whether they want to receive the forecast every day or only when it is above a certain level on the Air Quality Index (AQI), which follows.

**FIGURE 1
AQI Guide**

AQI Values	Levels of Health Concern	Colors
<i>When the AQI Is in this range:</i>	<i>...air quality conditions are:</i>	<i>...as symbolized by this color:</i>
0 to 50	Good	Green
51 to 100	Moderate	Yellow
101 to 150	Unhealthy for Sensitive Groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very Unhealthy	Purple
301 to 500	Hazardous	Maroon

Contracts

As part of the larger Memorandum of Agreement between the RPC and JCDH for FY2024 (October 2023 – September 2024), JCDH had two subcontracts as a participating partner of APCA. The Environmental Monitoring for Public Access and Community Tracking (EMPACT) website, which was re-launched in FY2014 as the “Birmingham Air Quality” website, is maintained by the University of Alabama in Huntsville (UAH). The website provides JCDH, the Alabama Department of Environmental Management (ADEM), and the public with near real-time air quality monitoring data for the Birmingham area. Baron Advanced Meteorological Systems (BAMS) provides air quality forecast model data to JCDH and ADEM. Outreach materials were also a part of the FY2023 budget. The details of JCDH’s budget are shown in the table below.

**TABLE 7
JCDH FY2024 Budget**

	OCT 2023 – SEP 2024
Birmingham Air Quality Website Maintenance by UAH	\$18,200
BAMS Subscription Meteorological Service	\$48,000
Outreach Giveaways	\$5,800
Total	\$72,000

SECTION 3

PROGRAM BUDGET SUMMARY

The APCA Voluntary Air Quality Program is funded primarily with federal Congestion Mitigation-Air Quality (CMAQ) dollars. Federal funds can pay up to 80 percent of the program expenditures; the remaining 20 percent must be covered with local matching monies.

The Jefferson County Department of Health is a continuing funding partner. The contract partners, Alabama Clean Fuels Coalition, Advanced Consulting, LLC., and The Johnson Management Group, provide the 20 percent match for their programs.

**TABLE 8
Air Quality Program Budget Summary for October 2023 – September 2024**

Program Area	Total Budget	Amount Invoiced (Includes match \$)
Promotional Items / Print Material-RPC*	\$15,000	\$2,985.02
Media Buy-RPC**	\$36,750	\$35,245.01
Employer/Employee Outreach- Advanced Consulting	\$50,000	\$49,772.29
Idle Free Zones / School Education - Johnson Group	\$71,250	\$52,113.65
Clean Cities/Alternative Fuels and Diesel Retrofits- ACFC	\$260,000	\$17,871.95
EMPACT/Forecasts- JCDH	\$72,000	\$71,714.21
Program Administration- RPC***	\$150,000	\$154,941.46
Total	\$655,000	\$384,643.59

*Promo/print materials, website, sponsorships, etc.

** Creative Directions & Media Buy

*** All staff time and Public Relations

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SECTION 4

MARKETING/PUBLIC OUTREACH

Air quality forecasts are issued every day of the year for the Birmingham area and are based on the Air Quality Index (AQI). An Air Quality Alert is issued when the AQI is forecast to reach 101 or higher. The public is encouraged to decrease their emissions on days with higher pollution levels. In the summer of 2024, the Jefferson County Department of Public Health issued 8 Air Quality Alert Days. On Air Quality Alert Days, media releases were sent to local television and radio stations in addition to Al.com. This list of local contacts was updated for accuracy. Media releases are sent the day before an Air Quality Alert is issued.

The marketing outreach campaign started with Air Quality Awareness Week in May and continued with a media campaign that launched on July 7th and continued through August 4, 2024. This period was selected because it falls in the peak date range for Air Quality season. The campaign was featured on television and in print.

The television messages featured the theme, “Everyone Can Help!” Two 15-second commercials were utilized to provide additional frequency for the messages. These messages provided simple things everyone can do to help keep the air clean. The design was also used in print and digital ads, combining bright blue and yellow colors to make the ads stand out. The same message and ad design were used across all media platforms.

Air Quality Awareness Week

Each year, the Alabama Partners for Clean Air utilizes Air Quality Awareness Week to raise awareness of air quality issues. This year, the theme was “Know Your Air.” Throughout the week of May 6-10, local media outlets promoted ways that individuals can help make the air cleaner by doing small things that collectively make a big difference.

**FIGURE 2
WBRC Fox 6 Interviews**



The media outreach kicked off on May 3, the Friday before Air Quality Awareness Week, with a series of interviews aired on WBRC-TV's Good Day Alabama. Jeh Jeh Pruitt conducted the interviews at Railroad Park, and local APCA partners were featured, including Matt Lacke, Meteorologist, Jefferson County Department of Public Health, Jeniese Hosey with CommuteSmart, and Michael Staley with the Alabama Clean Fuels Coalition. These partners shared ways to help keep the air clean, including combining errands, carpooling, and driving electric vehicles.

FIGURE 3
WBRC Fox 6 Interview



Following local news, WBRC-TV's First Alert Weather Extra airs weekly from 6:30 p.m. to 7:00 p.m. Each evening during Air Quality Awareness Week, WBRC-TV focused on different topics related to Air Quality. Meteorologist Wes Wyatt and his weather team provided in-depth coverage of the daily issues associated with Air Quality Awareness Week.

- Monday, May 6 -Controlled Burns
- Tuesday, May 7 – Asthma and Air Quality
- Wednesday, May 8 – How is Air Quality measured
- Thursday, May 9 - How AQI index is changing
- Friday, May 10 - Air Quality and the ecosystem

Links to the segments:

May 6 <https://www.youtube.com/watch?v=kVgil3TaUMM>

May 8 <https://www.youtube.com/watch?v=NGpr7nyQy3g>

May 9 <https://www.youtube.com/watch?v=s2hI1J9nkg8>

May 10 <https://www.youtube.com/watch?v=BnoehMz5Wtw>

FIGURE 4
WBMA Talk of Alabama Interview



Matt Lacke appeared on Talk of Alabama on May 6, 2024. This local talk show airs weekly from 9 am to 10 am on WBMA-TV (ABC33/40). This interview delivered 8,200 viewers.

Here is a link to the segment:

<https://www.abc3340.com/station/talk-of-alabama/talk-of-alabama-562024>

FIGURE 5
Birmingham Mountain Radio Interview



On Tuesday, May 7th, Matt Lacke was interviewed by Will Lochamy on Birmingham Mountain Radio’s morning program, The Morning Blend. This local radio station has a high concentration of “environmentally friendly” listeners, a very targeted audience for the air quality awareness message. This interview reached approximately 750 listeners.

In addition to the interviews during Air Quality Awareness Week, WIAT-TV CBS42 re-aired a 2-minute news segment featuring Alabama Partners for Clean Air partners, CommuteSmart, and the Alabama Clean Fuels Coalition. This interview aired on the CBS42 Morning News on Saturday, August 3, 2024.

TABLE 9
Media Interview Impressions

Day/Date	Station	Program	Topic	Viewers/Listeners
Fri. 5/3/24	WBRC-TV	Good Day Alabama	Air Quality Awareness	48,900
Fri. 5/3/24	WBRC-TV	Good Day Alabama	ACFC-Electric Vehicles	48,900
Fri. 5/3/24	WBRC-TV	Good Day Alabama	CommuteSmart-Carpool	47,100
Mon.5/6/24	WBMA-TV	Talk of Alabama	Air Quality Awareness	8,200
Mon.5/6/24	WBRC-TV	First Alert Weather Extra	Controlled Burns	38,000
Tue. 5/7/24	BMR	Morning Blend	Air Quality Awareness	750
Tue. 5/7/24	WBRC-TV	First Alert Weather Extra	Asthma & Air Quality	38,000
Wed. 5/8/24	WBRC-TV	First Alert Weather Extra	How is Air Quality Measured	38,000
Thur. 5/9/24	WBRC-TV	First Alert Weather Extra	How AQI Index is changing	38,000
Fri. 5/10/24	WBRC-TV	First Alert Weather Extra	Air Quality and ecosystem	38,000
Sat. 8/3/24	WIAT-TV	CBS42 Morning News	CommuteSmart & EV's	2,400
TOTAL				346,250

AIR QUALITY FORECASTS

Local television partners, WBRC-TV FOX6 and WIAT-TV CBS42, included Air Quality Forecasts in their local weather reports to help raise awareness of Air Quality Alert Days. (screenshots from Air Quality Forecasts)

TABLE 10
WBRC Fox 6 Digital Delivery

Station	# of spots	Impressions	Added Value Description	Added Value
WBRC-TV	104	3,333,100		
WBRC-TV			Air Quality Forecast- 35X @ \$150 each	\$5,250.00
WBRC-TV		144,900	3 Interviews on Good Day AL	\$4,500.00
WBRC-TV		190,000	5 News features-First Alert	\$7,500.00
Total	104	3,668,000		\$17,250.00

TABLE 11
BOUNCE TV Digital Delivery

Station	# of spots	Impressions	Added Value Description	Added Value
BOUNCE	100	100,000	paid a reduced rate of \$5 each (value of \$15)	\$1,000.00

TABLE 12
CBS42 TV Digital Delivery

Station	# of spots	Impressions	Added Value Description	Added Value
WIAT-TV	142	1,092,600	14 at no charge (value of \$50)	\$700.00
WIAT-TV		2,400	Living Local Segment	\$500.00
WIAT-TV			Air Quality Forecast 35X @ \$75 each	\$2,625.00
Total	142	1,095,000		\$3,825.00

TABLE 13
ABC3340 TV Digital Delivery

Station	# of spots	Impressions	Added Value Description	Added Value
WBMA-TV	78	919,500	30 spots at no charge (value of \$50)	\$1,500.00
WBMA-TV		8,200	Interview on Talk of Alabama	\$750.00
TOTALS	78	927,700		\$2,250.00

TABLE 14
WABM TV Digital Delivery

Station	# of spots	Impressions	Added Value Description	Added Value
WABM-TV	30	150,900	12 spots at no charge (value of \$30)	\$ 360.00

Print and Digital

The website alabamacleanair.org provides information and helpful tips for consumers to help find ways to keep the air clean. The campaign promoted the website through television messages, media interviews, and pledge cards.

The Birmingham Times Media Group, Inc. The Birmingham Times is a weekly newspaper distributed throughout Jefferson County, with a focus on the African American community. Two quarter-page full-color ads ran on 7/11 and 7/2. In addition to the discounted rate for the ads, BT Group featured weekly digital ads on www.birminghamtimes.com.

Total Added Value: \$500

TABLE 15
Marketing Campaign Overview

Media Platform	Total # of ads	Impressions	Added Value
WBRC-TV	104	3,668,000	\$ 17,250.00
BOUNCE	100	100,000	\$ 1,000.00
WIAT-TV	143	1,095,000	\$ 3,825.00
WBMA-TV	78	927,000	\$ 2,250.00
WABM-TV	31	150900	\$ 360.00
Digital/Print			
Birmingham Times	2	40,000	\$ 500.00
Total Added Value	458	5,980,900	\$ 25,185.00

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SECTION 5

EMPLOYER/EMPLOYEE OUTREACH

Advanced Consulting, LLC., working with the APCA on business and community outreach, developed programs to expand education on air quality issues in Jefferson and Shelby Counties. This synopsis breaks down many avenues of outreach and information received from corporations, cities, and other groups.

From October 2023 to September 2024, Advanced Consulting continued to work on keeping and building relationships with current corporations. They also worked on getting the message out to the community through community events and programs.

Advanced Consulting spoke to and attended 96 community events. Advanced Consulting also had 6,746 pledge cards signed

Community Events

<u>DATE</u>	<u>EVENT</u>	<u>ATTENDEES</u>	<u>PLEDGE CARDS</u>
October 2023			
Oct 3	Shelby County Night Out	300	67
Oct 3	Titusville Comm Resource	100	38
Oct 5	Birmingham Library Resource Day	200	59
Oct 7	Concord Country Market	200	62
Oct 10	Calera Night Out	200	40
Oct 12	First Baptist Church Health Fair	200	91
Oct 14	Hay Hoover	400	133
Oct 14	Zion Star Health Fair	200	78
Oct 21	Pepper Place	500	128
Oct 28	Montevallo Art Stalk	500	112
Oct 29	Barking at the Moon/Fultondale	300	104

DATE	EVENT	ATTENDEES	PLEDGE CARDS
November 2023			
Nov 1	Archwell HF Roebuck	100	44
Nov 6	Senior Citizen Extravaganza	200	82
Nov 9	Homewood Senior Health Fair	100	29
Nov 17	Alzheimer's Vent	100	49
December 2023			
Dec 2	Cahabazaar Holiday Market	500	103
Dec 6	Titusville Senior Resource	100	59
Dec 7	Know & Grow Senior HF	100	33
Dec 13	Senior Holiday Cheer	300	108
January 2024			
Jan 3	Titusville HF	100	29
Jan 27	First Baptist Church HF Tarrant	200	77
Jan 30	Birmingham Library Expo	100	42
February 2024			
Feb 7	Titusville Senior Resource	100	24
Feb 21	Archwell Five Points West	100	49
March 2024			
March 2	Cahaba Night Bazaar	300	78
March 9	Helena Spring Market	200	81
March 23	Fairfield Health Fair	100	77
March 30	Birdsong Farmer's Market	100	36

DATE	EVENT	ATTENDEES	PLEDGE CARDS
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April 2024

April 2	Archwell Spring Health Fair	100	33
April 3	Titusville Resource Day	100	21
April 5	Reg Library & Arts Council	200	73
April 6	Reg Library & Arts Council	200	48
April 13	Concord Community Market	200	49
April 14	Paws in the Park	200	76
April 17	Birmingham Library Recovery Prog	200	62
April 20	Birmingham Health Fair/ Crossplex	200	63
April 20	Pepper Place	500	98
April 24	Senior Picnic	300	124
April 26	Ms. Senior Jefferson County	300	82
April 26	Pinson Farmer's Market	100	49
April 27	Celebrate Trails	300	112
April 27	Health & Wellness Fairfield	100	50

May 2024

May 2	Woman's Health Archwell Midfield	100	43
May 4	Eastlake Farmer's Market	100	33
May 4	Shelby County Trade Day	200	49
May 8	Titusville Senior Resource Day	100	29
May 11	Cahaba Brewery Mother's Day Event	300	102
May 16	Know & Grow	200	83

DATE	EVENT	ATTENDEES	PLEDGE CARDS
May 17	Mindful May/ Norwood Library	100	49
May 18	Off the Beaten Path Pop UP	200	78
May 25	Birdsong Farmer's Market	100	48
May 30	Leeds Farmer's Market	100	37
May 31	Ross Bridge Farmer's Market	200	87
June 2024			
June 1	Trussville Farmer's Market	200	61
June 1	Walkathon Fairfield	200	66
June 2	Vulcan Birthday Bash	500	112
June 4	Men's Health Fair Archwell	100	49
June 5	Titusville Comm Resource Day	100	58
June 7	Ride the Dixie Railway	500	300
June 7	Columbiana Farmer's Market	100	32
June 8	Eastlake Fishing Rodeo	300	103
June 8	Eastlake Farmer's Market	100	22
June 10	Montevallo FM	100	50
June 11	Trussville FM	100	28
June 15	Valleydale FM	100	48
June 18	Homewood FM	200	53
June 21	Ross Bridge FM	200	58
June 22	Cahabazaar	300	106
June 27	I Love America Night	500	124

DATE	EVENT	ATTENDEES	PLEDGE CARDS
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July 2024

July 3	Titusville Senior Resource Fair	100	39
July 6	Bessemer FM	100	48
July 8	Montevallo FM	100	41
July 9	West Homewood	200	56
July 12	Pinson FM	100	36
July 20	Back to School / Columbiana	100	58
July 23	West Homewood FM	100	44

August 2024

Aug 6	West Homewood Night Out	200	63
Aug 6	Harpersville Night Out	100	39
Aug 7	Titusville Resource Day	100	22
Aug 10	Roosevelt City Back to School	200	77
Aug 10	Bessemer FM	100	48
Aug 14	AARP Healthfair	100	52
Aug 17	Alabaster City Health Fair	300	192
Aug 17	Helena FM	200	59
Aug 17	Cahaba Night Bazaar	300	103
Aug 24	Health Fair at Seventh Day Adventist	100	42
Aug 30	Back to School Rally/Titusville	100	53
Aug 31	Bessemer FM	100	46

DATE	EVENT	ATTENDEES	PLEDGE CARDS
September 2024			
Sept 4	Titusville Senior Expo	100	38
Sept 7	Pepper Place	500	104
Sept 13	Fall into Wellness	200	101
Sept 14	Wellness/Safety Expo Bessmer	100	53
Sept 17	Children's Hospital Health Fair	700	400
Sept 21	Paw Palooza	200	68
Sept 24	Trussville FM	100	21
Sept 28	Harpersville Day	300	83

SECTION 5

SCIENCE AND ENVIRONMENTAL EDUCATION OUTREACH

Johnson Management Group (JMG) conducted, facilitated, and attended neighborhood meetings, church social events, community and school events to share the air quality message.

JMG conducted 59 audits between October 2023 and September 2024.

The following schools were included: Martha Gaskins, Oxmoor Valley, Huffman Middle, West End Academy, Holy Family, Advent, Ephesus Academy, Midfield Elementary, Hayes, Cornerstone, Center Point, Barrett, Robinson, Washington, Glen Iris, Epic, Rutledge, Homewood Middle, Pleasant Grove Elementary, Edgewood, Hemphill, Parker, Clay Elementary, Wilkerson, Bryant Elementary, Jonesboro, Clay Chalkville, Central Park, Phillips Academy Homewood, Rudd, Bumpus, Hoover Christian, Deer Valley, Princeton, Jackson Olin, Lipscomb, Hudson, CJ Donald, Glen Oaks, Minor, Carver, Ramsay, Minor Community, Erwin Middle, Tarrant Elementary, Sun Valley, Leeds High, Green Acres, Inglenook, Woodlawn, Wylam, Gardendale, Tarrant High, Jones Valley, Martha Gaskins, Tarrant.

The audits yielded 6,673 pieces of APCA literature being handed out and 1,948 cars shutting off because of the message to turn the key and be idle-free.

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SECTION 7

CLEAN CITIES/ALTERNATIVE FUELS

This report summarizes the activities and accomplishments of the Alabama Clean Fuels Coalition, Inc. (ACFC) as a participating partner in the Alabama Partners for Clean Air (APCA) Voluntary Air Quality Program (the Program). The report includes ACFC activities and accomplishments related to alternative fuel, diesel retrofit, and APCA Program support activities during the reporting period for the following program areas:

1. Promoting and facilitating the use of alternative fuels and the installation of alternative fuel infrastructure in Jefferson and Shelby Counties
2. Creating “alternative fuel corridors” that traverse the Birmingham Region.
3. Participating in the U.S. Department of Energy Clean Cities Program as a designated coalition for the region.
4. Identifying needs and soliciting proposals for financial assistance to install alternative fuel infrastructure and retrofit diesel vehicles in Jefferson and Shelby counties.
5. Providing the RPC/MPO technical assistance and review of APCA program monitoring and evaluation, compiling data on the allocation of CMAQ funds and expected air quality benefits.
6. Undertaking outreach efforts to promote alternative fuel infrastructure programs and assisting the APCA partnership in implementing program goals, objectives, promotions, and activities in various community sectors in Jefferson and Shelby Counties.

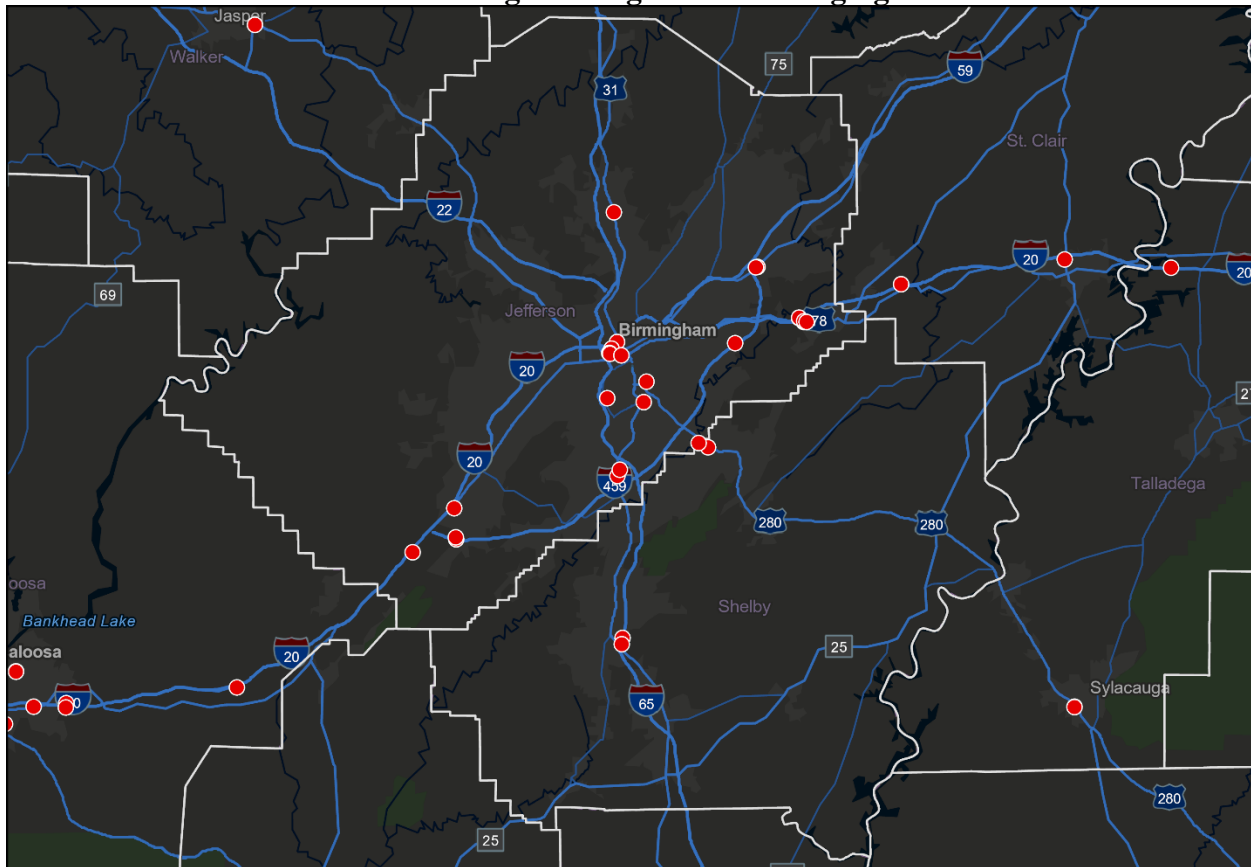
During FY2024, alternative fuel usage in Jefferson and Shelby Counties totaled 3,869,464 gallons or GGEs (gasoline gallon equivalent). This included approximately 84,002 gallons of E85 Ethanol, 168,916 GGE of Propane Autogas, 1,283,831 GGE of CNG, and 2,329,635 GGE of electricity, representing about 53.0 million electric miles driven (BEV and PHEV). These cleaner burning fuels and idle reduction technologies provide emission reduction benefits to the region. In addition, previously completed ACFC diesel retrofit projects provided ongoing emissions reduction benefits for Jefferson and Shelby Counties during this reporting period.

Transportation-related alternative fuel usage in the region increased by approximately 6.46% from FY2023, attributable to increased use of electricity, propane, and CNG for transportation fuel. Local fleets using alternative fuels during this reporting period included the City of Birmingham (E85, Propane, Electricity), Major’s Management (E85 Ethanol), the Birmingham-Jefferson County Transit Authority (CNG), Alabama Power Company (Electricity), Groome Transportation (Propane), Melton Automotive (CNG), Birmingham City Schools (Propane), Waste Management (CNG), and Lampton Love (Propane)

During the reporting period, ACFC remained active in promoting the use of public retail stations in Jefferson and Shelby counties that offer alternative fuels for sale to the public. E85 Ethanol is available in Jefferson County at the Dogwood Shell in Vestavia Dynamite Performance in Warrior and Shelby County at the RaceTrac in Alabaster. CNG at the Birmingham-Jefferson County Transit Authority continues to fuel its fleet at a private CNG refueling station in Birmingham.

However, public access is no longer available. LNG continued to be available throughout the reporting period at the Clean Energy Fuels station on Daniel Payne Drive; however, as a matter of corporate policy, the company would not provide fuel usage information for this station, which exceeded 50,000 GGEs in previous years. Although we estimate usage at this station in FY2022 to be consistent with previous years, no LNG volumes have been included in the alternative fuel usage totals reported herein for Jefferson and Shelby Counties. As indicated on the map included below, EV charging is available at a growing number of public and private charging stations located in the region. U-Haul dispensed propane at its locations in Jefferson and Shelby Counties.

FIGURE 6
Picture of Birmingham Region Fast Charging Station



For the most current list of publicly accessible electric vehicle charging station locations, visit the Alternative Fueling Station Locator on the Alternative Fuels Data Center (AFDC) website at <http://afdc.energy.gov>.

A link directly to the AFDC page showing Alabama EV chargers is below.
https://afdc.energy.gov/stations#/analyze?country=US®ion=US-AL&tab=station&fuel=ELEC&show_map=true

The Alabama Clean Fuels Coalition partnered with several entities on projects to install publicly accessible electric vehicle charging infrastructure projects in 2023. Those Level 2 EV charging projects continue to operate in Birmingham and Montevallo.

ACFC remained very active in promoting alternative transportation fuels in the Birmingham region.

ACFC partnered with Alabama Power and Drive Electric Alabama on the “Drive Electric Alabama Podcast,” launched on April 17, 2024. Michael Staley was a co-host of the multi-episode series that brought listeners EV-related insights from the following:

- Kenneth Boswell, Director, Alabama Department of Economic and Community Affairs
- Houston Smith, Vice President of Governmental Affairs, Alabama Power
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- Mike Oatridge, Executive Director, Alabama Mobility and Power Center
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- Greg Canfield, Former Secretary, Alabama Department of Commerce
- Blair King, Business Development Director, Alabama Power Company
- Dion van Leeve, Vice President Engineering Commercial Vehicles, Autocar Trucks
- David Nethercut, Electric Vehicle Program Manager, Transportation South

FIGURE 7
WBRC Fox 6 Interview



ACFC, along with other APCA partners, participated in a live TV segment on May 3, 2024, at Railroad Park. ACFC President Michael Staley spoke about electric vehicles.

During 2024, ACFC facilitated multiple meetings and discussions about first responder training and safety related to EVs. State Senator Gerald Allen highlighted some of the results of and need for ACFC’s work in this area in an op-ed published by AL.com on May 8, 2024.

ACFC was heavily involved in the planning and execution of the 2024 Drive Electric Alabama EV Summit, which was held at the BJCC on August 14 and 15, 2024 and attended by over 400 people.

ACFC organized EV showcases in Birmingham at Pepper Place Market on April 27 and September 28. These events brought about 80 electric vehicle owners to the market, where they interacted with non-EV owners about their experience driving electric. These events are very impactful, and we’ve had more than one person tell us they purchased an EV after talking to an EV owner at one of our EV showcases.

FIGURE 8
EV Pepper Place Market Event



ACFC welcomed a new Executive Director, Casey Foster, in 2024. Mr. Foster was a school bus fleet manager until he took on this new role. In his previous roles, he has experience implementing propane Autogas school buses. Casey’s experience is an asset to ACFC because he makes ACFC better equipped to talk to other fleets from someone who’s been in their shoes. Casey has successfully conducted outreach to school systems and other fleets to discuss the benefits of transitioning to alternative transportation fuels. Casey will increasingly represent ACFC as a partner to Alabama Partners for Clean Air. Going into 2025, ACFC will share Michael Staley’s new Chevrolet Silverado EV in the community, and Casey will drive a propane autogas-powered Ford F-150.

ACFC works closely with the State of Alabama and other stakeholders to support EV infrastructure planning and awareness efforts. To learn more, review the plan, or provide public input, please visit <https://adeca.alabama.gov/ev/>.

SECTION 8

DOCUMENTED EMISSIONS REDUCTION

**TABLE 16
Emission Reductions by Program from October 1, 2023, to September 30, 2024**

TIP FY2023 CMAQ Ozone Program Project Potential Emissions Reductions						
#	Project	Emissions, lbs./Day			# of	Note
		VOC	NOx	PM _{2.5}	Days	
1	Marketing/Public Outreach/Surveys including Employer/Employee Outreach, the Policy Exchange Foundation, and Jefferson County Department of Health Air Quality Alert	0.968	0.769	2.745	260	FY 2023
2	Clean Cities/Alternative Fuels-Hoover, Birmingham, BJCTA, ALDOT, and other Alternative Fuel Stations	70.281	58.323	1.206	365	Ethanol(E85), Compressed Natural Gas (CNG), and Electricity
3	Idle Free Zone-UWCA/Johnson Group	4.101	3.095	0.183	180	weekdays
	Maximum Daily Emissions Reductions	75.350	62.188	4.134	365	lbs. per day

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Appendix A
Alabama Clean Fuels Coalition
Annual Report

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LEAN CITIES/ALTERNATIVE FUELS

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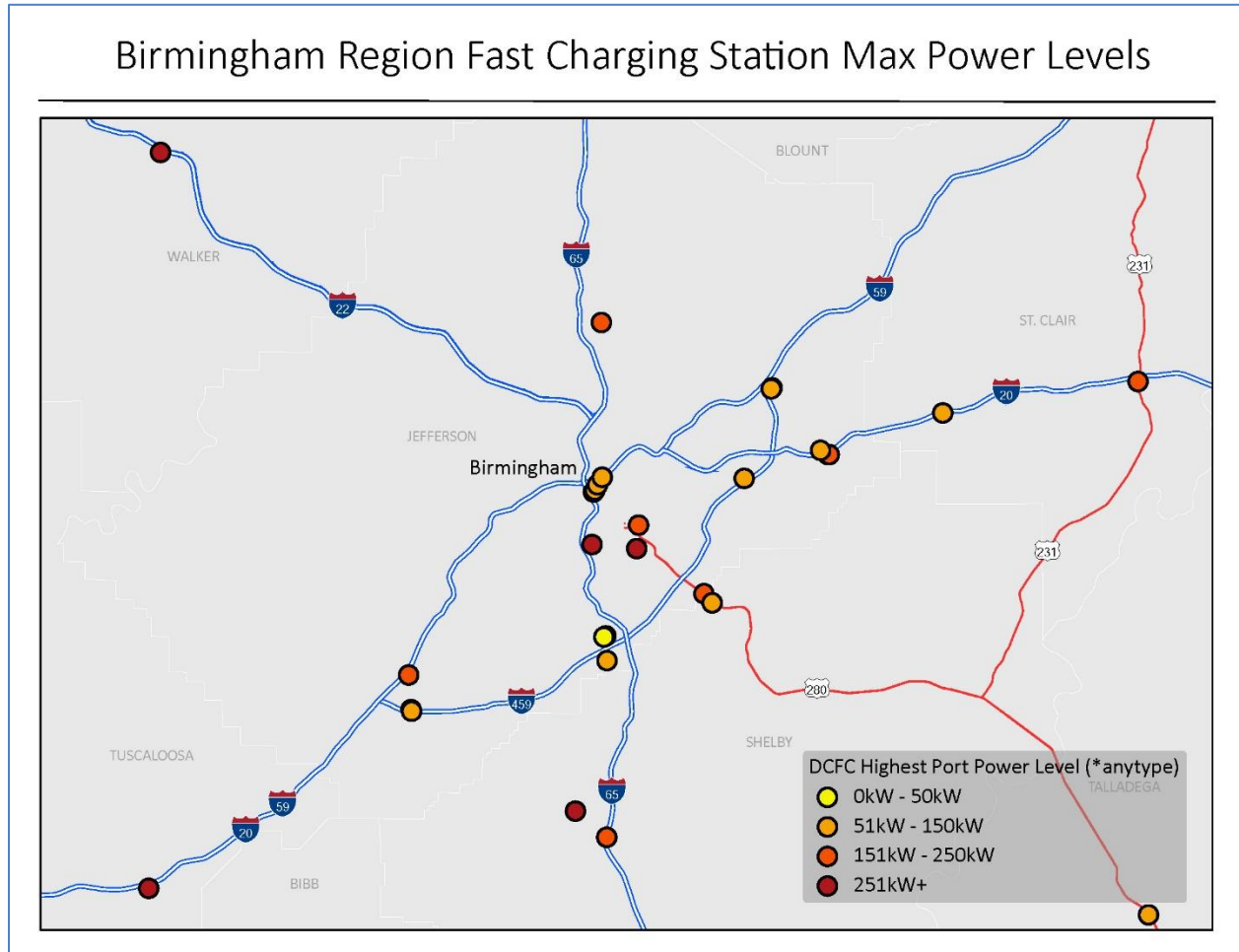
7. Promoting and facilitating the use of alternative fuels and the installation of alternative fuel infrastructure in Jefferson and Shelby Counties
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10. Identifying needs and soliciting proposals for financial assistance to install alternative fuel infrastructure and retrofit diesel vehicles in Jefferson and Shelby counties.
11. Providing the RPC/MPO technical assistance and review of APCA program monitoring and evaluation, compiling data on the allocation of CMAQ funds and expected air quality benefits.
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ACFC works closely with the State of Alabama and other stakeholders to support EV infrastructure planning and awareness efforts. To learn more, review the plan, or provide public input, please visit <https://adeca.alabama.gov/ev/>.

Appendix B
Jefferson County Department of Health
Annual Report

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ALABAMA PARTNERS FOR CLEAN AIR ANNUAL PARTNER ACTIVITY REPORT:

JEFFERSON COUNTY DEPARTMENT OF HEALTH



OCTOBER 2023– SEPTEMBER 2024

Introduction

The Jefferson County Department of Health (JCDH) is a contributing partner of the Alabama Partners for Clean Air (APCA). JCDH also actively participates as a member of the APCA Steering Committee. Matt Lacke, Meteorologist, serves on the Steering Committee, with Jason Howanitz, Principal Air Pollution Engineer, acting as proxy. This report serves as an annual composition of activities and actions carried out by JCDH to be included in APCA's annual partner activity report.

JCDH's Air Quality Action Program

The "Air Quality Action Program" at JCDH promotes reducing pollution every day of the year, especially on air quality alert days, and how to obtain daily air quality forecasts. The program entails outreach in the local community, as well as, encouraging emission reducing activities internally.

An important goal of JCDH has been to promote air quality action throughout the Birmingham area. Education about air quality to the public is essential because the Birmingham area has historically been designated as non-attainment for one or more of the criteria air pollutants. JCDH does outreach in the local community at various venues and sometimes in conjunction with APCA. Topics included the state of Birmingham's air quality over time, the Air Quality Index, the different types of pollutants, the health effects of pollution, how weather affects pollution, and what actions to take to reduce pollution.

Air Quality Alerts

The chart below shows a summary of "Air Quality Alerts" that were issued for fine particulate matter (PM_{2.5}) and ozone (O₃) during the period October 2023 – September 2024. "Air Quality Alerts" are forecasted one to two days before the date of the alert. JCDH provides PM_{2.5} forecasts year-round and the Alabama Department of Environmental Management provides O₃ forecasts during the warm season (April through October). The information listed in the column labeled "Actual AQI Color" is from preliminary data and has not been through QA and QC procedures.

Date of Alert	Forecast AQI Color	Actual AQI Color	Pollutant
3/21/2024	Orange	Orange	PM _{2.5}
5/1/2024	Orange	Yellow	O ₃
6/12/2024	Orange	Yellow	O ₃
6/13/2024	Orange	Yellow	O ₃
6/14/2024	Orange	Orange	O ₃
6/22/2024	Orange	Orange	O ₃
6/25/2024	Orange	Yellow	O ₃
7/13/2024	Orange	Orange	O ₃

Contracts

As part of the larger Memorandum of Agreement between the RPC and JCDH for FY2024 (October 2023 – September 2024), JCDH had two subcontracts as a participating partner of APCA. The Environmental Monitoring for Public Access and Community Tracking (EMPACT) website, which was re-launched in FY2014 as the “Birmingham Air Quality” website, is maintained by the University of Alabama in Huntsville (UAH). The website provides JCDH, the Alabama Department of Environmental Management (ADEM), and the public with near real-time air quality monitoring data for the Birmingham area. Baron Advanced Meteorological Systems (BAMS) provides air quality forecast model data to JCDH and ADEM. Outreach materials were also a part of the FY2024 budget. The details of JCDH’s budget are shown in the table below.

	OCT 2023 – SEP 2024
Birmingham Air Quality Website Maintenance by UAH	\$18,200
BAMS Subscription Meteorological Service	\$48,000
Outreach Giveaways	\$5,800
Total	\$72,000

Air Quality Status

The 8-hour ozone standard (0.070 ppm) was effective on December 28, 2015. EPA designated Jefferson and Shelby Counties as attainment of the 8-hour standard and was effective January 16, 2018. The EPA also has the Birmingham area (Jefferson and Shelby Counties and a portion of Walker County) designated as attainment for the 2006 24-hour PM_{2.5} standard (35 µg/m³). Effective April 15, 2015, the EPA designated the Birmingham area as attainment of the 2013 annual PM_{2.5} standard (12 µg/m³). Effective May 6, 2024, the EPA lowered the annual PM_{2.5} standard to 9 µg/m³. Currently, EPA plans on making attainment designations for the new annual PM_{2.5} standard for the data period of 2022-2024. The Birmingham area is currently designated as attainment of all of EPA’s National Ambient Air Quality Standards through calendar year 2023.

Monitoring Data

Air quality reports were sent out to members of APCA on a monthly basis. These reports include daily AQI information for all monitored criteria air pollutants in the Birmingham area, a listing of alerts that were issued, and daily meteorological data. It should be noted that information in these monthly reports were preliminary and were not put through QA/QC procedures.

Below is detailed ozone and fine particulate matter monitoring data that is used to determine compliance with the Environmental Protection Agency’s (EPA) National Ambient Air Quality

Standards. Air monitoring data shown in this report is only through 2023. This is because air monitoring data is on a calendar year basis (i.e., January 1, 2023 – December 31, 2023) and this report is based on a fiscal year basis (i.e., October 1, 2023 – September 30, 2024).

Ozone

Effective December 28, 2015, EPA lowered the 8-hour ozone standard to 70 parts per billion (ppb). Compliance with the 8-hour standard at each site is determined by a design value that is an average of the 4th highest daily 8-hour ozone value at each site over a 3-year period. The most recent 3-year monitoring period was 2021-2023. The ozone monitoring network consists of 5 monitors in Jefferson County and 1 monitor in Shelby County. The table below displays the design values for ozone at each monitoring site throughout the Birmingham area. For the monitoring period of 2021-2023, no monitors violated the standard.

8-Hour Ozone Design Values (2021-2023)	
Monitor	Design Value (ppb)
Fairfield	67
Helena	63
Leeds	63
McAdory	63
North Birmingham	68
Tarrant	63

Fine Particulate Matter (PM_{2.5})

Effective May 6, 2024, the EPA lowered the annual PM_{2.5} standard to 9 µg/m³. A 3-year average of annual means is compared to the annual standard to determine compliance. The 24-hour PM_{2.5} standard is a 3-year average concentration, based on the 98th percentile for each year, and is set at 35 µg/m³. The most recent 3-year monitoring period was 2021-2023. Currently, EPA plans on making attainment designations for the new annual PM_{2.5} standard for the data period of 2022-2024. The fine particulate matter (PM_{2.5}) monitoring network consists of 5 monitors throughout Jefferson County. The tables below display the annual and 24-hour design values for PM_{2.5} at each monitor throughout Jefferson County.

Annual PM_{2.5} Design Values (2021-2023)	
Monitor	Design Value (µg/m³)
Arkadelphia	9.5
Leeds	8.4
McAdory	8.4
North Birmingham	9.6
Wylam	8.8

24-Hour PM_{2.5} Design Values (2021-2023)	
Monitor	Design Value (µg/m³)
Arkadelphia	20
Leeds	16
McAdory	18
North Birmingham	20
Wylam	19

Air Quality Exceedances

Below are tables showing the exceedances of the 8-hour ozone standard from 2014 through 2023 and exceedances of the 24-hour PM_{2.5} standard from 2014 through 2023. Note that the EPA lowered the 8-hour ozone standard in 2015 so there was a lower threshold to violate the standard. The 2 exceedances of the 24-hour PM_{2.5} standard in 2020 were due to the influence of Saharan dust.

Exceedances of the 8-Hour Ozone Standard for 2014-2023

Station	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Corner	0	0	1	0	0	1	0	0	1	
Fairfield	0	2	2	0	1	7	0	0	0	4
Helena	1	2	4	0	1	3	0	0	1	1
Hoover	0	2	2	0						
Leeds	0	0	1	0	1	1	0	0	0	2
McAdory	0	0	2	0	1	5	0	0	0	2
N. Birmingham	0	4	3	1	2	4	0	1	1	9
Tarrant	0	4	3	1	3	2	1	0	0	5
Total	1	14	18	2	9	23	1	1	3	23

Exceedances of the 24-Hour Fine Particulate Matter (PM_{2.5}) Standard for 2014-2023

Station	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Arkadelphia	0	0	0	0	0	0	1	0	0	0
Leeds	0	0	0	0	0	0	0	0	0	0
McAdory		0	0	0	0	0	0	0	0	0
N. Birmingham	0	0	0	0	0	0	1	0	0	0
Wylam	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	0	0	0

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Appendix C
Advance Consulting, LLC.
Annual Report

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Advanced Consulting Annual Report

October 1, 2023 – September 30, 2024

Total Community Events:	96
Total Events:	96
Total Pledge Cards from Community Events:	6,746
TOTAL PLEDGES CARDS:	6,746

Events

Event	Attendees	Pledge Cards
October 2023		
Oct 3 Shelby County Night Out	300	67
Oct 3 Titusville Comm Resource	100	38
Oct 5 Birmingham Library Resource Day	200	59
Oct 7 Concord Country Market	200	62
Oct 10 Calera Night Out	200	40
Oct 12 First Baptist Church Health Fair	200	91
Oct 14 Hay Hoover	400	133
Oct 14 Zion Star Health Fair	200	78
Oct 21 Pepper Place	500	128
Oct 28 Montevallo Art Stalk	500	112
Oct 29 Barking at the Moon/Fultondale	300	104
November 2023		
Nov 1 Archwell HF Roebuck	100	44

Nov 6 Senior Citizen Extravaganza	200	82
Nov 9 Homewood Senior Health Fair	100	29
Nov 17 Alzheimer's Vent	100	49
December 2023		
Dec 2 Cahabazaar Holiday Market	500	103
Dec 6 Titusville Senior Resource	100	59
Dec 7 Know & Grow Senior HF	100	33
Dec 13 Senior Holiday Cheer	300	108
January 2024		
Jan 3 Titusville HF	100	29
Jan 27 First Baptist Church HF Tarrant	200	77
Jan 30 Birmingham Library Expo	100	42
February 2024		
Feb 7 Titusville Senior Resource	100	24
Feb 21 Archwell Five Points West	100	49
March 2024		
March 2 Cahaba Night Bazaar	300	78
March 9 Helena Spring Market	200	81
March 23 Fairfield Health Fair	100	77
March 30 Birdsong Farmer's Market	100	36
April 2024		
April 2 Archwell Spring Health Fair	100	33
April 3 Titusville Resource Day	100	21

April 5 Reg Library & Arts Council	200	73
April 6 Reg Library & Arts Council	200	48
April 13 Concord Community Market	200	49
April 14 Paws in the Park	200	76
April 17 Birmingham Library Recovery Prog	200	62
April 20 Birmingham Health Fair/ Crossplex	200	63
April 20 Pepper Place	500	98
April 24 Senior Picnic	300	124
April 26 Ms. Senior Jefferson County	300	82
April 26 Pinson Farmer's Market	100	49
April 27 Celebrate Trails	300	112
April 27 Health & Wellness Fairfield	100	50
May 2024		
May 2 Woman's Health Archwell Midfield	100	43
May 4 Eastlake Farmer's Market	100	33
May 4 Shelby County Trade Day	200	49
May 8 Titusville Senior Resource Day	100	29
May 11 Cahaba Brewery Mother's Day Event	300	102
May 16 Know & Grow	200	83
May 17 Mindful May/ Norwood Library	100	49
May 18 Off the Beaten Path Pop UP	200	78
May 25 Birdsong Farmer's Market	100	48
May 30 Leeds Farmer's Market	100	37

May 31	Ross Bridge Farmer's Market	200	87
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June 2024

June 1	Trussville Farmer's Market	200	61
June 1	Walkathon Fairfield	200	66
June 2	Vulcan Birthday Bash	500	112
June 4	Men's Health Fair Archwell	100	49
June 5	Titusville Comm Resource Day	100	58
June 7	Ride the Dixie Railway	500	300
June 7	Columbiana Farmer's Market	100	32
June 8	Eastlake Fishing Rodeo	300	103
June 8	Eastlake Farmer's Market	100	22
June 10	Montevallo FM	100	50
June 11	Trussville FM	100	28
June 15	Valleydale FM	100	48
June 18	Homewood FM	200	53
June 21	Ross Bridge FM	200	58
June 22	Cahabazaar	300	106
June 27	I Love America Night	500	124

July 2024

July 3	Titusville Senior Resource Fair	100	39
July 6	Bessemer FM	100	48
July 8	Montevallo FM	100	41
July 9	West Homewood	200	56

July 12 Pinson FM	100	36
July 20 Back to School / Columbiana	100	58
July 23 West Homewood FM	100	44
August 2024		
Aug 6 West Homewood Night Out	200	63
Aug 6 Harpersville Night Out	100	39
Aug 7 Titusville Resource Day	100	22
Aug 10 Roosevelt City Back to School	200	77
Aug 10 Bessemer FM	100	48
Aug 14 AARP Healthfair	100	52
Aug 17 Alabaster City Health Fair	300	192
Aug 17 Helena FM	200	59
Aug 17 Cahaba Night Bazaar	300	103
Aug 24 Health Fair at Seventh Day Adventist	100	42
Aug 30 Back to School Rally/Titusville	100	53
Aug 31 Bessemer FM	100	46
September 2024		
Sept 4 Titusville Senior Expo	100	38
Sept 7 Pepper Place	500	104
Sept 13 Fall into Wellness	200	101
Sept 14 Wellness/Safety Expo Bessmer	100	53
Sept 17 Children's Hospital Health Fair	700	400
Sept 21 Paw Palooza	200	68

Sept 24 Trussville FM	100	21
Sept 28 Harpersville Day	300	83

Appendix D

Emissions Reductions Worksheets

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Emission Reductions by Ozone Awareness Program from October 1, 2023, to September 30, 2024

TIP FY2023 CMAQ Ozone Program Project Potential Emissions Reductions						
#	Project	Emissions, lbs./Day			# of	Note
		VOC	NOx	PM _{2.5}	Days	
1	Marketing/Public Outreach/Surveys including Employer/Employee Outreach, the Policy Exchange Foundation, and Jefferson County Department of Health Air Quality Alert	0.968	0.769	2.745	260	FY 2023
2	Clean Cities/Alternative Fuels-Hoover, Birmingham, BJCTA, ALDOT, and other Alternative Fuel Stations	70.281	58.323	1.206	365	Ethanol(E85), Compressed Natural Gas (CNG), and Electricity
3	Idle Free Zone-UWCA/Johnson Group	4.101	3.095	0.183	180	weekdays
	Maximum Daily Emissions Reductions	75.350	62.188	4.134	365	lbs. per day

#1 - VOC, NOx, and PM 2.5 Potential Emission Reduction Worksheet for Project 241, **Marketing/Public Outreach/Survey**

on Alert Days for October 1, 2022 - September 30, 2023 2/5/2024

Description	Assumption	Units
Jefferson County		
Estimated commuters to work[1]	288,229	persons
Assuming at least two trip reductions per person	2	trips per day
Number Affected days by Air Quality Campaign/Alert days for FY 2022 season [2]	8	days (weekdays)
Average trip length for Jefferson County	24.2	miles per trip
Percentage of people knowing Ozone Alert days[3]	35.29%	%
Percentage of taking actions among people knowing Out Reach Campaign/Ozone Alert da	57.02%	%
Percentage out of the 57.02% people taking carpool/bus/telecommuting due to Ozone Aw	4.62%	%
Shelby County		
Estimated commuters to work	98,986	persons
Assuming at least two trip reductions per person	2	trips per day
Average trip length for Shelby county	15.9	miles per trip
Percentage of people knowing Ozone Alert day[3]	25.71%	%
Percentage of taking actions among people knowing Out Reach Campaign/Ozone Alert da	51.85%	%
Percentage out of the 51.85% people taking carpool/telecommuting due to Ozone Awaren	7.14%	%
Vehicle trips reduced in Jefferson County per day during Ozone Season [4]	42,872	Vehicle trips/Ozone Season
Vehicle trips reduced in Shelby County per day during Ozone Season	15,074	Vehicle trips/Ozone Season
Weekdays per year (D)	260	days/year
Average daily vehicles in Jefferson County participating	165	vehicles/day
Average daily vehicles in Shelby County participating	58	vehicles/day
VOC reduced in Jefferson County[5]	0.338	kg/day
NOx reduced in Jefferson County	0.283	kg/day
PM 2.5 reduced in Jefferson County	0.996	kg/day
VOC reduced in Shelby County[5]	0.101	kg/day
NOx reduced in Shelby County	0.066	kg/day
PM 2.5 reduced in Shelby County	0.249	kg/day
Total VOC reduced (VOCd)[6]	0.439	kg/day
Total NOx reduced (NOxd)	0.349	kg/day
Total PM 2.5 Direct emission reduced (PM2.5d)	1.245	kg/day
Total VOC reduced [6]	0.968	lbs./day
Total NOx reduced	0.769	lbs./day
Total PM 2.5 Direct emission reduced	2.745	lbs./day
Cost Effectiveness = (Annualized Cost) / (Annual Emissions Reduction)---the lower number, the better		
Project life expectancy (n)	1	years
Discount rate (i)	1%	used by ALDOT
Capital recover factor (CRF) = $(1+i)^n * (i) / ((1+i)^n - 1)$	1.01000	capital recovery factor
Project funding amount, C	\$236,203	capital cost
Project annual cost (AC) = (C)*(CRF)	\$238,565	\$ per year
Cost Effectiveness for VOC = (AC) / ((VOCd)*(D))	\$2,090	\$ per kilogram per year
Cost Effectiveness for NOx = (AC) / ((NOxd)*(D))	\$2,629	\$ per kilogram per year
Cost Effectiveness for VOC & NOx = (AC) / (((VOCd)+(NOxd))*(D))	\$1,164	\$ per kilogram per year
Cost Effectiveness for PM 2.5 Direct = (AC)/((PM2.5d)*(D))	\$737	\$ per kilogram per year

Note: For benefit of emission reductions, Marketing/public outreach, Jefferson County Department of Health EMPACT/Forecast, and the Advanced Consulting/United Way Employer/Employee Outreach are considered as one program.

[1] 2018 5-year American Community Survey (ACS) Report - Commuters

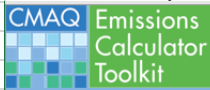
[2] There is five days of out reach campaign for air quality awareness.

[3] A Survey of Jefferson and Shelby County Resident Attitudes and Actions, submitted by Connections, Inc.

[4] Emission reductions due to vehicle trips reduced based on carpool emissions reductions of FHWA CMAQ Emissions Calculator Toolkit for 2023, see below for details.

[5] Emissions calculated for Jefferson county and Shelby County separately.

In Jefferson County



Carpooling

This calculator will estimate the reduction in emissions resulting from carpooling.

Navigator

Carpooling

[Vanpooling](#)

INPUT

User Guide

- (1) What is your project evaluation year?
- (2) Are the pick-up/drop-off locations centralized? Yes *Enter as roundtrip mileage*
- (3) Please choose one of the following questions to answer:
 (3a) What is the population of commuting workers?
 (3b) What is the number of vehicles participating in the carpool program?
- (4) What share of commuters participate in pool?
 (5) On average, how many passengers are there per carpool vehicle?
 (6) What is the average commute distance?

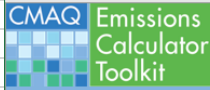
OUTPUT

Calculate Output

EMISSION REDUCTIONS

Pollutant	Total (kg/day)
Carbon Monoxide (CO)	15.717
Nitrogen Oxide (NOx)	0.283
Particulate Matter <10 µm (PM ₁₀)	0.066
Particulate Matter <2.5 µm (PM _{2.5})	0.996
Volatile Organic Compounds (VOC)	0.338
Carbon Dioxide Equivalence (CO ₂ e)	2494.169
Total Energy Consumption (MMBTU)	32.794

In Shelby County



Carpooling

This calculator will estimate the reduction in emissions resulting from carpooling.

Navigator

Carpooling

[Vanpooling](#)

INPUT

User Guide

- (1) What is your project evaluation year?
- (2) Are the pick-up/drop-off locations centralized? Yes *Enter as roundtrip mileage*
- (3) Please choose one of the following questions to answer:
 (3a) What is the population of commuting workers?
 (3b) What is the number of vehicles participating in the carpool program?
- (4) What share of commuters participate in pool?
 (5) On average, how many passengers are there per carpool vehicle?
 (6) What is the average commute distance?

OUTPUT

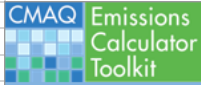
Calculate Output

EMISSION REDUCTIONS

Pollutant	Total (kg/day)
Carbon Monoxide (CO)	3.855
Nitrogen Oxide (NOx)	0.066
Particulate Matter <10 µm (PM ₁₀)	0.016
Particulate Matter <2.5 µm (PM _{2.5})	0.249
Volatile Organic Compounds (VOC)	0.101
Carbon Dioxide Equivalence (CO ₂ e)	580.086
Total Energy Consumption (MMBTU)	7.622

#2 - VOC, NOx, and PM 2.5 Potential Reduction Worksheet for Project #241: Clean Cities/Alternative Fuels			
Jefferson and Shelby Counties Alternative Fuels from October 1, 2022 to September 30, 2023			2/5/2024
Description	Assumption	Note	
(1) Gasoline gallon equivalent of ethanol E85[1]	89,386	gallons for fiscal year 2023	
Gasoline gallon equivalent of biodiesel B20	0	gallons for fiscal year 2023	
Gasoline gallon equivalent of biodiesel B100	0	gallons for fiscal year 2023	
Gasoline gallon equivalent of Hydrogen	0	gallons for fiscal year 2023	
Gasoline gallon equivalent of LNG	0	gallons for fiscal year 2023	
Gasoline gallon equivalent of Compressed Natural Gas (CNG) for Transit bus	773,001	gallons for fiscal year 2023	
Gasoline gallon equivalent of CNG for other bus/truck	702,610	gallons for fiscal year 2023	
Gasoline gallon equivalent of Liquefied petroleum gas (LPG)	168,615	gallons for fiscal year 2023	
Gasoline gallon equivalent of all Electric Car, Plug in Hybird, & ZeroRPM (see VMT below)	1,537,483	gallons for fiscal year 2023	
Where, Gasoline gallon equivalent of Fire truck and Ambulance from ZeroRPM	0	gallons for fiscal year 2023	
(2) Estimated vehicle miles traveled and vehicle trips			
Assuming average vehicle miles per gallon for Transit bus	6.0	miles per gallon	
Assuming average vehicle miles per gallon for truck	7.8	miles per gallon	
Assuming average vehicle miles per gallon for passenger vehicles	23.6	miles per gallon	
Average trips distance for Transit Bus	10.0	miles per trip	
Average travel distance for passenger vehicle trip	19.1	miles per trip	
Average trip distance for truck in the MPO area (for one-way trip)	38.1	miles per trip	
Estimated bus miles traveled (VMTcngbus) based on CNG [2]	4,638,006	vehicle miles per year	
Estimated vehicle (truck) miles traveled (VMTcngv) based on CNG	5,480,358	vehicle miles per year	
Estimated vehicle (truck) miles traveled (VMTlpgv) based on LPG	1,315,197	vehicle miles per year	
Estimated passenger vehicle miles traveled(VMTe85) based on ethanol (E85)	2,109,510	vehicle miles per year	
Estimated passenger vehicle miles traveled (VMTelectric) based on electric cars and plug in Hyt	35,245,440	vehicle miles per year	
Operating days per year	365	days/year	
Vehicle trips of Transit Buses (301 days per year including Saturday services)	1,541	trips/working day	
Bus service hours per day	15	hours/day	
Numbers of Transit Buses in operation (CNG)	101	buses	
Vehicle trips of trucks (CNG, 260 working days)	553	trips/working day	
Equivalent numbers of Trucks (CNG), 2 trips per day per vehicle	277	trucks	
Vehicle trips of trucks (LPG, 260 working days)	133	trips/working day	
Equivalent numbers of Trucks (LPG), 2 trips per day per vehicle	66	trucks	
Vehicle trips of ethanol vehicles	303	trips/day	
Equivalent numbers of Vehicles (Ethanol), 2 trips per day per vehicle	151	vehicles	
Total vehicle trips of electric cars	5,056	trips/day	
Equivalent numbers of Electric cars (PHEV *55%+BEV)	3,060	vehicles	
Fire truck idling hour reduction be ZeroRPM	5.44	hours/day	
Fire truck restarting numbers during idling hour reduction be ZeroRPM	3	times/day	
Fire truck average mileage per gallon diesel	4.0	miles/gallon	
Average mileage of a fire truck per year	4,500	miles/year	
Equivalent number of fire trucks	0	vehicles	
(3) Total daily Vehicle Mile Traveled reductions	0	vehicle miles per year	

(4) Potential Emission Reductions: alternative fuel		
(a) Diesel & CNG bus emissions [3]		
Bus VOC emission reductions for CNG buses, VOCbus	7.800	kilograms/day (2023)
Bus NOx emission reductions for CNG buses, Noxbus	3.944	kilograms/day (2023)
Bus PM 2.5 emission reductions for CNG buses, PM25bus	0.047	kilograms/day (2023)
(b) Estimated emissions reduction for CNG trucks		
Truck VOC emission deference using CNG, VOCT	0.084	kilograms/day (2023)
Truck NOx emission difference using CNG, Noxt	0.960	kilograms/day (2023)
Truck PM 2.5 emission difference using CNG, PM25t	0.033	kilograms/day (2023)
(c) Estimated emissions reduction for LPG trucks		
Truck VOC emission deference using LPG, VOCT	0.004	kilograms/day (2023)
Truck NOx emission difference using LPG, Noxt	0.165	kilograms/day (2023)
Truck PM 2.5 emission difference using LPG, PM25t	0.002	kilograms/day (2023)
(d) E85 emissions of passenger vehicles [4]		
VOC Emissions reductions from E85 over gasoline passenger vehicles, VOCE	0.371	kilograms/day (2023)
NOx Emissions reductions from E85 over gasoline passenger vehicles, Noxe	1.045	kilograms/day (2023)
PM 2.5 Emissions reductions from E85 over gasoline passenger vehicles, PM2.5e	0.016	kilograms/day (2023)
(e) Electric car emissions and regular gas passenger vehicles [5]		
VOC Emissions reductions from electric car over gasoline passenger vehicles, VOCAe	23.620	kilograms/day (2023)
NOx Emissions reductions from electric car over gasoline passenger vehicles, NOxae	20.341	kilograms/day (2023)
PM 2.5 Emissions reductions from electric car over gasoline passenger vehicles, PM2.5ae	0.449	kilograms/day (2023)
(f) Reduced Idling (No ZeroRPM vehicle in 2023)		
VOC Emissions due to Fire Truck idling 1 hour, VOCE	0.021	kilograms/day (2023)
NOx Emissions due to Fire Truck idling 1 hour, Noxe	0.113	kilograms/day (2023)
PM 2.5 Emissions due to Fire Truck idling 1 hour, PM2.5e	0.007	kilograms/day (2023)
VOC Emissions due to Fire Truck restart one time, VOCE	0.003	kilograms/day (2023)
NOx Emissions due to Fire Truck restart one time, Noxe	0.009	kilograms/day (2023)
PM 2.5 Emissions due to Fire Truck restart one time, PM2.5e	0.000	kilograms/day (2023)
VOC Emissions Reductions due to Fire Truck Reduced Idling by ZeroRPM, VOCE	0.000	kilograms/day (2023)
NOx Emissions Reductions due to Fire Truck Reduced Idling by ZeroRPM, Noxe	0.000	kilograms/day (2023)
PM 2.5 Emissions Reductions due to Fire Truck Reduced Idling by ZeroRPM, PM2.5e	0.000	kilograms/day (2023)
(5) Total : VOC emissions reduced	31.879	kilograms per day
NOx emissions reduced	26.455	kilograms per day
PM 2.5 Direct emissions reduced	0.547	kilograms per day
VOC emissions reduced in lbs. per day, 1 kilogram = 2.2046 lbs.	70.28	lbs. per day
NOx emissions reduced in lbs. per day	58.32	lbs. per day
PM 2.5 Direct emissions reduced in lbs. per day	1.21	lbs. per day
(6) Cost Effectiveness = (Annualized Cost) / (Annual Emission Reduction)---the lower number, the better		
Project life expectancy (n)	1	years
Discount rate (i)	1%	used by ALDOT
Capital recover factor (CRF) = $(1+i)^n * i / ((1+i)^n - 1)$	1.01000	capital recovery factor
Project funding amount [6]	\$292,716	capital cost
Project annual cost (AC) = (C)*(CRF)	\$295,643	\$ per year
Number of days project affected (D)	365	days for 1 year
Cost Effectiveness for VOC = (AC) / ((VOC)*(D))	\$25.41	\$ per kilogram per year
Cost Effectiveness for NOx = (AC) / ((NOx)*(D))	\$30.62	\$ per kilogram per year
Cost Effectiveness for VOC & NOx = (AC) / (((VOC)+(NOx))*(D))	\$13.89	\$ per kilogram per year
Cost Effectiveness for PM 2.5 = (AC) / ((PM2.5)*(D))	\$1,481.85	\$ per kilogram per year
Source: Alabama Partners for Clean Air (APCA), Annual Activity report October 1, 2022 to September 30, 2023		
[1] APCA Alternative Fuel Summary 2023		
[2] (Estimated Vehicle Miles Traveled) = (Gasoline gallon equivalent) x (Miles per gallon)		
[3], [4], [5] FHWA CMAQ Emissions Calculator Toolkit		
[6] Total project cost = Federal funds + local matches if needed		



Non-EV Transit Bus Replacement and Fueling Infrastructure

This calculator will estimate the reduction in emissions resulting from the replacement of a diesel or CNG transit bus with an alternative fuel transit bus and/or the change in mileage to new restricted access charging infrastructure, if applicable.

- Navigator
- Transit Bus Diesel Retrofit
- EV Transit Bus Replacement

INPUT

[User Guide](#)

(1) What is your project evaluation year? [Reset to Default Values](#)

(2) Which components does your project incorporate?
 Only answer questions specific to project components. If both components are chosen, answer Questions 1-7 and 9-11.

Project Components:
 Non-EV Transit Bus Replacement *Questions 1-7*
 Restricted Access Infrastructure *Questions 1-2 & 8-11*

REPLACEMENT

(3) What is the model year of the current transit buses?

(4) What conventional fuel do the current transit buses use?

(5a) What activity data do you have?
 Note: You must enter at least one value for transit bus activity.

Fleet Activity:
 Vehicle Miles Traveled (VMT)
 Vehicle Population

(5b) Input the annual activity for the total number of transit buses to be replaced

Annual Total Vehicle Miles Traveled
 Annual Transit Bus Population

(6) What is the model year of the replacement transit buses?

(7) What fuel will the replacement transit buses use?

INFRASTRUCTURE

(10) How will the distance to your primary fueling facility change after developing new infrastructure?

(11) Please enter the anticipated change in annual VMT to fuel your vehicle fleet at the new fueling infrastructure **Change in Vehicle Miles Tr**

OUTPUT

[Calculate](#)

FLEET PERFORMANCE

Last Updated: 2/6/2024 9:06:23 AM

Annual Activity for Replacement Transit Buses

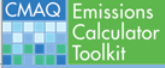
	BEFORE	AFTER
Annual Total Vehicle Miles Traveled	4,638,006	4,638,006
Annual Transit Bus Population	101	101
Annual Miles Traveled per Vehicle	45,921	45,921

EMISSION REDUCTIONS

Pollutant	Total
Carbon Monoxide (CO)	315,5401
Particulate Matter <2.5µm (PM _{2.5})	0.0466
Particulate Matter <10µm (PM ₁₀)	0.0527
Nitrogen Dioxide (NO ₂)	3.9436
Volatile Organic Compounds (VOC)	7.8002
Carbon Dioxide (CO ₂)	1,951,737
Carbon Dioxide Equivalence (CO ₂ e)	6,767,792
Total Energy Consumption (TEC)	31,337

Note: this module only calculates CO₂, CO₂e and TEC reductions for diesel and CNG bus replacements. See user guide for more details.

Emissions Reductions of Alternative Fuel for CNG Trucks based on FHWA CMAQ Emissions Calculator Toolkit



Unrestricted Access Alternative Fuel Infrastructure

This calculator will estimate the reduction in emissions resulting from developing alternative fuel infrastructure with unrestricted access. The calculator does not consider lifecycle emissions, particularly it refrains from estimating any emissions that may occur outside of vehicle operations. Note that this calculator does not apply to transit buses, which are included in a separate tool.

Navigator

- On-Road Alternative Fuel
- Vehicle Purchase
- Unrestricted Infrastructure

[User Guide](#)

[Reset Inputs](#)

(1) What is your project evaluation year?

(2) Please input the estimated number of vehicles in your study area

(3) Which alternative fuel will be supplied at this new infrastructure?
Compressed Natural Gas (CNG)

(4) Please enter the projected market share of replacement alternative fuel vehicles after construction of the new infrastructure.

(5) Please unselect below any vehicle source type(s) that will not have alternative fuel vehicle purchases and then click the button to fill the table with default estimates for populations and activity per vehicle. [Fill Table](#)

Vehicle Source Type	Average Annual Miles Traveled Per	Number of Existing Conventional Fuel Vehicles	Number of Replacement Alternative Fuel
<input type="checkbox"/> Passenger Car	0	0	0
<input type="checkbox"/> Passenger Truck	0	0	0
<input checked="" type="checkbox"/> Light Commercial Truck	12,459	3,445	267
<input checked="" type="checkbox"/> School Bus	10,369	315	9
<input checked="" type="checkbox"/> Refuse Truck	18,420	40	1
<input type="checkbox"/> Single Unit Short-Haul Truck	0	0	0
<input type="checkbox"/> Single Unit Long-Haul Truck	0	0	0
<input type="checkbox"/> Combination Short-Haul Truck	0	0	0
<input type="checkbox"/> Combination Long-Haul Truck	0	0	0
TOTAL		3,800	277

Note: users may overwrite default values in the table with local estimates where applicable.

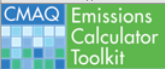
[Calculate Output](#)

EMISSION REDUCTIONS

Pollutant	Total (kg/dsy unless noted)
Carbon Monoxide (CO)	0.455
Nitrogen Oxide (NOx)	0.360
Particulate Matter <2.5 µm (PM _{2.5})	0.033
Particulate Matter <10 µm (PM ₁₀)	0.063
Volatile Organic Compounds (VOC)	0.034
Carbon Dioxide (CO ₂)	408.459
Carbon Dioxide Equivalent (CO ₂ e)	408.365
Total Energy Consumption (MMBTU/dsy)	5.263

Note: emissions models have limited CO₂, CO₂e and energy estimates for alternative fuel vehicles, they only exist for E85 light-duty vehicles, CNG heavy-duty vehicles, and all FCV vehicles.

Emissions Reductions of Alternative Fuel for LPG Passenger Vehicles/Trucks based on FHWA CMAQ Emissions Calculator Toolkit



Unrestricted Access Alternative Fuel Infrastructure

This calculator will estimate the reduction in emissions resulting from developing alternative fuel infrastructure with unrestricted access. The calculator does not consider lifecycle emissions, particularly it refrains from estimating any emissions that may occur outside of vehicle operations. Note that this calculator does not apply to transit buses, which are included in a separate tool.

Navigator

- On-Road Alternative Fuel
- Vehicle Purchase
- Unrestricted Infrastructure

[User Guide](#)

[Reset Inputs](#)

(1) What is your project evaluation year?

(2) Please input the estimated number of vehicles in your study area

(3) Which alternative fuel will be supplied at this new infrastructure?
Propane (LPG)

(4) Please enter the projected market share of replacement alternative fuel vehicles after construction of the new infrastructure.

(5) Please unselect below any vehicle source type(s) that will not have alternative fuel vehicle purchases and then click the button to fill the table with default estimates for populations and activity per vehicle. [Fill Table](#)

Vehicle Source Type	Average Annual Miles Traveled Per	Number of Existing Conventional Fuel Vehicles	Number of Replacement Alternative Fuel
<input type="checkbox"/> Passenger Car	0	0	0
<input type="checkbox"/> Passenger Truck	0	0	0
<input checked="" type="checkbox"/> Light Commercial Truck	12,459	3,445	63
<input checked="" type="checkbox"/> School Bus	10,369	315	2
<input checked="" type="checkbox"/> Refuse Truck	18,420	40	0
<input type="checkbox"/> Single Unit Short-Haul Truck	0	0	0
<input type="checkbox"/> Single Unit Long-Haul Truck	0	0	0
<input type="checkbox"/> Combination Short-Haul Truck	0	0	0
<input type="checkbox"/> Combination Long-Haul Truck	0	0	0
TOTAL		3,800	66

Note: users may overwrite default values in the table with local estimates where applicable.

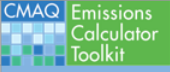
[Calculate Output](#)

EMISSION REDUCTIONS

Pollutant	Total (kg/dsy unless noted)
Carbon Monoxide (CO)	0.033
Nitrogen Oxide (NOx)	0.165
Particulate Matter <2.5 µm (PM _{2.5})	0.002
Particulate Matter <10 µm (PM ₁₀)	0.004
Volatile Organic Compounds (VOC)	0.004
Carbon Dioxide (CO ₂)	N/A
Carbon Dioxide Equivalent (CO ₂ e)	N/A
Total Energy Consumption (MMBTU/dsy)	N/A

Note: emissions models have limited CO₂, CO₂e and energy estimates for alternative fuel vehicles, they only exist for E85 light-duty vehicles, CNG heavy-duty vehicles, and all FCV vehicles.

Emissions Reductions of Alternative Fuel for E85 vehicles based on FHWA CMAQ Emissions Calculator Toolkit



Unrestricted Access Alternative Fuel Infrastructure

This calculator will estimate the reduction in emissions resulting from developing alternative fuel infrastructure with unrestricted access. The calculator does not consider lifecycle emissions, particularly it refrains from estimating any emissions that may occur outside of vehicle operations. Note that this calculator does not apply to transit buses, which are included in a separate tool.

Navigator

On-Road Alternative Fuel Vehicle Purchase

Unrestricted Infrastructure

INPUT
User Guide

(1) What is your project evaluation year?

(2) Please input the estimated number of vehicles in your study area

(3) Which alternative fuel will be supplied at this new infrastructure?

(4) Please enter the projected market share of replacement alternative fuel vehicles after construction of the new infrastructure

(5) Please unselect below any vehicle source type(s) that will not have alternative fuel vehicle purchases and then click the button to fill the table with default estimates for populations and activity per vehicle

Select All

Unselect All

Vehicle Source Type	Average Annual Miles Traveled Per Vehicle	Number of Existing Conventional Fuel Vehicles	Number of Replacement Alternative Fuel
<input type="checkbox"/> Passenger Car	0	0	0
<input type="checkbox"/> Passenger Truck	0	0	0
<input checked="" type="checkbox"/> Light Commercial Truck	12,459	3,445	145
<input checked="" type="checkbox"/> School Bus	10,369	315	5
<input checked="" type="checkbox"/> Refuse Truck	19,420	40	1
<input type="checkbox"/> Single Unit Short-Haul Truck	0	0	0
<input type="checkbox"/> Single Unit Long-Haul Truck	0	0	0
<input type="checkbox"/> Combination Short-Haul Truck	0	0	0
<input type="checkbox"/> Combination Long-Haul Truck	0	0	0
TOTAL		3,800	151

Fill Table

Note: users may overwrite default values in the table with local estimates where applicable.


OUTPUT
Calculate Output

EMISSION REDUCTIONS

Pollutant	Total (kg/day unless noted)
Carbon Monoxide (CO)	5,302
Nitrogen Oxide (NOx)	1,045
Particulate Matter <2.5 µm (PM _{2.5})	0.016
Particulate Matter <10 µm (PM ₁₀)	0.024
Volatile Organic Compounds (VOC)	0.371
Carbon Dioxide (CO ₂)	163,842
Carbon Dioxide Equivalent (CO ₂ e)	167,639
Total Energy Consumption (MMBTU/day)	1,350

Note: emissions models have limited CO₂, CO₂e and energy estimates for alternative fuel vehicles, they only exist for E85 light-duty vehicles, CNG heavy-duty vehicles, and all FCV vehicles.

Emissions Reductions for all electric vehicles and plug in hybrid based on FHWA CMAQ Emissions Calculator Toolkit



Unrestricted Access EV Charging Infrastructure

This calculator will estimate the reduction in emissions resulting from developing electric vehicle charging infrastructure with unrestricted access. The calculator does not consider lifecycle emissions, particularly it refrains from estimating any emissions that may occur outside of vehicle operations. Electric transit buses and transit bus charging infrastructure are included in the Transit Bus Upgrades & System Improvements tool.

Navigator

Un-Hoad Electric Vehicle Purchase & Restricted Infrastructure

Unrestricted Infrastructure

INPUT
User Guide

(1) What is your project evaluation year?

(2) Please input the estimated number of vehicles in your study area

(3) Please enter the projected market share of replacement electric vehicles after construction of the new infrastructure

(4) Please unselect below any vehicle source type(s) that will not have electric vehicle purchases and then click the button to fill the table with default estimates for populations and activity per vehicle

Select All

Unselect All

Vehicle Source Type	Average Annual Miles Traveled Per Vehicle	Number of Existing Conventional Fuel Vehicles	Number of Replacement Electric Vehicles Projected
<input checked="" type="checkbox"/> Passenger Car	11,136	1,457	1,457
<input checked="" type="checkbox"/> Passenger Truck	12,176	1,603	1,603
<input type="checkbox"/> Light Commercial Truck	0	0	0
<input type="checkbox"/> School Bus	0	0	0
<input type="checkbox"/> Refuse Truck	0	0	0
<input type="checkbox"/> Single Unit Short-Haul Truck	0	0	0
<input type="checkbox"/> Single Unit Long-Haul Truck	0	0	0
<input type="checkbox"/> Combination Short-Haul Truck	0	0	0
<input type="checkbox"/> Combination Long-Haul Truck	0	0	0
TOTAL		0	0

Fill Table

Note: users may overwrite default values in the table with local estimates where applicable.

OUTPUT
Calculate Output

EMISSION REDUCTIONS

Pollutant	Total (kg/day unless noted)
Carbon Monoxide (CO)	367.026
Nitrogen Oxide (NOx)	20.341
Particulate Matter <2.5 µm (PM _{2.5})	0.449
Particulate Matter <10 µm (PM ₁₀)	0.507
Volatile Organic Compounds (VOC)	23.620
Carbon Dioxide (CO ₂)	35,263,445
Carbon Dioxide Equivalent (CO ₂ e)	35,437,489
Total Energy Consumption (MMBTU/day)	476.452

#3 - VOC, NOx, and PM 2.5 Potential Reduction Worksheet for Project 241: Idle Free Zones			
Encouraging parents sit in idling car in pick up waiting zone to turn off engines by UWCA/Johnson Group			2/6/2024
1. Criteria & Assumptions			
Description	Assumption	Note	
(1) Data collection and assumptions			
# of Schools involved	118		
Total # of Carpools (C) ^[1]	7,558	cars	
Target % of carpools will be switched to shutting off engine (P) ^[2]	33%	%	
Total # of cars whose engine shut off due to program (TV) = (C) x (P)	2,494	vehicles	
Average waiting time(T)	0.70	hour	
# of picking up per day (DP)	1	times per day per vehicle	
VOC idling emissions (Rvoc) ^[3]	3948.0	grams/idle hour	
NOx idling emissions (Rnox)	4095.0	grams/idle hour	
PM 2.5 idling emissions (PMf)	142.0	grams/idle hour	
VOC start up emissions (Svoc)	904.0	grams/starts	
NOx start up emissions (Snox)	1463.0	grams/starts	
PM 2.5 start up emissions (PMs)	16.0	grams/starts	
(2) Emission reduction calculations			
VOC emissions reduced per day (VOC r) = ((T) x (Rvoc) - (Svoc)) x (DP)/1,000	1.860	kilograms/day	
NOx emissions reduced per day (NOx r) = ((T) x (Rnox) - (Snox)) x (DP)/1,000	1.404	kilograms/day	
PM 2.5 emissions reduced (PM) = (TV) x ((T) x (PMf) - (PMs)) x (DP)/1,000	0.083	kilograms/day	
VOC emissions reduced per day (VOC r) in lbs., 1kilogram = 2.2046lbs.	4.100	lbs./day	
NOx emissions reduced per day (NOx r) in lbs.	3.094	lbs./day	
PM 2.5 emissions reduced (PM) in lbs.	0.184	lbs./day	
(3) VMT reductions	0.00	vehicle miles/day	
(4) Cost Effectiveness = (annualized cost) / (annual emission reduction)--the lower number, the better			
Project life expectancy (n)	1	years	
Discount rate (i)	1%	used by ALDOT	
Capital recover factor (CRF) = $(1+i)^n * i / ((1+i)^n - 1)$	1.01000	capital recovery factor	
Project funding amount (C)	\$65,791	capital cost	
Project annual cost (AC) = (C)*CRF)	\$66,449	\$ per year	
Number of days project affected per year (Day)	180	days per year	
Cost Effectiveness for VOC = (AC) / ((VOC r)*(Day))	\$199	\$ per kilogram per year	
Cost Effectiveness for NOx = (AC) / ((NOx r)*(Day))	\$263	\$ per kilogram per year	
Cost Effectiveness for total of VOC & NOx = (AC) / (((VOCr)+(NOxr))*(Day))	\$113	\$ per kilogram per year	
Cost Effectiveness for PM 2.5 = (AC) / ((PM)*(Day))	\$4,426	\$ per kilogram per year	
Note:			
[1]: Source: estimates based on the participants students per school: 572, total of 67,496 students. 7,558 of them (11.2%) take more then 40 minutes to pick up kids in school.			
[2]: Estimated target after program			
[3]: Estimated passenger vehicle idle emissions and start emissions for parking 60 minutes or less, based on project level emissions of MOVES4 (turn off engine, park car , pick up child from school, and restart car. Assume average time is about 42 minutes. Emissions is given for a weekday of April 2023)			

Emission Reductions in Grams from MOVES4 Project Level Emission Analysis								
Road	NOx	Total_PM25	Brake_PM25	Tire_PM25	VOC			
1	1463	16	0	0	904			
5	4095	142	0	0	3948			
Links input file for MOVES4 Project Level Emission Analysis								
linkID	countyID	zoneID	roadTypeID	linkLength	linkVolume	linkAvgSpeed	linkDescription	linkAvgGrade
1	1073	10730	5	0	2494		0 Idle Link	0
2	1073	10730	1	0	2494		0 off-network start	0
Link Source Types input file for MOVES4 Project Level Emission Analysis								
linkID	sourceTypeID	sourceTypeHourFractio						
1	21	0.59						
1	31	0.41						
Off-Network input file for MOVES4 Project Level Emission Analysis								
zoneID	sourceTypeID	vehiclePopulation	startFraction	extendedIdleFraction	parkedVehicleFraction			
10730	21	1472	1	0	0			
10730	31	1022	1	0	0			
Operating Mode Distribution input file for MOVES4 Project Level Emission Analysis								
sourceTyp	hourDayID	linkID	polProcessID	opModeID	opModeFrz			
21	165	2	302	103	1			
21	165	2	316	103	1			
21	165	2	8702	103	1			
21	165	2	8716	103	1			
21	165	2	11002	103	1			
21	165	2	11016	103	1			
31	165	2	302	103	1			
31	165	2	316	103	1			
31	165	2	8702	103	1			
31	165	2	8716	103	1			
31	165	2	11002	103	1			
31	165	2	11016	103	1			
Run Spec Summary input file for MOVES4 Project Level Emission Analysis								
Output Database Server Name: [using default]								
Output Database Name: Jeff042023_ProLevel_Idel_Inventory_Out								
Time Spans:								
Aggregate By: Hour								
Years: 2023								
Months: April								
Days: Weekdays								
Hours: Begin Hour: 15:00 - 15:59								
End Hour: 15:00 - 15:59								
Geographic Bounds:								
LINK geography								
Selection: Jefferson County, AL (01073)								
On Road Vehicles:								
Passenger Car - Diesel Fuel								
Passenger Car - Electricity								
Passenger Car - Ethanol (E-85)								
Passenger Car - Gasoline								
Passenger Truck - Diesel Fuel								
Passenger Truck - Electricity								
Passenger Truck - Ethanol (E-85)								
Passenger Truck - Gasoline								
Road Types:								
Off-Network								
Urban Unrestricted Access								
Pollutants and Processes:								
Running Exhaust (Road 5)								
Start Emissions (Road 1)								

Appendix E
The Johnson Management Group
Annual Report

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The Johnson Management Group, LLC

P.O. Box 59005

Birmingham, Al 35259

205-370-7805

Annual Report 2023- 2024

JMG conducted, facilitated and attended neighborhood meetings, church social events, community and school events to share the message of air quality.

JMG conducted 59 audits between October 2023 and September 2024.

The following schools were included: Martha Gaskins, Oxmoor Valley, Huffman Middle, West End Academy, Holy Family, Advent, Ephesus Academy, Midfield Elementary, Hayes, Cornerstone, Center Point, Barrett, Robinson, Washington, Glen Iris, Epic, Rutledge, Homewood Middle, Pleasant Grove Elementary, Edgewood, Hemphill, Parker, Clay Elementary, Wilkerson, Bryant Elementary, Jonesboro, Clay Chalkville, Central Park, Phillips Academy Homewood, Rudd, Bumpus, Hoover Christian, Deer Valley, Princeton, Jackson Olin, Lipscomb, Hudson, CJ Donald, Glen Oaks, Minor, Carver, Ramsay, Minor Community, Erwin Middle, Tarrant Elementary, Sun Valley, Leeds High, Green Acres, Inglenook, Woodlawn, Wylam, Gardendale, Tarrant High, Jones Valley, Martha Gaskins, Tarrant

The audits yielded 6,673 pieces of APCA literature being handed out and 1,948 cars shutting off because of the message to turn the key and be idle free.

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