ALABAMA PARTNERS FOR CLEAN AIR

www.alabamacleanair.org

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

Annual Activity Report
October 1, 2022 – September 30, 2023

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APCA Annual Report
October 1, 2022 – September 30, 2023

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. This report does 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, 2022 – to September 30, 2023. 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 $\mu g/m^3$). Effective April 15, 2015, the EPA designated the Birmingham area as an attainment of the 2013 annual $PM_{2.5}$ standard (12 $\mu g/m^3$). The Birmingham area is currently designated as attainment of all of EPA's National Ambient Air Quality Standards through calendar year 2022.

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 **$594,714.** 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, 2022 – September 30, 2023).

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 three years. The most recent 3-year monitoring period was 2020-2022. The ozone monitoring network comprises six monitors in Jefferson County and one 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 2020-2022, no monitors violated the standard.

TABLE 1

8-Hour Ozone Design Values (2020-2022)	
Monitor	**Design Value (ppb)**
Corner	**60**
Fairfield	**63**
Helena	**61**
Leeds	*****
McAdory	**62**
North Birmingham	**63**
Tarrant	**60**

*Due to not meeting data completeness criteria, the design value is not valid

FINE PARTICULATE MATTER ($PM_{2.5}$)

Effective March 18, 2013, the EPA lowered the annual $PM_{2.5}$ standard to 12 $\mu g/m^3$. A 3-year average of yearly 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 $\mu g/m^3$. The most recent 3-year monitoring period was 2020-2022. The fine particulate matter ($PM_{2.5}$) monitoring network comprises five 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. There were no violations of the annual and 24-hour $PM_{2.5}$ standards for 2020-2022.

TABLE 2

Annual $PM_{2.5}$ Design Values (2020-2022)	
Monitor	**Design Value (µg/m^3)**
Arkadelphia	*
Leeds	8.4
McAdory	8.1
North Birmingham	9.5
Wylam	8.2

TABLE 3

24-Hour $PM_{2.5}$ Design Values (2020-2022)	
Monitor	**Design Value (µg/m^3)**
Arkadelphia	*
Leeds	18
McAdory	18
North Birmingham	17
Wylam	18

AIR QUALITY EXCEEDANCES

Below are tables showing the exceedances of the 8-hour ozone standard from 2013 through 2022 and exceedances of the 24-hour $PM_{2.5}$ standard from 2013 through 2022. Note that the EPA lowered the 8-hour ozone standard in 2015, so there was a lower threshold for violating the standard. The two 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 2013-2022

Station	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Corner	1	0	0	1	0	0	1	0	0	1
Fairfield	0	0	2	2	0	1	7	0	0	0
Helena	0	1	2	4	0	1	3	0	0	1
Hoover	0	0	2	2	0					
Leeds	0	0	0	1	0	1	1	0	0	0
McAdory	0	0	0	2	0	1	5	0	0	0
N. Birmingham	0	0	4	3	1	2	4	0	1	1
Tarrant	1	0	4	3	1	3	2	1	0	0
Total	**2**	**1**	**14**	**18**	**2**	**9**	**23**	**1**	**1**	**3**

TABLE 5
Exceedances of the 24-Hour Fine Particulate Matter ($PM_{2.5}$) Standard for 2013-2022

Station	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Arkadelphia	0	0	0	0	0	0	0	1	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	0	1	0	0
Wylam	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**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 O_3 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 (O_3) during the period October 2022 – September 2023. "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 O_3 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
6/9/2023	Orange	Orange	O_3
6/28/2023	Orange	Orange	O_3
6/29/2023	Orange	Orange	O_3
6/30/2023	Orange	Yellow	O_3
7/18/2023	Orange	Yellow	$PM_{2.5}$
7/25/2023	Orange	Yellow	O_3
7/26/2023	Orange	Orange	O_3
7/28/2023	Orange	Yellow	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
When the AQI Is in this range:	***...air quality conditions are:***	***...as symbolized by this color:***
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 FY2023 (October 2022 – September 2023), 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 FY2023 Budget

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 2022 – September 2023

Program Area	Total Budget	Amount Invoiced *(Includes match $)*
Promotional Items / Print Material-RPC*	$15,000	$15,398.16
Media Buy-RPC**	$36,750	$35,718.50
Employer/Employee Outreach- Advanced Consulting	$50,000	$50,015.91
Idle Free Zones / School Education - Johnson Group	$71,250	$47,926.45
Idle Free Zones / School Education – UWCA	$0	$0
Clean Cities/Alternative Fuels and Diesel Retrofits- ACFC	$260,000	$213,232.43
EMPACT/Forecasts- JCDH	$72,000	$70,933.75
Program Administration- RPC***	$150,000	$161,488.42
Total	$655,000	$594,714

**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 2023, 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.

MEDIA OUTREACH CAMPAIGN 2023

The marketing outreach campaign kicked off with Air Quality Awareness Week and continued with a media campaign that launched on July 10th and continued through August 13, 2023. This period was selected because it falls in the peak date range for Air Quality season. The campaign featured television, print, email blasts, and digital ads on a weather app.

The television messages featured the theme, "Everyone Can Help!". Two 15-second commercials were produced 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 that combined 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 FORECASTS

Local television partners, WBRC-TV FOX6, WBMA-TV ABC33/40, and WIAT-TV CBS42, included Air Quality Forecasts in their local weather reports to help raise awareness of Air Quality Alert Days.

AIR QUALITY AWARENESS WEEK May 1-7, 2023

Each year, the Alabama Partners for Clean Air utilize Air Quality Awareness Week to keep air quality issues on their minds. Jefferson County Meteorologist Matt Lacke, spokesperson for the Alabama Partners for Clean Air, was interviewed on local media outlets throughout the week. The interviews aimed to promote Air Quality Awareness and educate the public about ways they can help make a difference.

Air Quality Awareness Week started with an interview on Talk of Alabama, a local community-oriented show that airs from 9 am to 10 am on WBMA-TV, ABC33/40. The interview aired on May 2nd and reached 7,900 viewers. Here is a link to the segment: **https://abc3340.com/station/talk-of-alabama/alabama-clean-air-partners-talk-of-alabama-522023#**

On Tuesday, May 3rd, 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.

Matt Lacke was also interviewed on CBS42's Midday News on May 4th to discuss Air Quality Awareness Week. This program had 15,700 viewers.

In addition to the interviews during Air Quality Awareness Week, WIAT-TV CBS42 produced a 2-minute news segment featuring Alabama Partners for Clean Air partners, CommuteSmart, and the Alabama Clean Fuels Coalition. This interview aired a total of six times in multiple newscasts and delivered a total of 62,900 impressions.

Lisa Smith with the Regional Planning Commission of Greater Birmingham appeared on WBRC-TV's Central Alabama Business Break. This segment is pre-recorded and airs in Good Day, Alabama. This interview aired on September 4th and delivered 39,100 impressions.

TABLE 9
Interviews

Date	Station	Program	Interviewed	Impressions
5/2/2023	ABC33340	Talk of Alabama	Matt Lacke	7,900
5/3/2023	BMR	Morning Blend	Matt Lacke	750
5/4/2023	CBS42	Midday News	Matt Lacke	15,700
7/19/2023	CBS42	Morning News	Lisa Smith/Michael Staley	8,100
7/19/2023	CBS42	4 PM News	Lisa Smith/Michael Staley	6,800
7/25/2023	CBS42	5 PM News	Lisa Smith/Michael Staley	13,600
7/30/2023	CBS42	10 PM News	Lisa Smith/Michael Staley	11,300
7/31/2023	CBS42	Midday News	Lisa Smith/Michael Staley	15,700
8/10/2023	CBS42	10 PM News	Lisa Smith/Michael Staley	7,400
9/4/2023	FOX6	Good Day	Lisa Smith	39,100
TOTAL				126,350

TABLE 10
Detailed Delivery by WBRC Fox6 News

Station	# of spots	Impressions	Added Value Description	Added Value
WBRC-TV	185	6,178,100	85 spots at no charge (value of $75)	$ 6,375.00
WBRC-TV			Air Quality Forecast- 35X @ $150 each	$ 5,250.00
WBRC-TV		32,300	Business Break Interview	$ 1,000.00
TOTALS	185	6,210,400		$ 12,625.00

TABLE 11
Detailed Delivery by Bounce TV

Station	# of spots	Impressions	Added Value Description	Added Value
BOUNCE	50	50,000	paid a reduced rate of $5 each (value of $15)	$ 500.00

TABLE 12
Detailed Delivery by CBS42

Station	# of spots	Impressions	Added Value Description	Added Value
WIAT-TV	234	2,056,300	32 spots at no charge (value of $50)	$ 1,600.00
WIAT-TV		15,700	Interview on Midday News	$ 500.00
WIAT-TV			Air Quality Forecast 35X @ $75 each	$ 2,625.00
WIAT-TV			Production of 2:00 minute interview	$ 1,000.00
WIAT-TV		62,900	Airing interview 6X	$ 3,000.00
TOTALS	234	2,134,900		$ 8,725.00

TABLE 13
Detailed Delivery by ABC33/40

Station	# of spots	Impressions	Added Value Description	Added Value
WBMA-TV	98	1,426,500	23 spots at no charge (value of $50)	$ 1,150.00
WBMA-TV		7,900	Interview on Talk of Alabama	$ 500.00
WBMA-TV			Air Quality Forecast 35X @ $75 each	$ 2,625.00
TOTALS	98	1,434,400		$ 4,275.00

PRINT AND DIGITAL

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

Banner ads appeared on the ABC3340 Weather App that delivered 141,222 impressions.

Starnes Media produces and distributes publications in local communities throughout Jefferson and Shelby Counties, including Hoover, Homewood, 280 Corridor, Vestavia, and downtown Birmingham. In addition to print, Starnes sends out a daily email blast to each of these targeted areas. Digital ads were featured throughout the campaign, featuring Air Quality Awareness Tips through daily email blasts targeting these communities. A total of 4 ads ran throughout the campaign that provided clean air tips. APCA was given the non-profit rate of 50% of the rate card for a **value of $1,000.00**.
Total Opens/Views = 127,718 Total Clicks = 468

TABLE 14
Starnes Digital Impressions

Publication	Opens/Views	Click-throughs
280 Living	12,863	108
Hoover Sun	66,022	94
Homewood Star	17,808	40
Vestavia Voice	19,800	209
Village Living	11,225	17
	127,718	468

The Birmingham Times Media Group, Inc. The Birmingham Times is a weekly newspaper distributed throughout Jefferson County focusing on the African American community. A total of 4 quarter-page full-color ads ran on 7/13, 7/20, 7/27, and 8/10. In addition to the discounted rate for the ads, BT Group featured weekly digital ads on www.birminghamtimes.com.
Total Added Value = $800.00

TABLE 15
Marketing Campaign Overview

STATION	Total # of ads	Impressions	Added Value
WBRC	185	6,178,100	$ 12,625.00
BOUNCE	50	50,000	$ 500.00
WIAT-TV	234	2,134,900	$ 8,725.00
WBMA-TV	98	1,434,400	$ 4,275.00
Radio			
BMR	Interview	750	$ 500.00
Digital/Print			
The Birmingham Times	4 ¼ page ads & online	80,000	$ 800.00
Starnes Publishing	100 digital ads	127,718	$ 1,000.00
Weather App	Banner ads on the app	141,222	
Total		**10,147,090**	**$ 28,425.00**

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 2022 to September 2023, 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 95 community events and two corporate events. Advanced Consulting also had 6,198 pledge cards signed

Community Events

DATE	EVENT	ATTENDEES	PLEDGE CARDS
October 2022			
Oct 1	Bham Lib Comm Resource	700	59
Oct 1	Whistle Stop	700	109
Oct 4	Shelby County Night Out	300	62
Oct 4	Center Point Night Out	300	46
Oct 6	Titusville Comm Outreach	100	30
Oct 8	Shelby Iron Works	500	64
Oct 8	Eastlake Farmer's Market	100	31
Oct 13	Shelby County Senior HF	100	50
Oct 14	Evonik Corp Business	100	42
Oct 15	Off the Beaten Path Pop Up	200	54
Oct 15	Zion Star Health Fair	200	60
Oct 20	Comm HF Brownsville	100	29

DATE	EVENT	ATTENDEES	PLEDGE CARDS
Oct 22	Pelham Fall Festival	500	99
Oct 22	St. Mary's Com HF	200	86
Oct 26	Pinson FM	200	36
Oct 30	Barking at the Moon/Fultondale	300	78
November 2022			
Nov 2	Titusville Senior Day	100	32
Nov 5	Bark in the Park Alabaster	300	78
Nov 5	Helena Holiday Market	200	43
Nov 8	Archwell HF	100	28
Nov 12	Harpersville Day	700	86
Nov 12	Comm HF 1st United Cumb Pres	100	34
Nov 16	Evonik Corporate Business	100	21
December 2022			
Dec 3	Cahabazaar Christmas Fest	500	106
Dec 7	Titusville Senior Resource	100	33
Dec 11	Woodlawn	200	51
Dec 11	Ora Labora Christmas Market	100	29
Dec 14	Bessemer Health Fair	200	101
January 2023			
Jan 4	Titusville HF	100	52
February 2023			
Feb 21	Archwell Open House	100	23

DATE	EVENT	ATTENDEES	PLEDGE CARDS
March 2023			
March 4	Cahaba Night Bazaar	300	76
March 9	Titusville Resource Fair	200	40
March 11	Helena Spring Market	200	68
March 18	Off the Beaten Path	100	63
March 25	Fairfield Health Fair	100	102
March 31	Reg Lib & Arts Council Spring	150	29
April 2023			
April 1	Reg Library & Arts Council Spring	200	58
April 1	Cahaba Night Bazaar	200	64
April 2	Pelham Paws in the Park	200	72
April 5	Titusville Senior Comm Day	100	43
April 6	Senior Easter Egg Hunt	300	111
April 15	Pepper Place	500	121
April 20	Montevallo Earth Day	200	49
April 22	Strawberry Festival	200	36
April 22	Vincent Comm HF	200	72
April 29	Hoover Day	500	84
April 30	Warrior Spring Fest	200	65
May 2023			
May 3	Titusville Resource Day	100	33
May 6	Bessemer Train Station	300	87

DATE	EVENT	ATTENDEES	PLEDGE CARDS
May 6	HCPC Bazaar	200	52
May 10	Comm Health Fair Ishkooda	200	88
May 13	Cahaba Brewery Mother's Day Event.	500	116
May 13	Eastlake Farmer's Market	100	28
May 20	Eastside Health Expo	200	91
May 20	Trussville Farmer's Market	200	56
May 26	Pinson Farmer's Market	100	42
May 27	Bessemer Farmer's Market	100	47
June 2023			
June 1	Archwell Roebuck Celebrate Dads	100	39
June 4	Vulcan Birthday Bash	500	119
June 6	West Homewood Park	200	53
June 7	Shelby County Senior Picnic	300	111
June 8	Titusville Comm Resource Day	100	33
June 10	Eastlake Fishing Rodeo	200	93
June 15	World Elder Abuse Comm Awareness	200	68
June 17	Lee Branch	200	48
June 19	Montevallo FM	100	40
June 22	I Love America Night	500	106
June 24	Vincent Founder's Day	200	39
June 24	Cahabazaar	300	96
June 30	Senior Swim Party	300	128

DATE	EVENT	ATTENDEES	PLEDGE CARDS
July 2023			
July 6	Titusville Senior Resource Fair	200	68
July 10	Lake Wilbon Farmer's Market	200	46
July 12	West Homewood	200	43
July 1	Made in Shade/ Shelby Ironworks	200	54
July5	Titusville Senior Resource Fair	200	40
July 11	West Homewood	200	51
July 17	Montevallo Farmer's Market	200	27
July 22	Lee Branch	200	20
July 29	Back to School Event/ Fairfield	300	123
August 20223			
Aug 1	West Homewood	200	57
Aug 7	New Hope Senior Welcome	200	62
Aug 9	Center Point Health & Wellness	200	41
Aug 12	Pepper Place	500	108
Aug 12	Helena Farmer's Market	100	39
Aug 19	Lee Branch Farmer's Market	200	42
Aug 19	Alabaster City Health Fair	200	88
Aug 25	Pinson FM	100	38
Aug 26	Valleydale FM	200	62
September 2023			
Sept 2	Trussville Farmer's Market	200	49

DATE	EVENT	ATTENDEES	PLEDGE CARDS
Sept 6	Titusville Senior Expo	100	44
Sept 7	Vestavia Health & Wellness	200	71
Sept 9	Birdsong Farmer's Market	100	31
Sept 14	Complete Health	100	90
Sept 16	Wellness Fair Hueytown	100	29
Sept 16	Off the Beaten Path Pop Up	200	54
Sept 21	Recovery Response Fair	100	32
Sept 22	TSAC Shred Learn Wellness Fair	200	69
Sept 29	Pinson Farmer's Marke	100	38
Sept 30	Harpersville Day	300	44
Sept 30	Pepper Place/ Clean Fuels Event	200	57

SECTION 6

SCIENCE AND ENVIRONMENTAL EDUCATION OUTREACH

The Johnson Management Group (JMG works with Alabama Partners for Clean Air on science and environmental education outreach in Jefferson and Shelby County school districts.

JMG conducted 52 audits between Fall 2022 and September 2023. The following schools were included: Wylam; West End; Hemphill; Minor Community; Center Point; Lipscomb; Hemphill; Center Point; Erwin; Phillips; Glen Iris; I 3 Academy; Washington K-8; Jackson Olin; Erwin Middle; Jones Valley; Phillips Academy; Leeds High School; Huffman Middle; Hard School; Princeton; Center Point; Green Acres; Sun Valley; Glen Oaks; CJ Donald; Robinson; Smith Middle; Minor Elementary; Martha Gaskins; McAdory High; Arrington; Woodlawn High; Pinson Valley; Clay-Chalkville; Minor High; Hueytown; West End; Phillips; Huffman Academy; Ossie Ware Mitchell; Wenonah; Jackson Olin; Princeton; Ephesus; Phillips; Oxmoor Valley; Wilkerson; Huffman Middle; Smith Middle; Central Park and Jackson Olin.

The audits yielded 4,289 pieces of APCA literature being handed out and 1,271 cars shutting off because of the message to turn the key and be idle-free.

The following graphs summarize the vehicle audits for Birmingham City Schools from October 2022 through December 2022; JMG conducted 13 audits. Total outreach was 918, with 301 parents in compliance at 13 schools. (See Figure 2-4).

FIGURE 2
JMG Vehicle Audits and Compliance October 2022

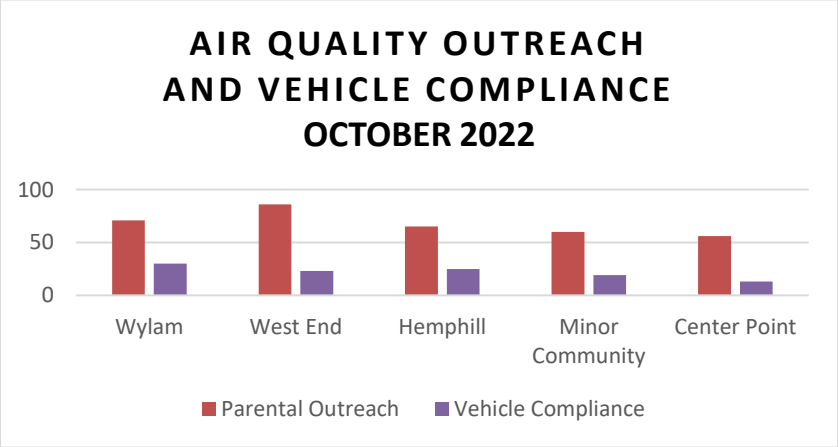


FIGURE 3
JMG Vehicle Audits and Compliance November 2022

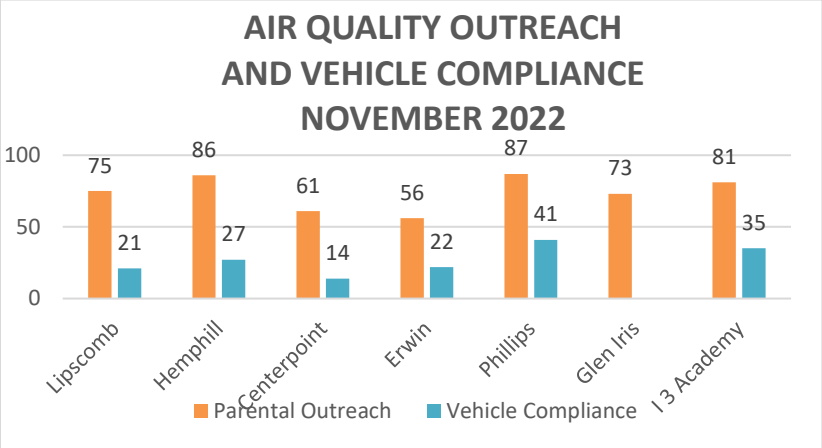
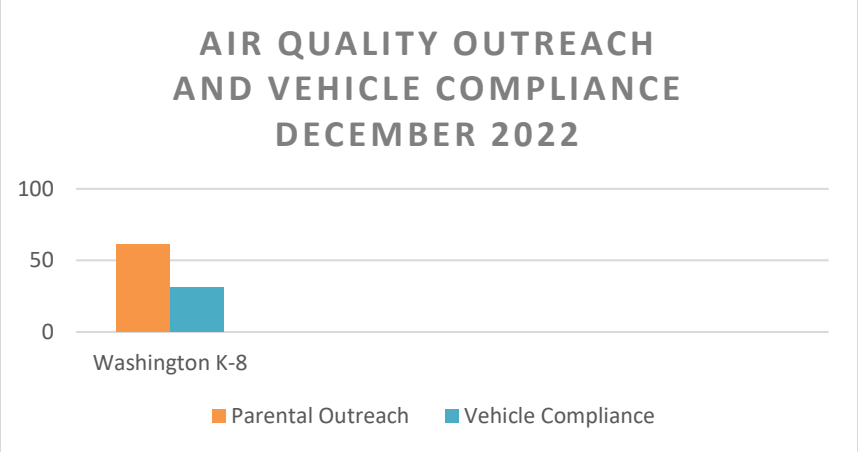


FIGURE 4
JMG Vehicle Audits and Compliance December 2022



The following graphs summarize the vehicle audits for Birmingham City Schools from January 2023 through September 2023; JMG conducted 39 audits. Total outreach was 3,371, with 970 parents in compliance at 37 schools. (See Figure 5 -13).

FIGURE 5
JMG Vehicle Audits and Compliance January 2023

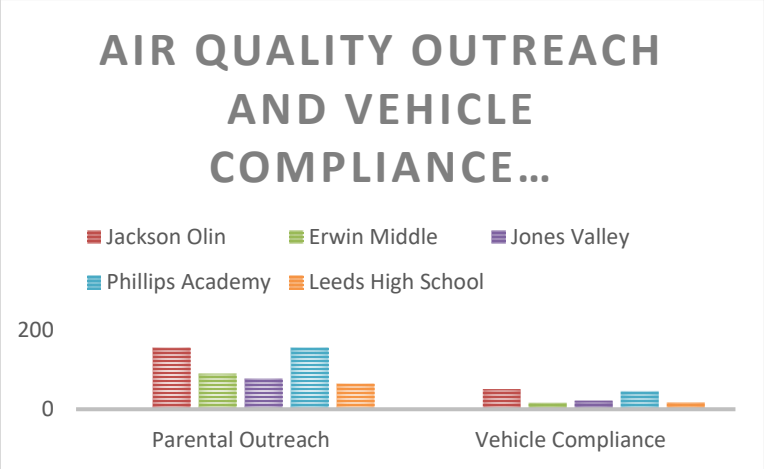


FIGURE 6
JMG Vehicle Audits and Compliance February 2023

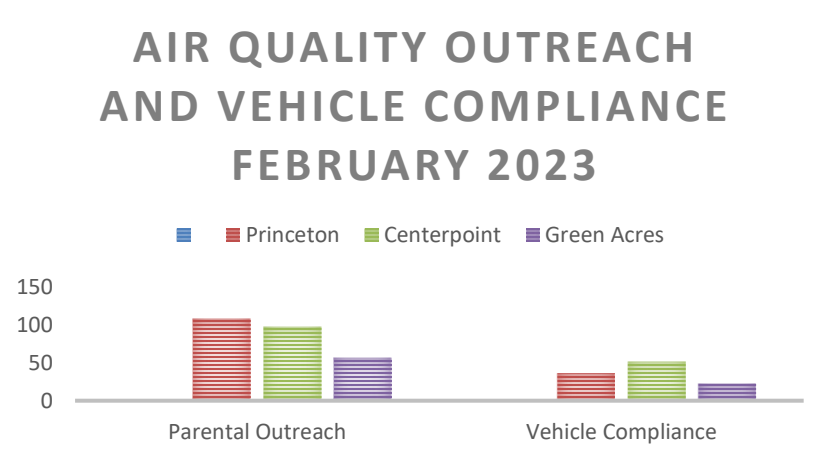


FIGURE 7
JMG Vehicle Audits and Compliance March 2023

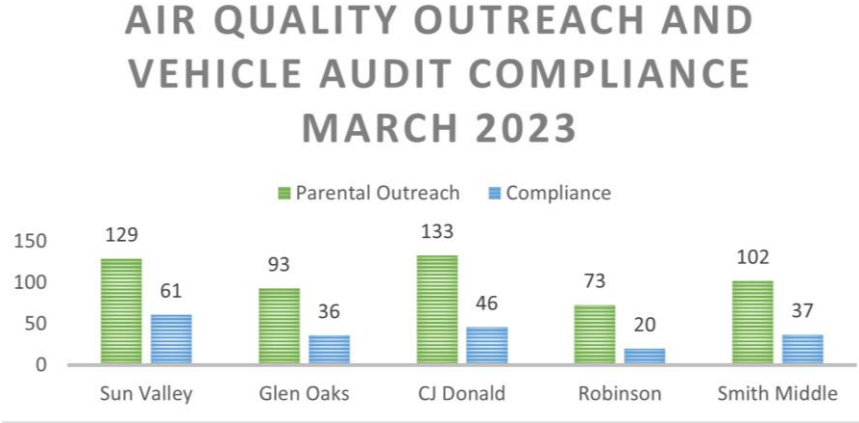


FIGURE 8
JMG Vehicle Audits and Compliance April 2023

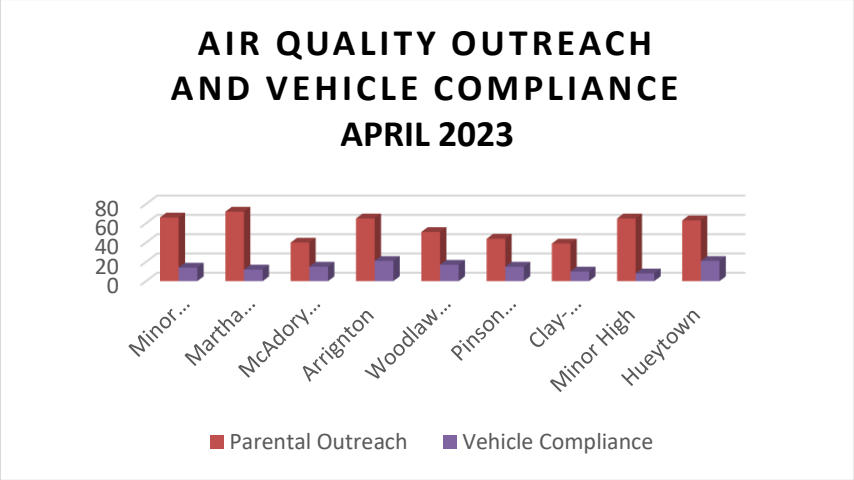


FIGURE 9
JMG Vehicle Audits and Compliance May – June 2023

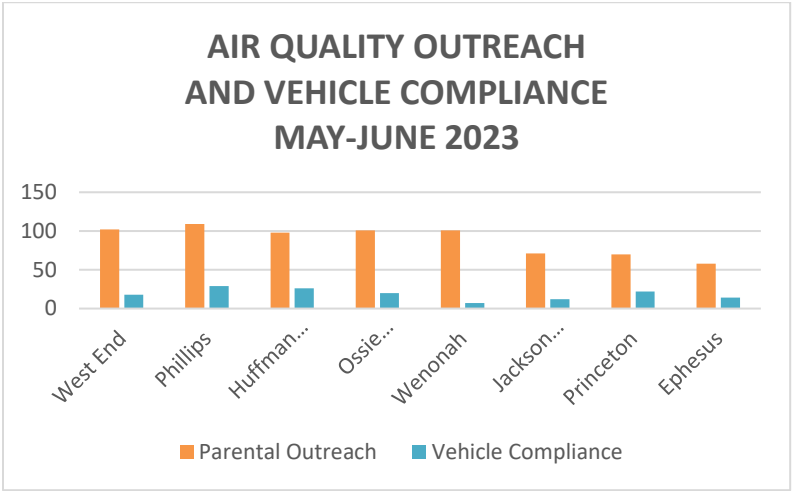


FIGURE 10
JMG Vehicle Audits and Compliance August 2023

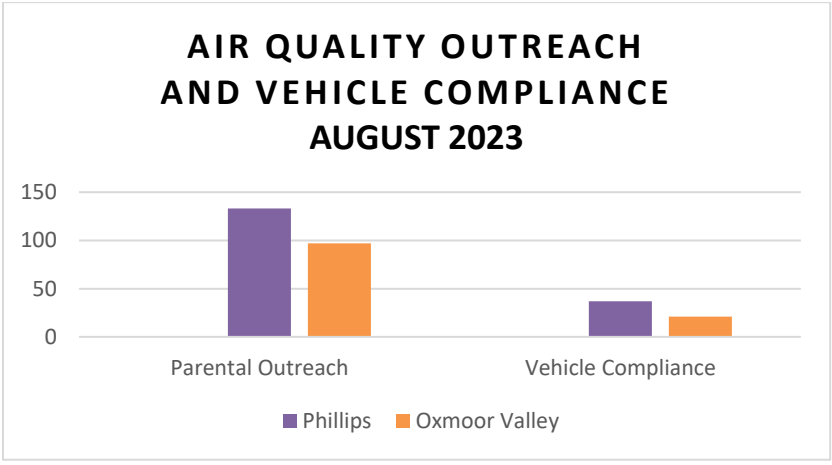
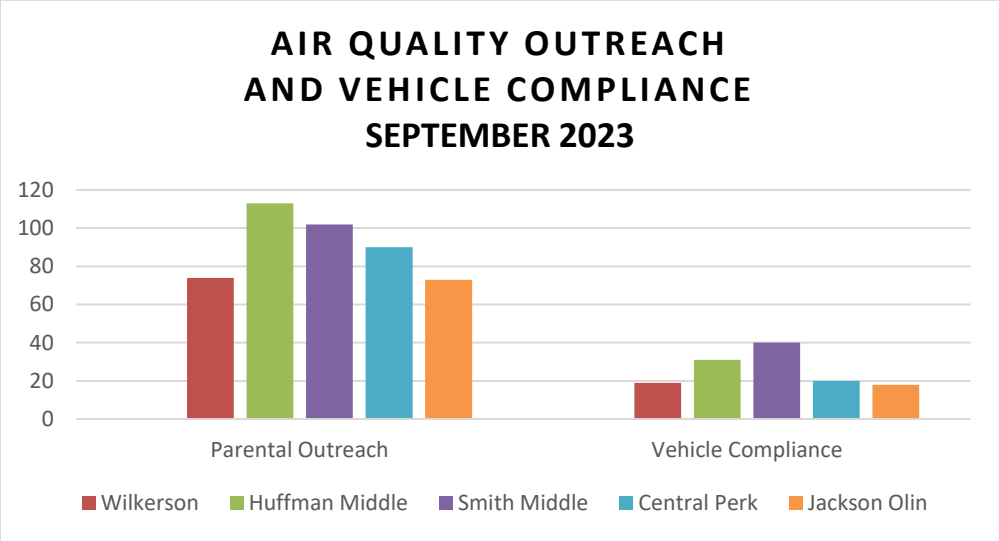


FIGURE 11
JMG Vehicle Audits and Compliance September 2023



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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 FY2023, alternative fuel usage in Jefferson and Shelby Counties totaled 3,271,095 gallons or GGE's (gasoline gallon equivalent). This included approximately 89,386 gallons of E85 Ethanol; 168,615 GGE's of Propane, 1,475,611 GGE's of CNG, 1,537,483 GGE's of electricity representing about 35.3 million electric miles driven (BEV and PHEV). These cleaner burning fuels and idle reduction technologies provided 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 10.83% from FY2021, 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), Veal Convention Services (Propane), Evergreen Transportation (CNG), Groome Transportation (Propane), Melton Automotive (CNG), Lawson State Community College (CNG), Birmingham City Schools (Propane), Waste Management (CNG), Spire Alabama - formerly Alabama Gas Corporation (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 and Shelby County at the

Highway 280 Shell near Valleydale Road. CNG also continued to be available at the Birmingham-Jefferson County Transit Authority's public access CNG refueling station in Birmingham, at a private CNG fueling station at the Birmingham International Airport (CNG), and at Evergreen Transportation in Calera (CNG), LNG continued to be available throughout the reporting period at the Clean Energy Fuels station on Daniel Payne Drive, however the company, as a matter of corporate policy, would not provide fuel usage information for this station, which has 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. 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.

The Alabama Clean Fuels Coalition partnered with several entities on projects to install publicly accessible electric vehicle charging infrastructure projects. Through partnerships with the City of Montevallo, the Birmingham Parking Authority, and the HUB Community Development Corporation, new Level 2 charging stations are now operational in downtown Birmingham in Jefferson County and downtown Montevallo in Shelby County.

FIGURE 12
Picture of Montevallo Project

ACFC Executive Director Mark Bentley is on the left, and Montevallo Mayor Rusty Nix is on the right. They are charging EVs at a ribbon cutting in downtown Montevallo on September 14, 2023.

FIGURE 13
Picture of Birmingham Parking Authority Hub Project

Birmingham Parking Authority Executive Director and CEO André Davis, left, City of Birmingham Department of Transportation's Christina Argo, middle, and Birmingham City Council President Darrell O'Quinn Chief of Staff Myeisha Hutchinson, right, at a ribbon cutting in the Avondale neighborhood on October 18, 2023.

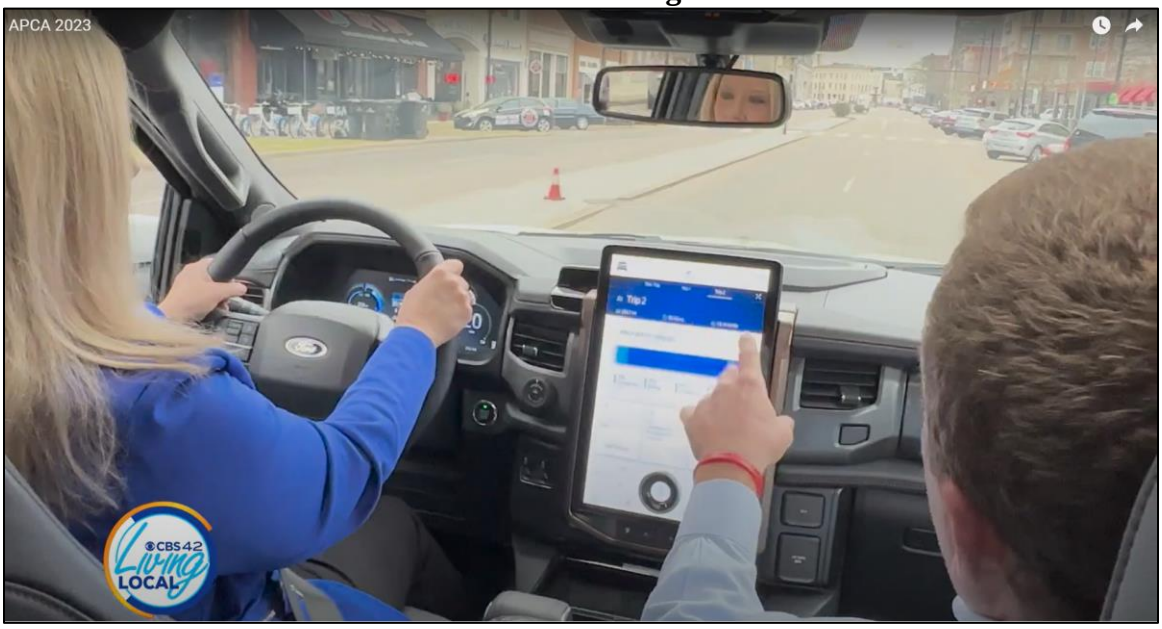
ACFC mailed letters to each Jefferson and Shelby County mayor to offer to meet with them during the FY23 APCA cycle. Given all the new funding opportunities for alternative fuel infrastructure and vehicles, it is essential to ensure that communities know their options. We have received responses from Wilton, Vestavia Hills, and Pleasant Grove. ACFC always offers to meet with any city or county officials who request to discuss opportunities related to alternative transportation fuels.

ACFC met with the City of Birmingham Transportation Department on January 23 to discuss EV charging infrastructure funding opportunities.

ACFC planned to have a heavy presence related to Drive Electric Alabama at the Alabama Auto Show. Unfortunately, this 2023 event was canceled.

ACFC participated in a CBS 42 project with filming at Railroad Park on June 27. We brought an electric F150, and ACFC's President was interviewed to highlight the advantages of owning an EV. ACFC also provided stock footage to the news showing people driving an electric pickup truck.

FIGURE 14
Picture of CS42 Segment



ACFC has organized an EV showcase at Pepper Place Market on Saturday, September 30, 2023. A total of 28 EVs were showcased by their owners, who answered consumers' questions about Driving Electric. An estimated 300 folks visited and interacted with the owners. APCA was represented, and Brenda Peterson distributed the material.

FIGURE 15
Picture of Pepper Place Market Event

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
TABLE 16
Emission Reductions by Program from October 1, 2022, to September 30, 2023

TIP FY2023 CMAQ Ozone Program Project Potential Emissions Reductions

#	Project	Emissions, lbs./Day			# of	
		VOC	NOx	$PM_{2.5}$	Days	Note
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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ALABAMA PARTNERS FOR CLEAN AIR
VOLUNTARY AIR QUALITY PROGRAM
CMAQ-NR21, PROJECT # 100073252

ALABAMA CLEAN FUELS COALITION, INC.
FY 2023 ANNUAL REPORT
OCTOBER 1, 2022 – SEPTEMBER 30, 2023

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:

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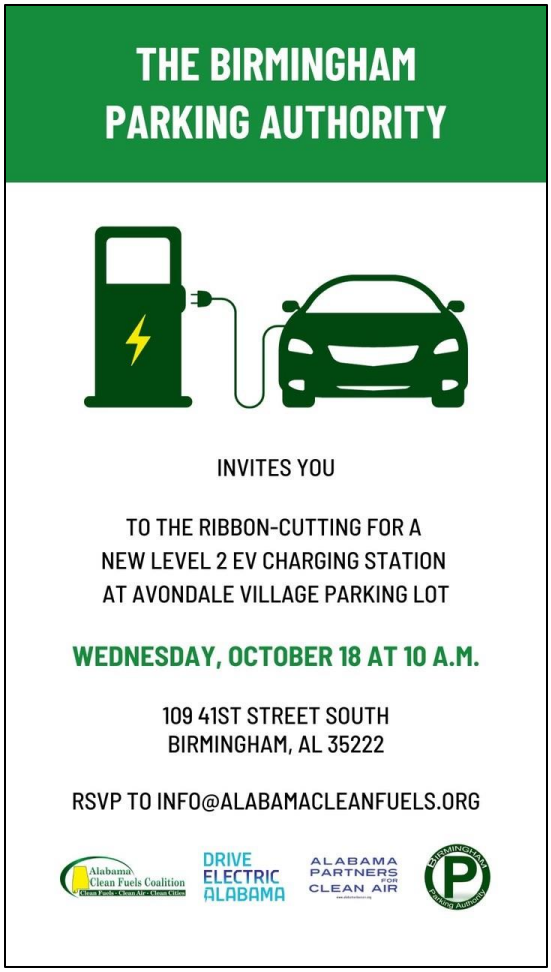

ACFC mailed letters to each Jefferson and Shelby County mayor to offer to meet with them during the FY23 APCA cycle. Given all the new funding opportunities for alternative fuel infrastructure and vehicles it is important to ensure that communities are aware of the opportunities available to them. We have received responses from Wilton, Vestavia Hills, and Pleasant Grove. ACFC always offers to meet with any city or county officials who request to discuss opportunities related to alternative transportation fuels.

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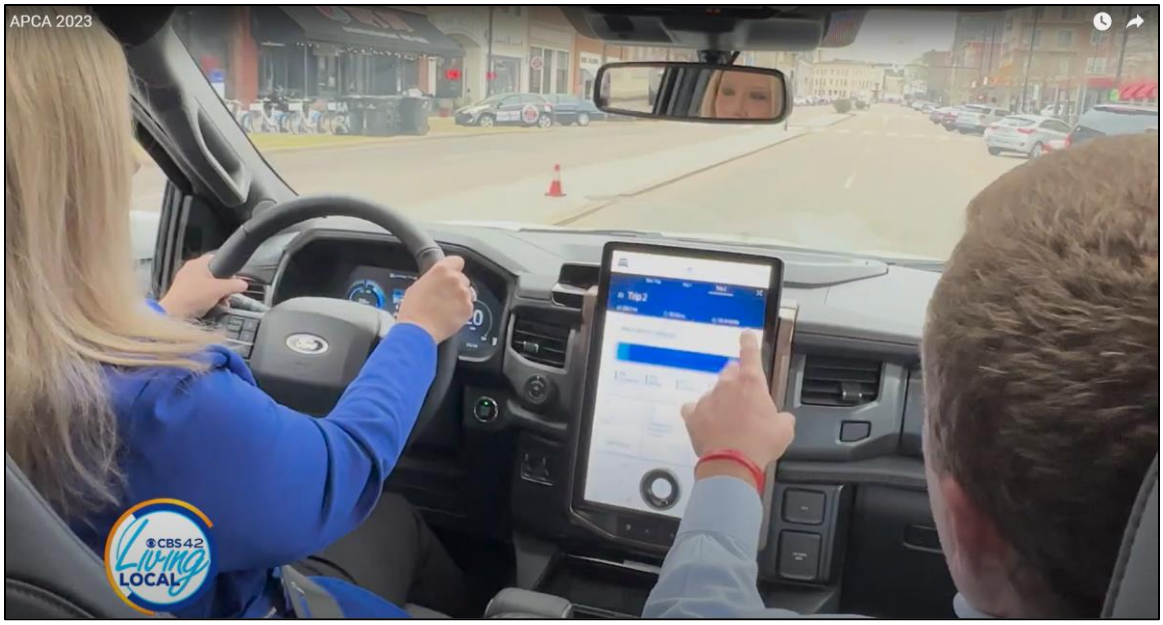

CBS42 Living Local Segment (2023)

ACFC has organized an EV showcase at Pepper Place Market on Saturday, September 30, 2023. A total of 28 EVs were showcased by their owners who answered consumers questions about Driving Electric. An estimated 300 folks visited and interacted with the owners. APCA was represented, and material distributed, by Brenda Peterson.


EV showcase at Pepper Place Market on Saturday, September 30, 2023

ACFC continues working very closely with the State of Alabama and other stakeholders to assist with EV infrastructure planning and awareness efforts throughout the state. To learn more, review the plan, or provide public input please visit https://adeca.alabama.gov/ev/.

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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 2022– SEPTEMBER 2023

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. 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 (O_3) during the period October 2022 – September 2023. "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 O_3 forecasts during the warm season (approximately mid-April to mid-October) every year. 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
6/9/2023	Orange	Orange	O_3
6/28/2023	Orange	Orange	O_3
6/29/2023	Orange	Orange	O_3
6/30/2023	Orange	Yellow	O_3
7/18/2023	Orange	Yellow	$PM_{2.5}$
7/25/2023	Orange	Yellow	O_3

7/26/2023	Orange	Orange	O_3
7/28/2023	Orange	Yellow	O_3

Contracts

As part of the larger Memorandum of Agreement between the RPC and JCDH for FY2023 (October 2022 – September 2023), 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.

	OCT 2022 – SEP 2023
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 $\mu g/m^3$). Effective April 15, 2015, the EPA designated the Birmingham area as attainment of the 2013 annual $PM_{2.5}$ standard (12 $\mu g/m^3$). The Birmingham area is currently designated as attainment of all of EPA's National Ambient Air Quality Standards through calendar year 2022.

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 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, 2022 – September 30, 2023).

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 2020-2022. The ozone monitoring network consists of 6 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 2020-2022, no monitors violated the standard.

8-Hour Ozone Design Values (2020-2022)	
Monitor	**Design Value (ppb)**
Corner	60
Fairfield	63
Helena	61
Leeds	*
McAdory	62
North Birmingham	63
Tarrant	60

*Due to not meeting data completeness criteria, the design value is not valid

Fine Particulate Matter ($PM_{2.5}$)

Effective March 18, 2013, the EPA lowered the annual $PM_{2.5}$ standard to 12 µg/m^3. 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/m^3. The most recent 3-year monitoring period was 2020-2022. 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. There were no violations of the annual and 24-hour $PM_{2.5}$ standards for 2020-2022.

Annual $PM_{2.5}$ Design Values (2020-2022)	
Monitor	**Design Value (µg/m^3)**
Arkadelphia	*
Leeds	8.4
McAdory	8.1
North Birmingham	9.5
Wylam	8.2

*Due to not meeting data completeness criteria, the design value is not valid

24-Hour $PM_{2.5}$ Design Values (2020-2022)	
Monitor	**Design Value ($\mu g/m^3$)**
Arkadelphia	*
Leeds	18
McAdory	17
North Birmingham	17
Wylam	18

*Due to not meeting data completeness criteria, the design value is not valid

Air Quality Exceedances

Below are tables showing the exceedances of the 8-hour ozone standard from 2013 through 2022 and exceedances of the 24-hour $PM_{2.5}$ standard from 2013 through 2022. Note that the EPA lowered the 8-hour ozone standard in 2015 so there was a lower threshold to violate the standard. The two 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 2013-2022

Station	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Corner	1	0	0	1	0	0	1	0	0	1
Fairfield	0	0	2	2	0	1	7	0	0	0
Helena	0	1	2	4	0	1	3	0	0	1
Hoover	0	0	2	2	0					
Leeds	0	0	0	1	0	1	1	0	0	0
McAdory	0	0	0	2	0	1	5	0	0	0
N. Birmingham	0	0	4	3	1	2	4	0	1	1
Tarrant	1	0	4	3	1	3	2	1	0	0
Total	**2**	**1**	**14**	**18**	**2**	**9**	**23**	**1**	**1**	**3**

Exceedances of the 24-Hour Fine Particulate Matter ($PM_{2.5}$) Standard for 2013-2022

Station	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Arkadelphia		0	0	0	0	0	0	1	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	0	1	0	0
Wylam	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**

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Appendix C
Advance Consulting, LLC.
Annual Report

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Advanced Consulting Annual Report

October 1, 2022 – September 30, 2023

Total Community Events: **95**

Total Corporate Events: **2**

Total Events: **97**

Total Pledge Cards from Community Events: **6,135**

Total Pledge Cards from Corporate Events: **63**

TOTAL PLEDGES CARDS: **6,198**

Events

	Event	Attendees	Pledge Cards
October 2022			
Oct 1	Bham Lib Comm Resource	700	59
Oct 1	Whistle Stop	700	109
Oct 4	Shelby County Night Out	300	62
Oct 4	Center Point Night Out	300	46
Oct 6	Titusville Comm Outreach	100	30
Oct 8	Shelby Iron Works	500	64
Oct 8	Eastlake Farmer's Market	100	31
Oct 13	Shelby County Senior HF	100	50
Oct 14	Evonik Corp Business	100	42
Oct 15	Off the Beaten Path Pop Up	200	54
Oct 15	Zion Star Health Fair	200	60
Oct 20	Comm HF Brownsville	100	29

Oct 22	Pelham Fall Festival	500	99
Oct 22	St. Mary's Com HF	200	86
Oct 26	Pinson FM	200	36
Oct 30	Barking at the Moon/Fultondale	300	78
November 2022			
Nov 2	Titusville Senior Day	100	32
Nov 5	Bark in the Park Alabaster	300	78
Nov 5	Helena Holiday Market	200	43
Nov 8	Archwell HF	100	28
Nov 12	Harpersville Day	700	86
Nov 12	Comm HF 1st United Cumb Pres	100	34
Nov 16	Evonik Corporate Business	100	21
December 2022			
Dec 3	Cahabazaar Christmas Fest	500	106
Dec 7	Titusville Senior Resource	100	33
Dec 11	Woodlawn	200	51
Dec 11	Ora Labora Christmas Market	100	29
Dec 14	Bessemer Health Fair	200	101
January 2023			
Jan 4	Titusville HF	100	52
February 2023			
Feb 21	Archwell Open House	100	23
March 2023			

March 4	Cahaba Night Bazaar	300	76
March 9	Titusville Resource Fair	200	40
March 11	Helena Spring Market	200	68
March 18	Off the Beaten Path	100	63
March 25	Fairfield Health Fair	100	102
March 31	Reg Lib & Arts Council Spring	150	29
April 2023			
April 1	Reg Library & Arts Council Spring	200	58
April 1	Cahaba Night Bazaar	200	64
April 2	Pelham Paws in the Park	200	72
April 5	Titusville Senior Comm Day	100	43
April 6	Senior Easter Egg Hunt	300	111
April 15	Pepper Place	500	121
April 20	Montevallo Earth Day	200	49
April 22	Strawberry Festival	200	36
April 22	Vincent Comm HF	200	72
April 29	Hoover Day	500	84
April 30	Warrior Spring Fest	200	65
May 2023			
May 3	Titusville Resource Day	100	33
May 6	Bessemer Train Station	300	87
May 6	HCPC Bazaar	200	52
May 10	Comm Health Fair Ishkooda	200	88

May13	Cahaba Brewery Mother's Day Event.	500	116
May 13	Eastlake Farmer's Market	100	28
May 20	Eastside Health Expo	200	91
May 20	Trussville Farmer's Market	200	56
May 26	Pinson Farmer's Market	100	42
May 27	Bessemer Farmer's Market	100	47
June 2023			
June 1	Archwell Roebuck Celebrate Dads	100	39
June 4	Vulcan Birthday Bash	500	119
June 6	West Homewood Park	200	53
June 7	Shelby County Senior Picnic	300	111
June 8	Titusville Comm Resource Day	100	33
June 10	Eastlake Fishing Rodeo	200	93
June 15	World Elder Abuse Comm Awareness	200	68
June 17	Lee Branch	200	48
June 19	Montevallo FM	100	40
June 22	I Love America Night	500	106
June 24	Vincent Founder's Day	200	39
June 24	Cahabazaar	300	96
June 30	Senior Swim Party	300	128
July 2023			
July 1	Made in Shade/ Shelby Ironworks	200	54
July5	Titusville Senior Resource Fair	200	40

July 11	West Homewood	200	51
July 17	Montevallo Farmer's Market	200	27
July 22	Lee Branch	200	20
July 29	Back to School Event/ Fairfield	300	123
August 2023			
Aug 1	West Homewood	200	57
Aug 7	New Hope Senior Welcome	200	62
Aug 9	Center Point Health & Wellness	200	41
Aug 12	Pepper Place	500	108
Aug 12	Helena Farmer's Market	100	39
Aug 19	Lee Branch Farmer's Market	200	42
Aug 19	Alabaster City Health Fair	200	88
Aug 25	Pinson FM	100	38
Aug 26	Valleydale FM	200	62
September 2023			
Sept 2	Trussville Farmer's Market	200	49
Sept 6	Titusville Senior Expo	100	44
Sept 7	Vestavia Health & Wellness	200	71
Sept 9	Birdsong Farmer's Market	100	31
Sept 14	Complete Health	100	90
Sept 16	Wellness Fair Hueytown	100	29
Sept 16	Off the Beaten Path Pop Up	200	54
Sept 21	Recovery Response Fair	100	32

Sept 22	TSAC Shred Learn Wellness Fair	200	69
Sept 29	Pinson Farmer’s Marke	100	38
Sept 30	Harpersville Day	300	44
Sept 30	Pepper Place/ Clean Fuels Event	200	57

Appendix D
Emissions Reductions Worksheets

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Emission Reductions by Ozone Awareness Program from October 1, 2022, to September 30, 2023

TIP FY2023 CMAQ Ozone Program Project Potential Emissions Reductions

#	Project	Emissions, lbs./Day			# of	
		VOC	NOx	$PM_{2.5}$	Days	Note
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 Awarer	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.

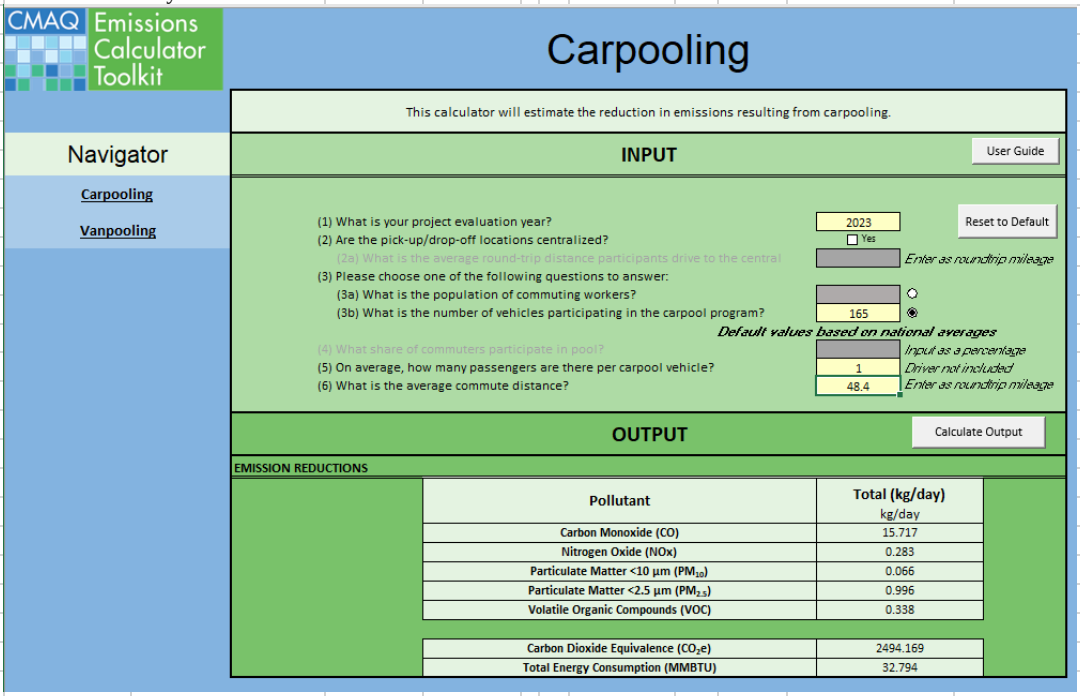
[3] A Survey of Jefferson and Shelby County Resident Attitudes and Actions, submitted by Connections, Inc.

[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.

Emissions Reductions in kilograms per day based on FHWA CMAQ Emissions Calculator Toolkit

In Jefferson County



CMAQ Emissions Calculator Toolkit

Carpooling

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

Navigator

Carpooling

Vanpooling

INPUT User Guide

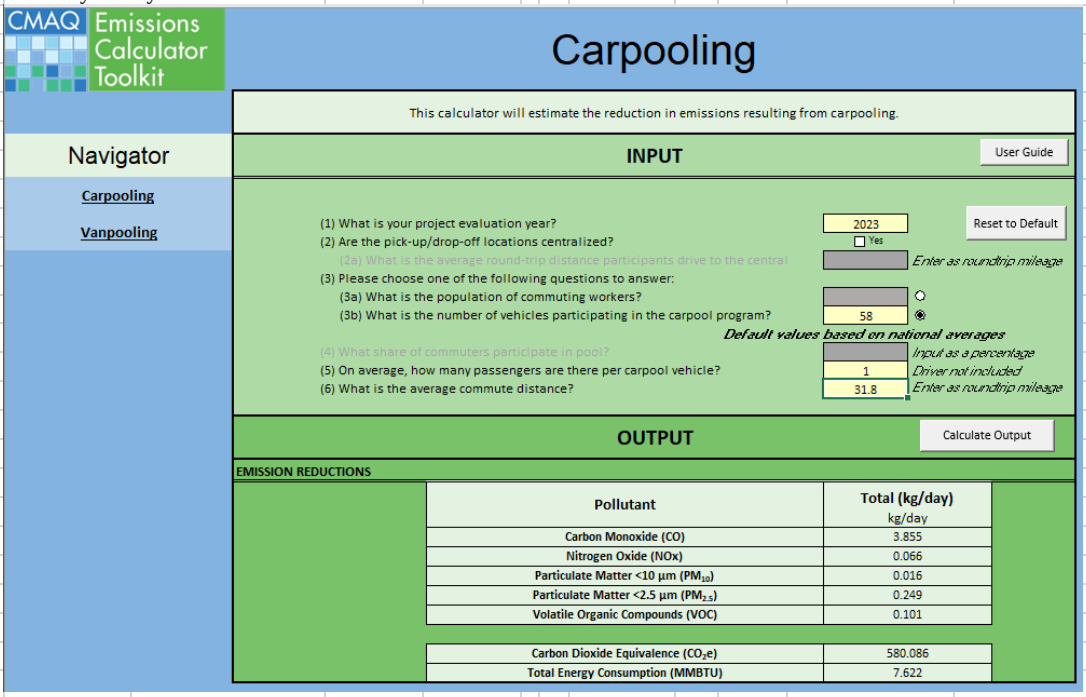
(1) What is your project evaluation year?	2023	Reset to Default
(2) Are the pick-up/drop-off locations centralized?	☐ Yes	
(2a) What is the average round-trip distance participants drive to the central		*Enter as roundtrip mileage*
(3) Please choose one of the following questions to answer:		
(3a) What is the population of commuting workers?		○
(3b) What is the number of vehicles participating in the carpool program?	165	◉
Default values based on national averages		
(4) What share of commuters participate in pool?		*Input as a percentage*
(5) On average, how many passengers are there per carpool vehicle?	1	*Driver not included*
(6) What is the average commute distance?	48.4	*Enter as roundtrip mileage*

OUTPUT Calculate Output

EMISSION REDUCTIONS

Pollutant	Total (kg/day) 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_2e)	2494.169
Total Energy Consumption (MMBTU)	32.794

In Shelby County



CMAQ Emissions Calculator Toolkit

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?	2023	Reset to Default
(2) Are the pick-up/drop-off locations centralized?	☐ Yes	
(2a) What is the average round-trip distance participants drive to the central		*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?	58	◉
Default values based on national averages		
(4) What share of commuters participate in pool?		*Input as a percentage*
(5) On average, how many passengers are there per carpool vehicle?	1	*Driver not included*
(6) What is the average commute distance?	31.8	*Enter as roundtrip mileage*

OUTPUT Calculate Output

EMISSION REDUCTIONS

Pollutant	Total (kg/day) 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_2e)	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 Hyb	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, Noxbux	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

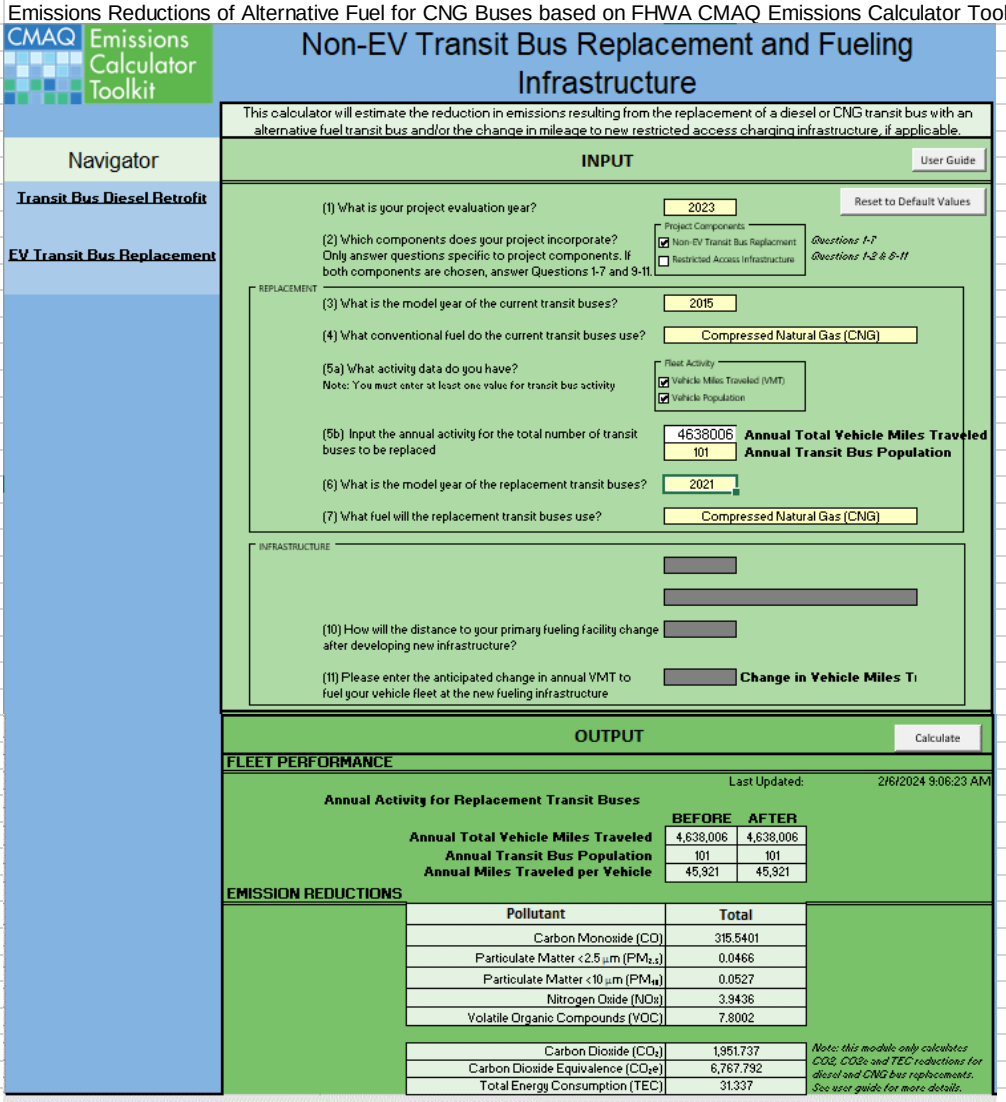
[1] APCA Alternative Fuel Summary 2023

[2] (Estimated Vehicle Miles Traveled) = (Gasoline gallon equivalent) x (Miles per gallon)

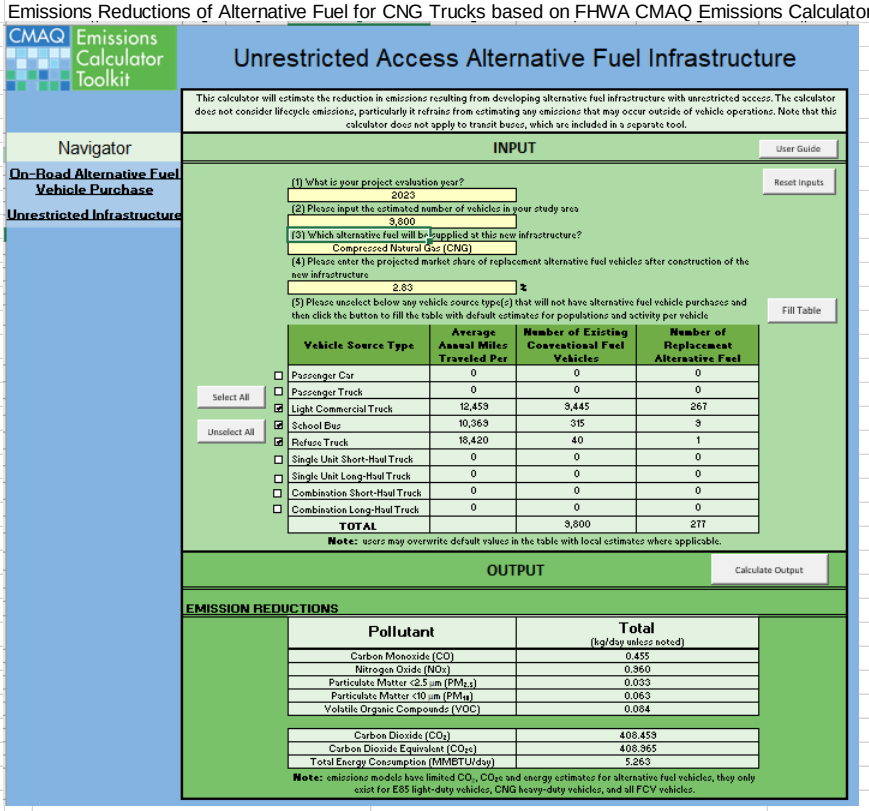
[3], [4], [5] FHWA CMAQ Emissions Calculator Toolkit

[6] Total project cost = Federal funds + local matches if needed

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



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



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 — Reset Inputs

(1) What is your project evaluation year?
2023

(2) Please input the estimated number of vehicles in your study area
3,800

(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
2.83 %

(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

Select All — Unselect All

	Vehicle Source Type	Average Annual Miles Traveled Per	Number of Existing Conventional Fuel Vehicles	Number of Replacement Alternative Fuel
☐	Passenger Car	0	0	0
☐	Passenger Truck	0	0	0
☑	Light Commercial Truck	12,459	3,445	267
☑	School Bus	10,369	315	9
☑	Refuse Truck	18,420	40	1
☐	Single Unit Short-Haul Truck	0	0	0
☐	Single Unit Long-Haul Truck	0	0	0
☐	Combination Short-Haul Truck	0	0	0
☐	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.

OUTPUT — Calculate Output

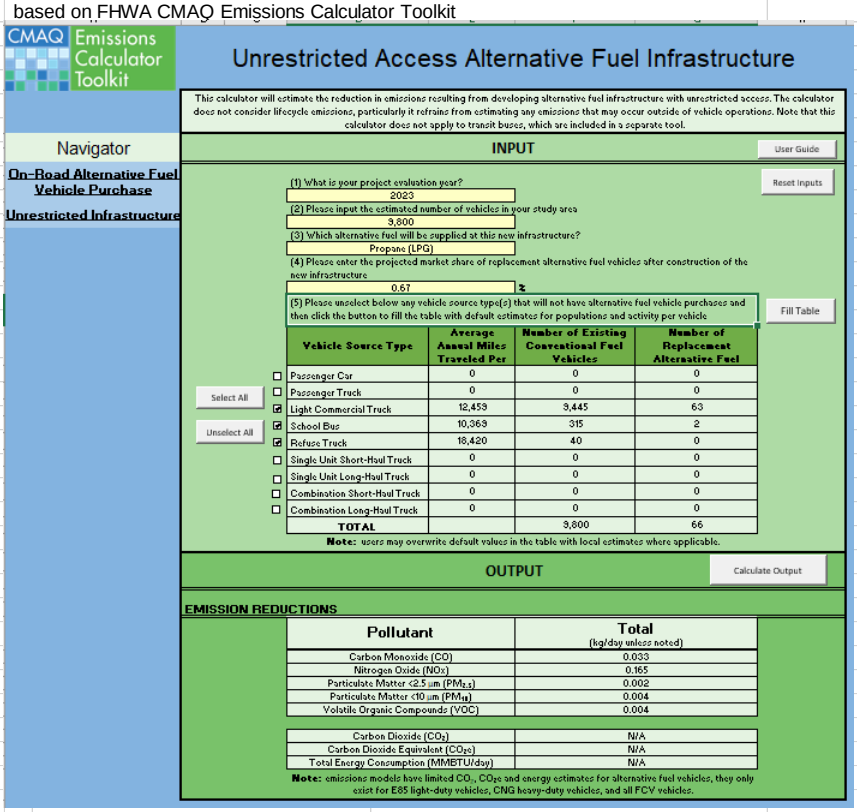
EMISSION REDUCTIONS

Pollutant	Total (kg/day 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)	0.084

Carbon Dioxide (CO_2)	408.459
Carbon Dioxide Equivalent (CO_{2e})	408.365
Total Energy Consumption (MMBTU/day)	5.263

Note: emissions models have limited CO_2, CO_{2e} 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



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 — Reset Inputs

(1) What is your project evaluation year?
2023

(2) Please input the estimated number of vehicles in your study area
3,800

(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
0.67 %

(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

Select All — Unselect All

	Vehicle Source Type	Average Annual Miles Traveled Per	Number of Existing Conventional Fuel Vehicles	Number of Replacement Alternative Fuel
☐	Passenger Car	0	0	0
☐	Passenger Truck	0	0	0
☑	Light Commercial Truck	12,459	3,445	63
☑	School Bus	10,369	315	2
☑	Refuse Truck	18,420	40	0
☐	Single Unit Short-Haul Truck	0	0	0
☐	Single Unit Long-Haul Truck	0	0	0
☐	Combination Short-Haul Truck	0	0	0
☐	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.

OUTPUT — Calculate Output

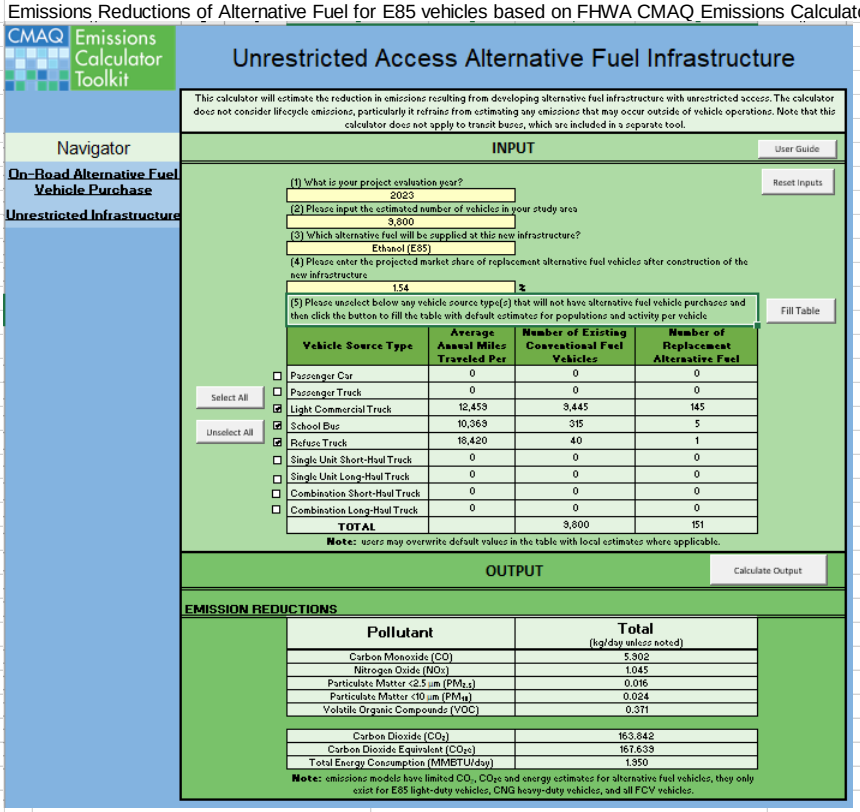
EMISSION REDUCTIONS

Pollutant	Total (kg/day 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_{2e})	N/A
Total Energy Consumption (MMBTU/day)	N/A

Note: emissions models have limited CO_2, CO_{2e} 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



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 — Reset Inputs

(1) What is your project evaluation year?: 2023

(2) Please input the estimated number of vehicles in your study area: 3,800

(3) Which alternative fuel will be supplied at this new infrastructure?: Ethanol (E85)

(4) Please enter the projected market share of replacement alternative fuel vehicles after construction of the new infrastructure: 1.54 %

(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

Select All — Unselect All

	Vehicle Source Type	Average Annual Miles Traveled Per	Number of Existing Conventional Fuel Vehicles	Number of Replacement Alternative Fuel
☐	Passenger Car	0	0	0
☐	Passenger Truck	0	0	0
☑	Light Commercial Truck	12,459	3,445	145
☑	School Bus	10,369	315	5
☑	Refuse Truck	18,420	40	1
☐	Single Unit Short-Haul Truck	0	0	0
☐	Single Unit Long-Haul Truck	0	0	0
☐	Combination Short-Haul Truck	0	0	0
☐	Combination Long-Haul Truck	0	0	0
	TOTAL		3,800	151

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

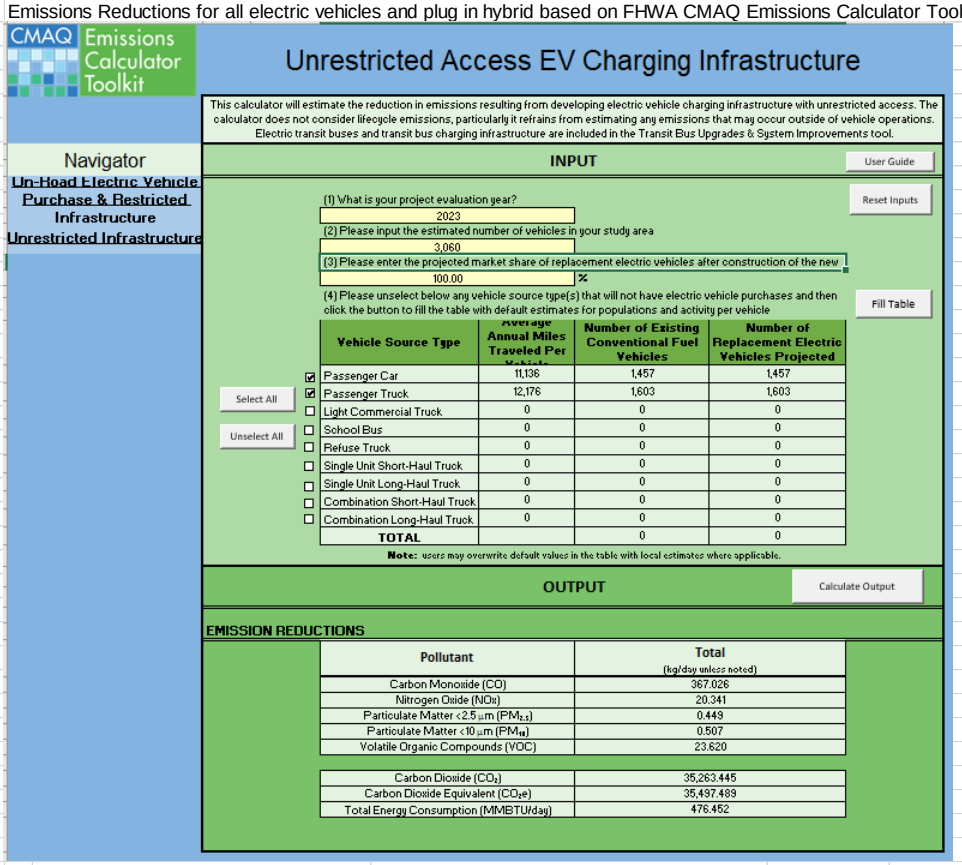
OUTPUT — Calculate Output

EMISSION REDUCTIONS

Pollutant	Total (kg/day unless noted)
Carbon Monoxide (CO)	5.302
Nitrogen Oxide (NO_x)	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_2e)	167.639
Total Energy Consumption (MMBTU/day)	1.950

Note: emissions models have limited CO_2, CO_2e 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



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

On-Road Electric Vehicle Purchase & Restricted Infrastructure

Unrestricted Infrastructure

INPUT — User Guide — Reset Inputs

(1) What is your project evaluation year?: 2023

(2) Please input the estimated number of vehicles in your study area: 3,060

(3) Please enter the projected market share of replacement electric vehicles after construction of the new: 100.00 %

(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 — Fill Table

Select All — Unselect All

	Vehicle Source Type	Average Annual Miles Traveled Per	Number of Existing Conventional Fuel Vehicles	Number of Replacement Electric Vehicles Projected
☑	Passenger Car	11,136	1,457	1,457
☑	Passenger Truck	12,176	1,603	1,603
☐	Light Commercial Truck	0	0	0
☐	School Bus	0	0	0
☐	Refuse Truck	0	0	0
☐	Single Unit Short-Haul Truck	0	0	0
☐	Single Unit Long-Haul Truck	0	0	0
☐	Combination Short-Haul Truck	0	0	0
☐	Combination Long-Haul Truck	0	0	0
	TOTAL		0	0

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_2e)	35,497.489
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	opModeFra
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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Johnson Management Group Vehicle Audit Report
Birmingham City Schools Vehicle Audits
Fall 2022 through September 2023

JMG conducted 52 audits between Fall 2022 and September 2023.

The following schools were included: Wylam; West End; Hemphill; Minor Community; Center Point; Lipscomb; Hemphill; Center Point; Erwin; Phillips; Glen Iris; I 3 Academy; Washington K-8; Jackson Olin; Erwin Middle; Jones Valley; Phillips Academy; Leeds High School; Huffman Middle; Hard School; Princeton; Center Point; Green Acres; Sun Valley; Glen Oaks; CJ Donald; Robinson; Smith Middle; Minor Elementary; Martha Gaskins; McAdory High; Arrington; Woodlawn High; Pinson Valley; Clay-Chalkville; Minor High; Hueytown; West End; Phillips; Huffman Academy; Ossie Ware Mitchell; Wenonah; Jackson Olin; Princeton; Ephesus; Phillips; Oxmoor Valley; Wilkerson; Huffman Middle; Smith Middle; Central Park and Jackson Olin.

The audits yielded 4,289 pieces of APCA literature being handed out and 1,271 cars shutting off because of the message to turn the key and be idle free. The following graphs summarize the vehicle audits for Birmingham City Schools from October 2022 through December 2022; JMG conducted 13 audits. Total outreach was 918, with 301 parents in compliance at 13 schools. (See Figures 1, 2, and 3).

The following graphs summarize the vehicle audits for Birmingham City Schools from January 2023 through September 2023; JMG conducted 39 audits. Total outreach was 3,371, with 970 parents in compliance at 37 schools. (See Figure 3 through Figure 10).

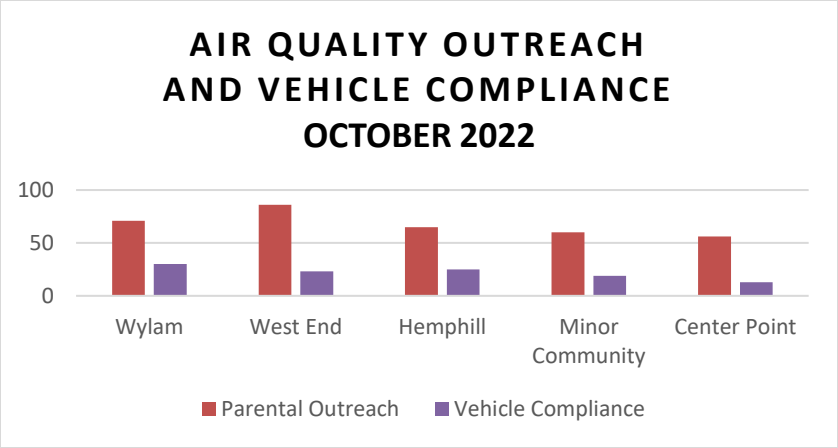

FIGURE 1

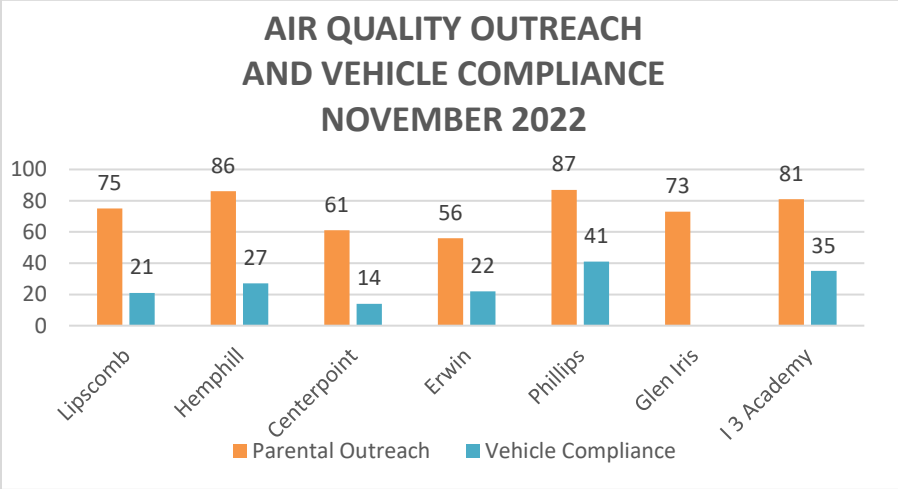

FIGURE 2

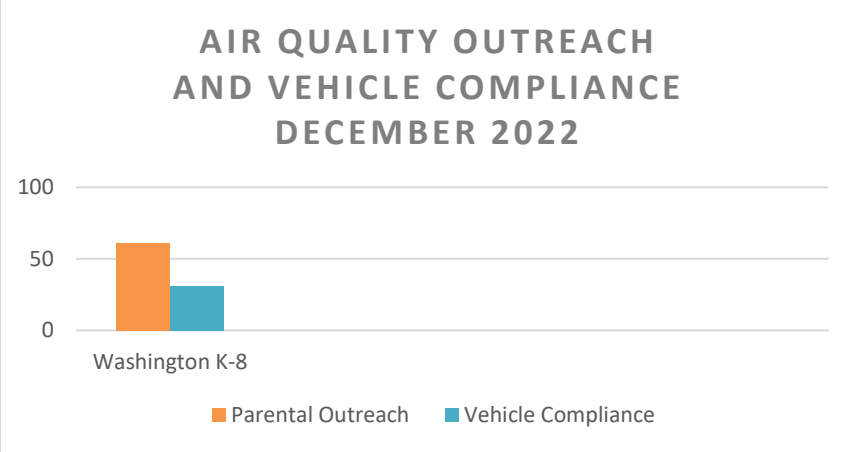

FIGURE 3

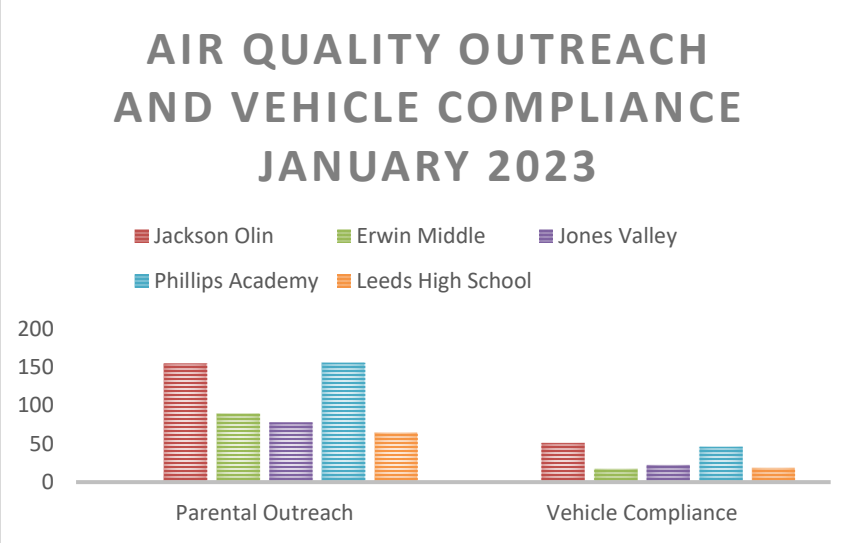

FIGURE 4

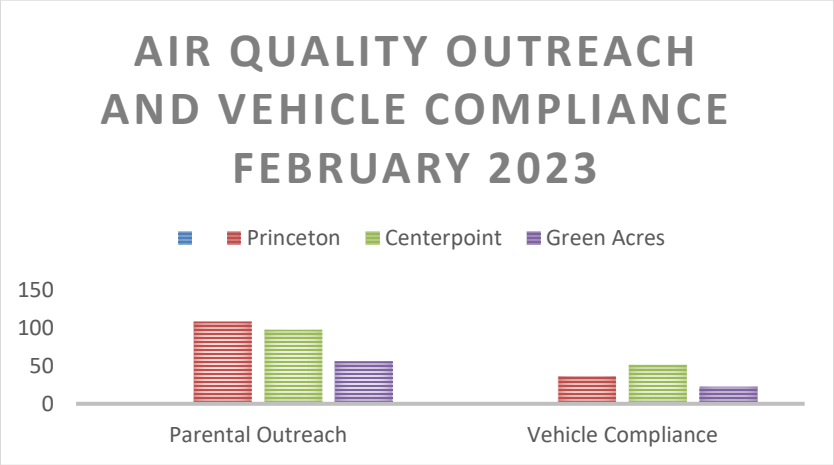

FIGURE 5

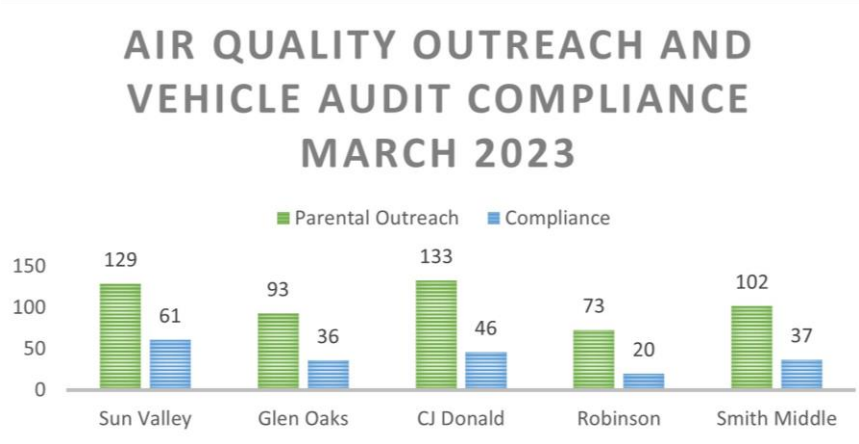

FIGURE 6

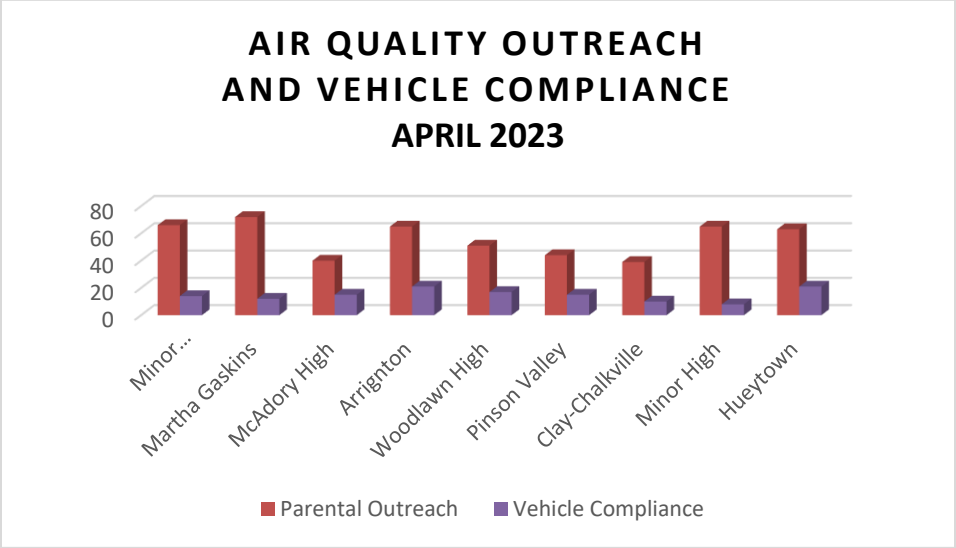

FIGURE 7

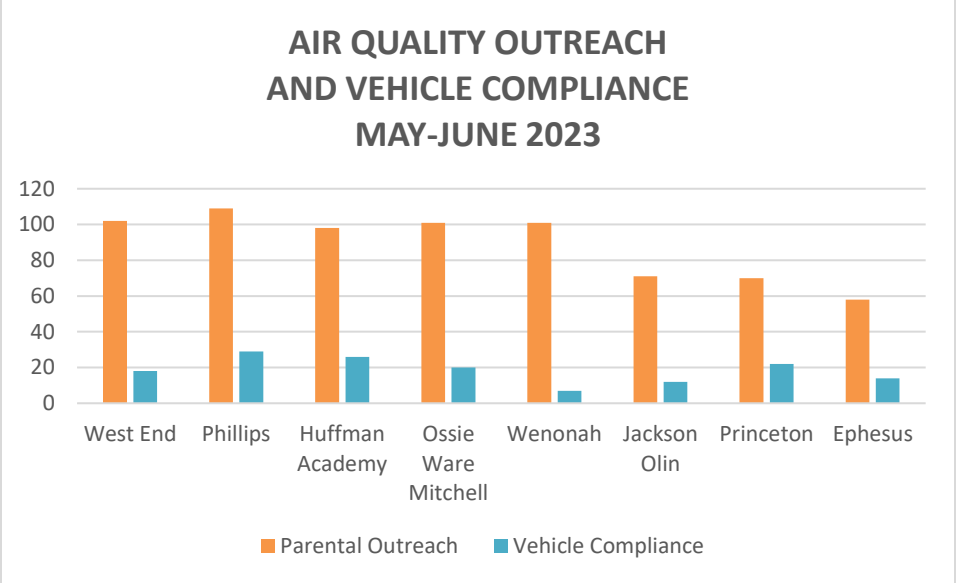

FIGURE 8

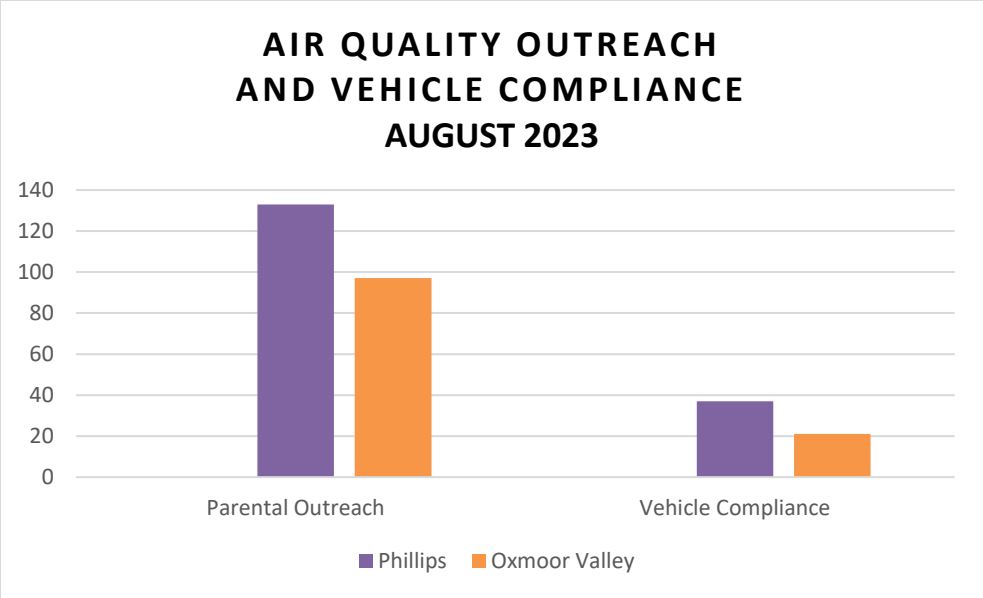

FIGURE 9

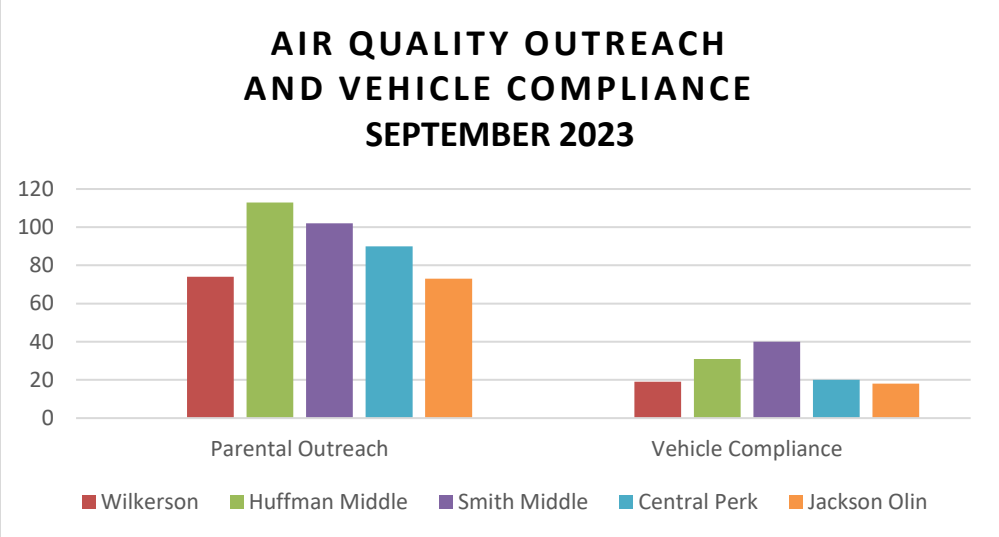

FIGURE 10

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