

**ALABAMA  
PARTNERS  
FOR  
CLEAN AIR**

[www.alabamacleanair.org](http://www.alabamacleanair.org)

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

**Annual Activity Report  
October 1, 2017 – September 30, 2018**

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# **APCA Annual Report**

## **October 1, 2017 – September 30, 2018**

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 policy of the USDOT.

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## EXECUTIVE SUMMARY

This report is comprised of activities of the Alabama Partners for Clean Air (APCA) program from October 1, 2017 – September 30, 2018. The 8-hour ozone standard (0.070 ppm) 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<sub>2.5</sub> standard (35 ug/m<sup>3</sup>). Effective April 15, 2015, the EPA designated the Birmingham area as attainment of the 2013 annual PM<sub>2.5</sub> standard (12 ug/m<sup>3</sup>).

A combination of national and state regulatory programs to control emissions and voluntary actions taken by individual citizens and organizations will be required maintain healthy air quality for the region. While EPA, the Alabama Department of Environmental Management (ADEM) and the Jefferson County Health Department (JCHD) have the responsibility to establish 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 is the reduction of 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 EMPACT 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,
- Voluntary emissions testing and car care program.

The media outreach included television buys. Media efforts continued to bring awareness to air quality alert days as well as actions the public could take on air quality alert days.

Expenditures during this 12-month period were **\$644,638**. Documented emissions reductions attributable to the APCA program was 19.9 pounds per day of hydrocarbons, 78 pounds per day of nitrogen oxides, and 9.7 pounds per day of PM<sub>2.5</sub>.

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## SECTION 1

### AIR QUALITY INFORMATION

#### MONITORING DATA

Air Quality Reports were sent out to members of APCA monthly. 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 2017. This is because air monitoring data is on a calendar year basis (i.e., January 1, 2017 – December 31, 2017) and this report is based on a fiscal year basis (i.e., October 1, 2017 – September 30, 2018).

#### 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 that is an average of the 4<sup>th</sup> highest daily 8-hour ozone value at each site over a 3-year period. The most recent 3-year monitoring period was 2015-2017. The ozone monitoring network consists of 7 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 2015-2017, no monitors violated the standard.

**TABLE 1**

<b>8-Hour Ozone Design Values (2015-2017)</b>	
<b>Monitor</b>	<b>Design Value (ppb)</b>
Corner	64
Fairfield	66
Helena	66
Hoover	66
Leeds	63
McAdory	65
North Birmingham	66
Tarrant	68

#### FINE PARTICULATE MATTER (PM<sub>2.5</sub>)

Effective March 18, 2013, the EPA lowered the annual PM<sub>2.5</sub> standard to 12 µg/m<sup>3</sup>. A 3-year average of annual means is compared to the annual standard to determine compliance. The 24-hour PM<sub>2.5</sub> standard is a 3-year average concentration, based on the 98<sup>th</sup> percentile for each year,

and is set at 35  $\mu\text{g}/\text{m}^3$ . The most recent 3-year monitoring period was 2015-2017. The fine particulate matter (PM<sub>2.5</sub>) monitoring network consists of 5 monitors throughout Jefferson County. The tables below display the annual and 24-hour design values for PM<sub>2.5</sub> at each monitor throughout Jefferson County. There were no violations of the annual and 24-hour PM<sub>2.5</sub> standards for 2015-2017.

**TABLE 2**  
**Annual PM<sub>2.5</sub> Design Values (2015-2017)**

Monitor	Design Value ( $\mu\text{g}/\text{m}^3$ )
Arkadelphia	11.0
Leeds	9.4
McAdory	9.0
North Birmingham	10.4
Wylam	9.5

**TABLE 3**  
**24-Hour PM<sub>2.5</sub> Design Values (2015-2017)**

Monitor	Design Value ( $\mu\text{g}/\text{m}^3$ )
Arkadelphia	22
Leeds	17
McAdory	18
North Birmingham	22
Wylam	18

**AIR QUALITY EXCEEDANCES**

Below are tables showing the exceedances of the 8-hour ozone standard from 2007 thru 2017 and exceedances of the 24-hour PM<sub>2.5</sub> standard from 2007 thru 2017. Note that the EPA lowered the 8-hour ozone standard in 2015 so there was a lower threshold to violate the standard.

**TABLE 4**  
**Exceedances of the 8-Hour Ozone Standard for 2007-2017**

Station	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Corner	3	5	0	1	4	1	1	0	0	1	0
Fairfield	3	3	1	2	2	5	0	0	2	2	0
Helena	3	7	1	2	4	4	0	1	2	4	0
Hoover	3	5	2	4	7	3	0	0	2	2	0
Leeds	2	3	1	2	5	4	0	0	0	1	0
McAdory	3	3	1	3	7	4	0	0	0	2	0

N. Birmingham	2	5	0	1	5	6	0	0	4	3	1
Pinson	2	6	0	3	2	3					
Providence	3	1	0	3	4	2					
Tarrant	2	5	1	8	9	6	1	0	4	3	1
<b>Total</b>	<b>26</b>	<b>43</b>	<b>7</b>	<b>29</b>	<b>49</b>	<b>38</b>	<b>2</b>	<b>1</b>	<b>14</b>	<b>18</b>	<b>2</b>

**TABLE 5**  
**Exceedances of the 24-Hour Fine Particulate Matter (PM<sub>2.5</sub>) Standard for 2007-2017**

<b>Station</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
Arkadelphia								0	0	0	0
Leeds	12	0	0	0	0	0	0	0	0	0	0
McAdory	2	0	0	0	0	0	0				
N. Birmingham	24	7	0	0	1	0	0	0	0	0	0
Wylam	9	5	0	0	2	0	0	0	0	0	0
<b>Total</b>	<b>47</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

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## SECTION 2

### **SUMMARY OF AIR QUALITY FORECASTS AND MONITORED DATA**

The chart below shows a summary of “Air Quality Alerts” that were issued for fine particulate matter (PM<sub>2.5</sub>) and ozone (O<sub>3</sub>) during the period October 2017 – September 2018. “Air Quality Alerts” are forecasted one to two days before the date of the alert. JCDH provides PM<sub>2.5</sub> forecasts year-round and the Alabama Department of Environmental Management provides O<sub>3</sub> 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.

**TABLE 6**  
**Summary of Alert Days**

<b>Date of Alert</b>	<b>Forecast AQI Color</b>	<b>Actual AQI Color</b>	<b>Pollutant</b>
5/9/2018	Orange	Yellow	O <sub>3</sub>
6/6/2018	Orange	Yellow	O <sub>3</sub>
6/8/2018	Orange	Red	O <sub>3</sub>
7/26/2018	Orange	Yellow	O <sub>3</sub>

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 that 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 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 the forecast is above a certain level on the Air Quality Index (AQI), which follows.

**FIGURE 1  
AQI Guide**

<b>AQI Values</b>	<b>Levels of Health Concern</b>	<b>Colors</b>
<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 FY2018 (October 2017 – September 2018), 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-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. The Baron Advance Meteorological Systems (BAMS) provides air quality forecast model information to JCDH and ADEM. Outreach materials for children were also a part of the FY2018 budget. The details of the JCDH’s budget are noted below.

**TABLE 7  
JCDH FY2018 Budget**

	<b>OCT 2017 – SEPT 2018</b>
<b>EMPACT Internet Website UAH</b>	\$18,200
<b>BAMS Subscription Meteorological Service</b>	\$48,000
<b>Outreach Giveaways</b>	\$5,800
<b>Total</b>	\$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 for 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, which includes: Alabama Clean Fuels Coalition, the WRATT Foundation, Advanced Consulting, LLC., United Way of Central Alabama, and The Johnson Management Group, provide the 20 percent match for their respective programs.

**TABLE 8**  
**Air Quality Program Budget Summary for October 2017 – September 2018**

Program Area	Total Budget	Amount Invoiced (includes match \$)
Promotional Items / Print Material-RPC*	\$30,000	\$16,024.14
Media Buy-RPC**	\$41,250	\$41,410.00
Employer/Employee Outreach- Advanced Consulting	\$50,000	\$50,086.97
Idle Free Zones / School Education - Johnson Group	\$68,750	\$68,376.61
Idle Free Zones / School Education – UWCA	\$50,000	\$49,669.72
Clean Cities/Alternative Fuels – ACFC	\$200,000	\$46,265.00
EMPACT/Forecasts – JCDH	\$72,000	\$71,954.50
Diesel Retrofits – ACFC	\$60,000	\$0
Emissions Testing – WRATT	\$110,580	\$128,253.60
Vehicle Repair – WRATT	\$80,000	\$47,929.43
Program Administration – RPC**	\$113,750	\$124,668.28
Contingency – RPC	\$10,000	\$0
<b>Total</b>	<b>\$886,330</b>	<b>\$644,638</b>

\*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**

Alabama Partners for Clean Air continued the “Breathe Easy Alabama” campaign for the 2018 marketing outreach plan. The media outreach included onsite distribution of pledge cards at local events. A strategic digital campaign that included ads through Starnes Publishing in email blasts from The Hoover Sun, 280 Living, The Homewood Star, Village Living and Vestavia Voice ran throughout Air Quality season. In addition, online and print ads ran in The Birmingham Times throughout Jefferson and Shelby counties specifically targeting the African American community. Due to a decrease in budget only one television station was included in the outreach campaign. APCA partnered with WBRC-TV to get the message out to the masses through a strong targeted television campaign. Chief Meteorologist, J.P. Dice, featured an Air Quality Forecast in the late news during the campaign. Charter Spectrum provided targeted messages through an “all local” campaign that targeted cord-cutters and millennials. A unique advertising tool was utilized called “Spokesman”. A local entrepreneur created a rolling billboard that he transports on a bicycle. These ads were used during local events in the downtown area including Birmingham Barons baseball games and Pepper Place. Local interviews on radio and television were conducted throughout Air Quality Awareness Week to educate the public about ways they can make a difference in the reduction of vehicle emissions. Birmingham Times also ran an article that ran in the publication during Air Quality Awareness Week.

The television messages highlighted people enjoying activities outside in the fresh air. One message focused on recreation with a couple in a canoe on the lake and a family enjoying a picnic at the park. A white fan was featured throughout both messages to provide consistency and a way for viewers to remember the theme and call to action, “Breathe Easy Alabama”. The second message was designed to draw attention to carpooling and focus on the important impact sharing a ride can make on the air quality. This message featured four co-workers meeting in a parking lot and sharing a ride to work.

#### **PLEDGE CARDS:**

Pledge cards were distributed at outreach events throughout Jefferson and Shelby Counties to get people actively involved in the thinking about making positive changes that will make a difference in the quality of the air.

#### **DIGITAL CAMPAIGN:**

The website [alabamacleanair.org](http://alabamacleanair.org) provided information and helpful tips for consumers to help find ways to keep the air clean. Throughout the campaign the website was promoted through television messages, media interviews and on the pledge cards. A digital campaign ran on the provided a click through to the APCA website. An email blast digital campaign ran through Starnes Media in targeted neighborhoods in Jefferson and Shelby Counties. Digital ads also ran on Bahm Now, an online local publication and BT Birmingham Times, a print and digital publication that targets the African American community.

**FIGURE 2**  
**Alabama Partners for Clean Air website**



**Media Release Outreach and Media Interviews:**

On Air Quality Alert Days media releases were sent to local television and radio stations in addition to Al.com. Media releases are sent the day before an Air Quality Alert is being issued. Information on these alerts is provided by the Jefferson County Department of Public Health which monitors air quality daily.

**Air Quality Awareness Week**

A series of interviews were done to promote Air Quality Awareness Week. In addition to radio and television interviews, Birmingham Times published an article written by Matt Lacke.

**TABLE 9**  
**Air Quality Awareness Week Interviews**

<b>Date</b>	<b>Time</b>	<b>Station</b>	<b>Program</b>	<b>Total A18+</b>
<b>3/30/2018</b>	9:00am-10:00am	WBMA-TV	Talk of Alabama	18,000
<b>4/3/2018</b>	12:00pm-12:30pm	WIAT-TV	Midday News	23,000
<b>4/1/2018</b>	12:00pm-1:00pm	WBRC-TV	Midday News	39,000
<b>4/2/2018</b>	8:00am-8:30am	Birmingham Mountain Radio	Morning Blend	1,600
<b>4/4/2018</b>	6am-7am	WBRC-TV	Good Day Alabama	69,300
			<b>Total Adult impressions</b>	<b>150,900</b>

## Spokesman

APCA was featured throughout downtown Birmingham during Air Quality Awareness Week with ads on the back of a bicycle. These ads were utilized during high traffic events including Birmingham Barons games, Pepper Place Market and Do Dah Days.

**FIGURE 3**  
**Spokesman Cycle Ads**



## TELEVISION CAMPAIGN

Due to decreased media budget only one television station was selected to partner with APCA for the 2018 campaign. WBRC-TV was chosen because of their strong reach and presence in the market.

### **WBRC-TV provided the following:**

165 paid commercials aired in Good Day, Evening News, Late News, Late Fringe and weekend  
634.2 GRP's W25-54 (36.27 CPP) and 634.2 GRP's A25-54

130 commercials aired on Bounce at no charge (Value of \$3,250)

Air Quality Update in late news throughout the campaign (Value \$5,250)

Table at Women's Expo (Value \$750)

Business Break Interview (Value \$1,000)

Total added value = \$10,250.00

### **Charter Spectrum- OTT or Ads Everywhere**

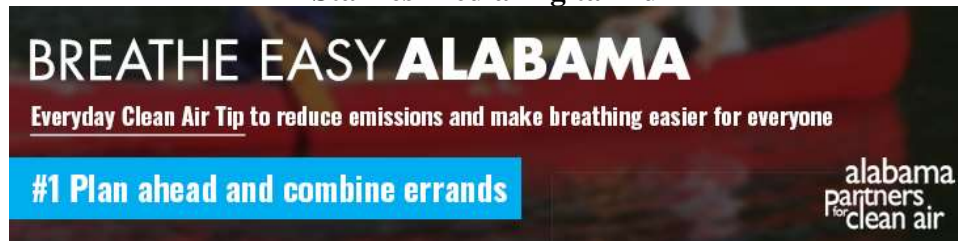
Many viewers are no longer watching traditional broadcast or cable television but instead are watching on demand and on other devices including smart phones and other smart screens through services such as Hulu, Amazon and more. OTT ads targeted specifically Jefferson and Shelby counties with an emphasis on individuals who are environmental conscious. Charter Spectrum delivered 60,550 targeted impressions throughout the campaign at a non-profit rate. Added value included crawl on weather channel throughout the campaign.

Total added value = \$2,500.00

## Starnes Media

Digital ads were featured throughout the campaign featuring Air Quality Awareness Tips. These ads were in the digital formats delivered to Hoover, Homewood, Vestavia, 280 Area and Mountain Brook. APCA was given the non-profit rate which is 50% of rate card for a value of \$1,000.00

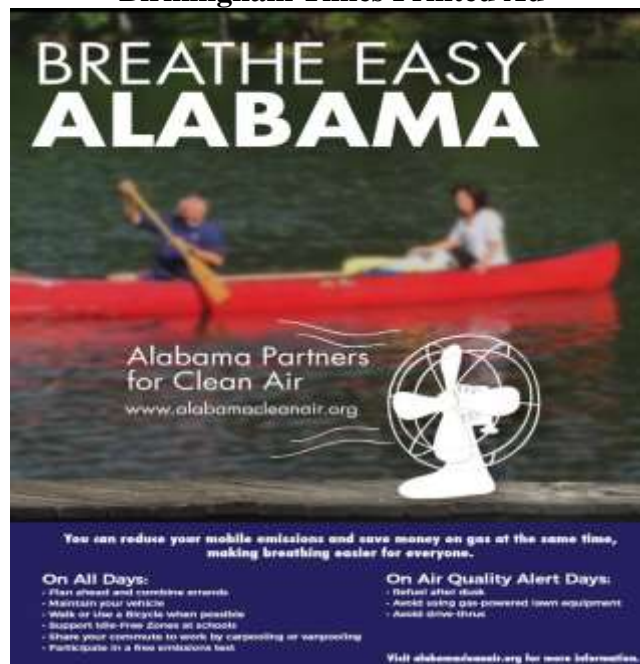
**FIGURE 4**  
**Starnes Media Digital Ad**



## Birmingham Times

Ads ran in Birmingham Times print and online publications throughout the campaign. An additional 4 ads ran in the publication at no charge for a value of \$800.00.

**FIGURE 5**  
**Birmingham Times Printed Ad**



**TABLE 10**  
**Campaign Overview**

<b>STATION</b>	<b>Paid ads</b>	<b>Delivered ads</b>	<b>Added Value</b>
WBRC	165	295	\$10,250.00
Charter Spectrum	50,000 impressions	60,500 impressions	\$2,500.00
<b>TOTAL TV</b>	<b>165</b>	<b>295</b>	<b>\$12,750.00</b>
<b>Digital/Print</b>			
Spokesman	17 hours	20 hours	\$150.00
The Birmingham Times	6 ¼ page ads	10 ¼ page ads	\$1,000.00
Starnes Publishing	100 digital ads	100 digital ads	\$1,000.00
<b>Total Digital/Print</b>			<b>\$2,150.00</b>
		<b>Total Net Cost</b>	<b>Total Added Value</b>
		<b>25,600.00</b>	<b>\$14,900.00</b>

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## SECTION 5

### **EMPLOYER/EMPLOYEE OUTREACH**

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

From October 2017 to September 2018, Advanced Consulting continued to work on keeping and building relationships with current corporations, but they also worked on getting the message out to the community through community events and programs.

Advanced Consulting spoke to and attended 30 company and civic events and 87 community events. Advanced Consulting also had a total of 7,565 pledge cards signed through the 117 company, civic group, and community events attended.

#### **2017-2018- Children's of Alabama New Employee Orientation Meetings**

##### **Children NEO Events: 23**

##### **Pledge Cards: 903**

Oct 2, 2017	30 attendees	30 pledge cards
Oct 16, 2017	42 attendees	42 pledge cards
Oct 30, 2017	18 attendees	18 pledge cards
Nov 13, 2017	31 attendees	31 pledge cards
Nov 27, 2017	18 attendees	18 pledge cards
Dec 11, 2017	25 attendees	25 pledge cards
Jan 8, 2018	25 attendees	25 pledge cards
Jan 22, 2018	33 attendees	33 pledge cards
Feb 5, 2018	47 attendees	47 pledge cards
Feb 19, 2018	41 attendees	41 pledge cards
Mar 5, 2018	18 attendees	18 pledge cards
Mar 19, 2018	23 attendees	23 pledge cards

April 2, 2018	27 attendees	27 pledge cards
April 16, 2018	25 attendees	25 pledge cards
April 30, 2018	32 attendees	32 pledge card
May 14, 2018	55 attendees	55 pledge cards
June 11, 2018	77 attendees	77 pledge cards
June 25, 2018	57 attendees	57 pledge cards
July 9, 2018	75 attendees	75 pledge cards
July 23, 2018	38 attendees	38 pledge cards
Aug 6, 2018	38 attendees	38 pledge cards
Aug 20, 2018	39 attendees	39 pledge cards
Sept 17, 2018	80 attendees	80 pledge cards

**Other Company Events:**

**Other Company Events: 7**

**Total Pledge Cards from Other Company Events: 678**

Oct 17, 2017	Bio-Horizons	150 attendees	54 pledge cards
Feb 7, 2018	UAB Health Fair	200 attendees	71 pledge cards
April 24, 2018	Mercedes	150 attendees	73 pledge cards
April 25, 2018	Mercedes	75 attendees	57 pledge cards
May 3, 2018	JCDH	200 attendees	58 pledge cards
May 24, 2018	Bio-Horizons	150 attendees	53 pledge cards
June 6, 2018	Children's Health Fair	375 attendees	312 pledge cards

**Total Pledge Cards from Children's NEO and Other Company Events: 1,581**



## Community Events

<b>2017</b>	<b>Event</b>	<b>Attendees</b>	<b>Pledge Cards</b>
Oct 5	Southern Women's Show	1000	48
Oct 7	Butterbean Festival/ Pinson	4,000	121
Oct 7	Ensley Party w/a Purpose	500	106
Oct 7	Homewood Fire and Safety Day	100	28
Oct 1	Shelby Iron Works	100	55
Oct 14	Heritage Festival/ JCA/Irondale	200	67
Oct 14	Comm Health Fair/ Montevallo	100	25
Oct 20	Shelby Senior Summit	300	76
Oct 21	Oak Ridge Fun Day	100	39
Oct 21	Pratt City Red Ribbon Day	200	48
Oct 28	Warrior Day	600	66
Oct 29	Howling at The Moon/Fultondale	300	81
Nov 11	Harpersville Day	400	106
Nov 12	Barktober Fest/ Helena	600	67
Nov 16	Paul Mitchell Cosmetology Hoover	50	22
Dec 5	Fam Involve. Program/Bham City	80	72
January 2018	No Community Events		
February 2018	No Community Events		
Mar 15	ADRS Teen Career Fair	200	116
Mar 20	UAB Volunteer Fair	200	41
Mar 22	Birmingham City Parent Camp	100	67

<b>Community Events Continued- 2018</b>		<b>Attendees</b>	<b>Pledge Cards</b>
April 7	Woodlawn Street Festival	400	73
April 11	BCBS Nat Walk at Lunch/Lynn P.	2000	360
April 13	Shelby Co. DHR Resource Fair	100	42
April 21	Montevallo Art Festival	300	74
April 21	Earth Day Botanical Gardens	300	135
April 21	Party for the Planet/ Bham Zoo	300	52
April 21	107 Days to Better Health Expo	100	41
April 25	BCBS Nat Walk at Lunch/HQ	300	142
April 26	Shelby County Senior Picnic	500	123
April 26	Barron's Game	1000	85
April 28	Celebrate Hoover Day	3000	241
April 28	Calera Strawberry Festival	200	68
April 28	Pepper Place	500	120
May 5	We Love Homewood Day	800	100
May 5	Alabama Folk Fair/ Bessemer	150	92
May 6	Market on a Shoe String	200	64
May 11	Arc Stories	250	15
May 12	Eastlake Farmer's Market	100	62
May 12	BCBS Take the Challenge/ RR Park	100	52
May 15	Trussville Tuesday Market	150	38
May 18	Pinson Farmer's Market	100	34
May 19	Killough Springs Health Fair	100	55

<b>Community Events Continued- 2018</b>		<b>Attendees</b>	<b>Pledge Cards</b>
May 19	Community Yard Sale/Agape Church	100	63
May 19	Leeds Creek Bank	300	76
May 22	Rocky Ridge Farmer's Market	100	31
June 2	Alabaster Festival	1000	120
June 2	West Homewood City Fest	200	60
June 3	Vulcan's Birthday Bash	300	111
June 4	Montevallo Farmer's Market	150	45
June 6	Ensley Health Fair	100	19
June 7	Leeds Farmer's Market	50	20
June 7	Bessemer Farmer's Market	50	25
June 9	Eastlake Fishing Rodeo	200	72
June 9	Summer Market (McCalla)	100	43
June 9	Unity in the Community Midfield	100	44
June 16	The Market Place/ Good People	200	48
June 19	West Homewood Farmer's Market	200	40
June 21	CenterPoint Farmer's Market	150	17
June 23	Eastlake Farmer's Market	100	15
June 23	Cahabazaar	500	80
June 23	Single Mom (McWane Center)	100	57
June 30	Columbiana Liberty Day	500	77
July 2	I Love America Night/Vestavia	300	57
July 7	OTBP Market Days/ McCalla	100	32

<b>Community Events Continued- 2018</b>		<b>Attendees</b>	<b>Pledge Cards</b>
July 7	Oakridge Church/ Com. Yard Sale	100	39
July 14	Lee Branch Farmer's Market	100	63
July 19	Gardendale Farmer's Market	100	52
July 21	Helena Market Days	50	46
July 21	Valleydale Farmer's Market	75	36
July 28	Vincent In the Park	300	129
July 30	Montevallo Farmer's Market	100	41
Aug 4	Eastlake Farmer's Market	100	42
Aug 7	West Homewood Farmer's Market	200	48
Aug 8	Eastwood Pharmacy Health Fair	100	45
Aug 10	Dannon Project Back to School Bash	100	44
Aug 11	Woodlawn Street Market	500	102
Aug 17	Fox 6 Woman's Health Fair	500	175
Aug 18	Community Day/ Pratt City	100	38
Aug 18	NAACP Non-Violence Block Party	150	63
Aug 25	Lee Branch Farmer's Market	150	41
Aug 25	Fultondale Founder's Day	500	69
Sept 8	Pepper's Place Farmer's Mark.	500	71
Sept 8	Community Eco Fair	100	22
Sept 8	Norwood Craft Fair	100	36
Sept 8	National Drive Electric/UAB	50	10
Sept 14	Wellness Senior H& W Fair	300	160

<b>Community Events Continued- 2018</b>		<b>Attendees</b>	<b>Pledge Cards</b>
Sept 15	Sun Valley N A Health Expo	75	40
Sept 29	Whistle Stop Leeds	500	101
<b>Total Pledge Cards for Community Events:</b>		<b>5,984</b>	

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## SECTION 6

### **SCIENCE AND ENVIRONMENTAL EDUCATION OUTREACH**

The Johnson Management Group (JMG) in conjunction with the United Way of Central Alabama's (UWCA) Healthy Communities works with Alabama Partners for Clean Air on science and environmental education outreach in Jefferson and Shelby County school districts.

The Johnson Management Group's focus is to reach out to school boards, principals and administrators to gain entry into the systems to bring awareness of the idling campaign.

During the 2017/18 school year, JMG conducted, facilitated and attended school meetings, presented message during bike rodeos and classroom sessions at 38 schools. JMG reached 4,100 students during presentations and 2,354 parents/citizens during 23 car audits, while passing out over 6,000 pieces of literature. JMG has successfully managed to be in 117 schools across 7 school districts.

JMG awarded students with APCA and Idle Eddy back packs, pens, pencils, windshield stickers, wristbands, fans and brochures. JMG shared the message on air quality and how their messaging has increased awareness and is resulting in better air quality because of the campaign. JMG will continue to focus on sharing with student's environmental education and making parents/citizens aware by asking them to turn the key to be Idle Free.

**FIGURE 6**  
**JMG Outreach School Events**





United Way of Central Alabama’s Healthy Communities supports active modes of transportation and safe routes for non-drivers. The UWCA Healthy Communities initiative has undertaken this work because it has numerous benefits, including: increasing physical activity, improving air quality, increasing safety, traffic mitigation, and increased community engagement.



Healthy Communities' effort includes a school-oriented program to educate and encourage students on healthy lifestyle choices and working directly with cities to find ways to improve the physical environment to be more conducive for walking and biking. Included in our education and encouragement activities are walk and bicycle events both at the school and in the community. In support of these events, we distribute flyers, which note routes which have supportive active transportation infrastructure, and include information about how transportation-based decisions impact air quality.

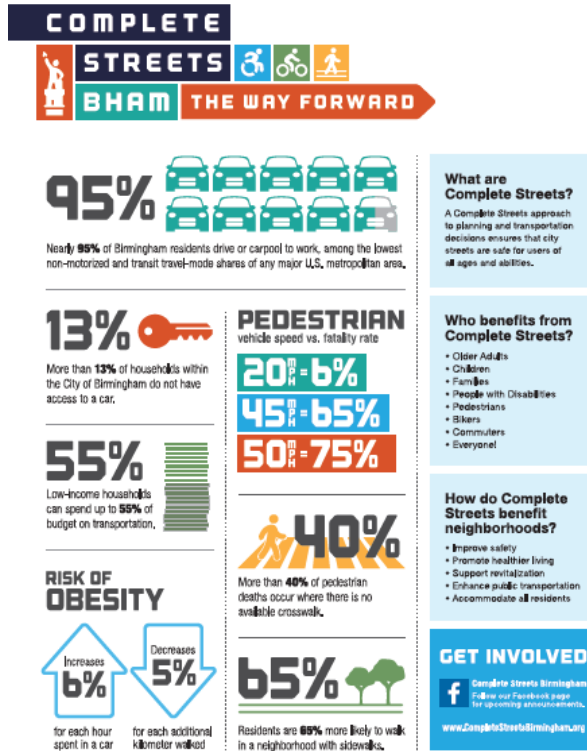
In 2017-18, through various community events, Healthy Communities impacted 8,123 participants. In addition to events and education, our outreach efforts included information via the United Way of Central Alabama website, and a radio PSA. Other accomplishments include the highlights below:

- UWCA celebrated National Walk to School Day with events throughout the month of October, including being featured as part of Red Rock Tuesday with Jeh Jeh Pruitt on Tuesday, Oct. 3 at Midfield Elementary, and received additional media coverage on Wednesday, Oct. 4 at Hemphill Elementary. The Oct. 4 Walk to School Day event was in partnership with Children's AL, and a PSA ran on 105.5 as part of awareness leading up to the event.
- On March 6, 2018, the Birmingham City Council unanimously approved a Complete Streets ordinance that will guide future transportation projects within the city, a major step toward making Birmingham streets safer for all users. Under the policy, the city will establish short- and long-term goals and strategies for building more walking, biking and transit facilities within Birmingham. UWCA and other partners supported this effort to improve safety and air quality and increase physical activity.
- During the month of May we celebrated Bike Month and hosted several events. On May 4, 2018, we partnered with Bluff Park Elementary to celebrate National Bike to School Day with approximately two hundred students and parents participating. Also, numerous bicycle rodeos were hosted throughout the month at schools in conjunction with PE classes and field days, as well as one community event at Memorial Park. In celebration of Bike Month, our program also received nine new bicycles from Blue Cross Blue Shield of Alabama, and those bicycles are now part of the inventory we use to host bicycle rodeo events.
- In August 2018, Washington K8 School officially adopted a school travel plan that was created in partnership with UWCA, UAB, the school, and other community partners. The plan was the culmination of a year-long effort to survey existing conditions, receive community input, and create recommended solutions to increase safety and walkability in the area.

**FIGURE 7**  
**National Walk to School Day**  
**Birmingham celebrates National Walk to School Day**



**FIGURE 8**  
**Complete Streets**



**FIGURE 9**  
**Washington K-8 Travel Plan**



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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 APCA Voluntary Air Quality 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. Managing a regional diesel retrofit program in Jefferson and Shelby Counties.
3. Creating “Clean Corridors” that traverse the Birmingham Region.
4. Participating in the U.S. Department of Energy Clean Cities Program as a designated coalition for the region.
5. Providing the RPC/MPO technical assistance and review of APCA program monitoring and evaluation, compiling data on allocation of CMAQ funds and expected air quality benefits.
6. Assisting the APCA partnership in the implementation of program goals and objectives, promotions, and activities in various community sectors in Jefferson and Shelby Counties.

During FY2018, alternative fuel usage in Jefferson and Shelby Counties totaled 2,360,173 gallons or GGE’s (gasoline gallon equivalent). This included approximately 240,000 gallons of E85 Ethanol, 4,400 gallons of B20 Biodiesel, 2,300 gallons of B100 Biodiesel, 23,300 GGE’s of Propane, 1,949,000 GGE’s of CNG, 90,000 GGE of LNG, 47,600 GGE’s of electricity representing approximately 1,096,000 electric miles driven, and 4500 GGE’s of electricity from the use of Alabama based Zero RPM idle reduction technologies. 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 approximately 18.8% from FY 2017. Local fleets using alternative fuels during this reporting period included: the City of Birmingham (E85 & Propane), the City of Alabaster (B20 & B100 Biodiesel), the Alabama Department of Transportation Third Division (E85 Ethanol), the Birmingham-Jefferson County Transit Authority (CNG), the City of Trussville and Trussville Utilities (CNG), Alabama Power Company (Electricity & Idle Reduction Technologies), Veal Convention Services (Propane), Evergreen Transportation (CNG), Regions Bank (Propane & Electricity), Adkins On-Time Service (Propane), Melton Automotive (CNG), JNB Logistics (Propane), University of Alabama at Birmingham (Electricity), Lawson State Community College (CNG), Birmingham City Schools (Propane), and Spire Alabama - formerly Alabama Gas Corporation (CNG).

During the reporting period ACFC remained active in promoting the use of retail stations in Jefferson and Shelby counties that offer alternative fuels for sale to the public. In Jefferson County the Dogwood Shell in Vestavia offers E85 Ethanol. In Shelby County two stations

continued selling E85 Ethanol, the Highway 280 Shell near Valleydale Road and Jet Pep on Highway 31 in Pelham. CNG also continued to be available at the Birmingham-Jefferson County Transit Authority's public access CNG refueling station in Birmingham, the McCullough Oil Chevron in Trussville and at Evergreen Transportation in Calera. LNG continued to be available at the Clean Energy Fuels station on Daniel Payne Drive. EV charging is available at the Tesla Supercharger located at Uptown.

A previously completed ACFC Diesel Retrofit project in Jefferson County reduced approximately 23.175 tons of criteria pollutants during this reporting period (including 4.29 tons of VOC's and 1.65 tons of PM). This project involved the installation of diesel emissions control devices on eleven pieces of medium and heavy-duty off-road equipment operated by three fleets: The City of Homewood, Fritz Enterprises, and Porter Construction. ACFC continued efforts throughout the reporting period to increase alternative fuels use, to expand alternative fuel infrastructure, and to develop diesel retrofit projects in the region.

In March 2018, FHWA approved the ALDOT submitted nominations for Alternative Fuel Corridor designations in Alabama under Section 1413 of the FAST Act. Seven of the following approved "Clean Corridors" traverse the Birmingham Region:

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3. I-59 CNG – Signage Ready from the AL-MS State line to Trussville, AL
4. I-59 CNG – Signage Pending Trussville AL to AL/GA border
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6. I-65 LNG – Signage Pending Birmingham AL to Theodore AL
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ACFC assisted ALDOT with the preparation of the Alabama corridor nomination submission and the RPC staff assisted ACFC with the preparation of infrastructure maps included in the submission.

ACFC is a partner on a project that was awarded \$4.6 million from the US DOE in 2017 for the Southeast Alternative Fuels Deployment Project. The project included a public CNG fueling station in Birmingham, however, after the award was made the partner on this station, Spire Natural Gas Fueling Solutions, withdrew from the project. During 2018 an RFI was issued for redirecting the award and five (5) proposals were received. Two (2) Birmingham stations were selected for award – a public CNG station to be added to the existing Clean Energy LNG station on Daniel Payne Drive on I-65 and a slow-fill station in Tarrant for the Waste Management refuse truck fleet operating in the region.

During the spring, ACFC promoted and encouraged the participation of fleets from Jefferson and Shelby counties and across the State in five Public Information and Listening Sessions conducted by the Alabama Department of Economic and Community Affairs (ADECA) to provide current information related to the Volkswagen Settlement in Alabama and to gather input for the

development of an Environmental Mitigation Plan (Alabama VW Plan) for the state. ACFC attended three of the five sessions which were held in Birmingham, Montgomery, Decatur, Bay Minette, and Dothan. The Alabama VW Plan, when finalized by ADECA, will provide more than \$25 million of funding assistance for the reduction of diesel emissions in the State.

ACFC actively assisted the APCA partnership in promoting the program goals and objectives by conducting outreach efforts to community sectors and organizations in Jefferson and Shelby Counties. These outreach efforts included presentations on alternative fuels and advanced technology vehicles at the American Institute of Architecture Birmingham Chapter Electric Bus Demonstration Meeting and the Vestavia Hills Rotary Club; organizing, planning, and conducting a Propane Workshop at Lawson State Community College, a National Drive Electric Week Event at Brookwood Village, and manning an alternative fuel informational booth at the Alabama League of Municipalities Annual Meeting in Montgomery. In addition, ACFC conducted other similar outreach efforts across the state which included participants from the Birmingham region at the Alabama Chapter National Association of Fleet Administrators Southeast Region Annual Meeting, the US EPA Southeast Diesel Collaborative Annual Partners Meeting, and the Alabama Student Transportation Conference. These efforts also included: participating in numerous alternative fuels and APCA media events and responding to numerous media and consumer inquiries on alternative fuels and vehicles.

ACFC also attended all APCA Steering Committee meetings during the reporting period and reported on all ACFC projects and activities.

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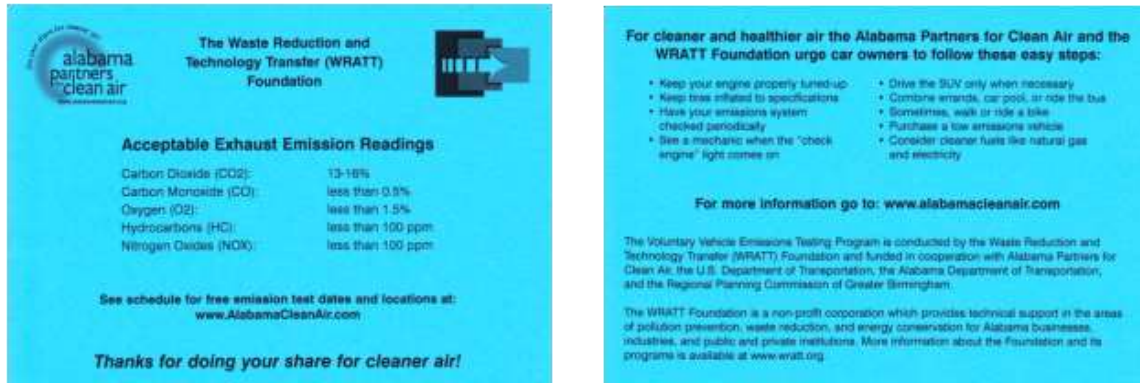
## SECTION 8

### VOLUNTARY EMISSIONS TESTING PROGRAM

The current Car Care Program began in January of 2008 and has continued annually through 2018. The program is comprised of four major functions:

1. The program creates public awareness of ground-level ozone pollution by emphasizing the importance of vehicle maintenance primarily for vehicle emission control systems.
2. Testing of vehicle emissions is performed at various Express Oil Change (EOC) locations to identify those vehicles that are contributing to air quality issues in the area. During testing events, vehicle exhaust is analyzed for the regulated pollutants -- unburned hydrocarbons (HC/ppm), carbon monoxide (CO%) and nitrogen oxides (NOx/ppm) -- as well as carbon dioxide (CO2%) and oxygen (O2%) as measures of combustion efficiency. In addition to receiving information from WRATT representatives during testing, owners are given an information card and a copy of the test results for their vehicle. This helps build awareness of the need to control these emissions. Note that acceptable parameters for each gas are listed on the information card and explained to each vehicle owner after the test.

**FIGURE 10 – Information Card for Vehicle Owners**



**FIGURE 11 – Sample Results Printout for Vehicle Owners**

APCA VEHICLE EXHAUST GAS ANALYSIS  
PERFORMED BY WRATT FOUNDATION

DATE: \_\_\_\_\_

VEHICLE: \_\_\_\_\_

5 GAS RESULTS

CO2 = 15.1  
CO = .01  
O2 = 0.1  
HC = 30  
NOX = 12

CLEAN

3. . WRATT used two two-man teams working two to three days per week from March through September. One team made measurements using an EMS Model 5001 5-Gas Analyzer and the other used an EMS Model 5002 5-Gas analyzer. The Mod 5002 Analyzer enabled measurement of the vehicles' Air/Fuel ratio as well as the other gases. Additionally, 50-foot hoses for probes were used to give team members greater access to vehicles at all station bays. When appropriate diagnostic trouble codes (DTC) were read from the vehicle's OBD-II computer with an INNOVA Model 3100 code reader.
4. At on-site testing, vehicles identified as having emissions problems are referred to the Car Care Program's repair regimen that may subsidize the repair cost of the vehicle within certain parameters. The goal is to decrease release of automotive pollutants by encouraging owners to undertake qualified repairs by making these repairs more affordable.

**Restrictions and Limitations for Qualification  
Under the 2018 Car Care Program (CCP)**

- CCP pays 80% of repair costs up to a limit of \$700. The car owner (not a business or third party) must pay the remaining 20% plus any cost exceeding the \$700 limit;
- The car must have fewer than 150,000 miles on its odometer;
- The car must be 12 years old or less based on date (mo./yr.) manufactured;
- The repair must be directly related to diminished control of vehicle emissions (as indicated by exhaust gas analysis and OBD-II code). For example, replacement of mufflers/repairing exhaust leaks are not qualified repairs under the CCP. Typical repairs have included, but are not necessarily limited to, catalytic converters, O<sub>2</sub> sensors, EVAP systems, EGR systems, MAF and MAP sensors);
- The car must be registered in Jefferson or Shelby Counties or car owner must be able to prove residency in either Jefferson or Shelby Counties (e.g., address on driver license, address on pay stub, rental/lease agreement);
- Car owner has 60 days from the date qualified to make the repair at a participating Express Oil Change facility;
- Only one repair qualification is allowed per vehicle;
- Cars under manufacturer's or extended warranties are not eligible, e.g., 8yr/80,000mi emissions control device (catalytic converter) warranty;
- Fleet or company-owned vehicles are not eligible;
- Vouchers issued for repairs have no intrinsic cash value and are not to be bartered or sold.

**OVERVIEW STATISTICS**

The following statistics apply to the program during the reporting dates October 1, 2017 through September 30, 2018. There were:

- 126 testing events at EOC locations each staffed by 2 WRATT technicians;
- 2560 Vehicles Tested (an average of ca. 20 vehicles per event);
- Over 20,000 data points recorded on-site (all data spreadsheets are presented in the Appendix attached to this report);
- 67 Vehicles Qualified for Repair (about 2.1% of those tested); and

- 44 qualified vehicles were repaired (about 66% of those qualified)

The following table provides a summary of the emissions test statistics:

**TABLE 11-EOC Monthly Emissions Testing Report**

January 2018	0	0	0	0
February 2018	0	0	0	0
March 2018	20	409	18	6
April 2018	18	303	6	6
May 2018	21	474	14	10
June 2018	18	358	9	5
July 2018	15	283	5	5
August 2018	18	400	7	7
September 2018	16	333	8	5
<b>2018 YTD Totals</b>	<b>126</b>	<b>2560</b>	<b>67</b>	<b>44</b>

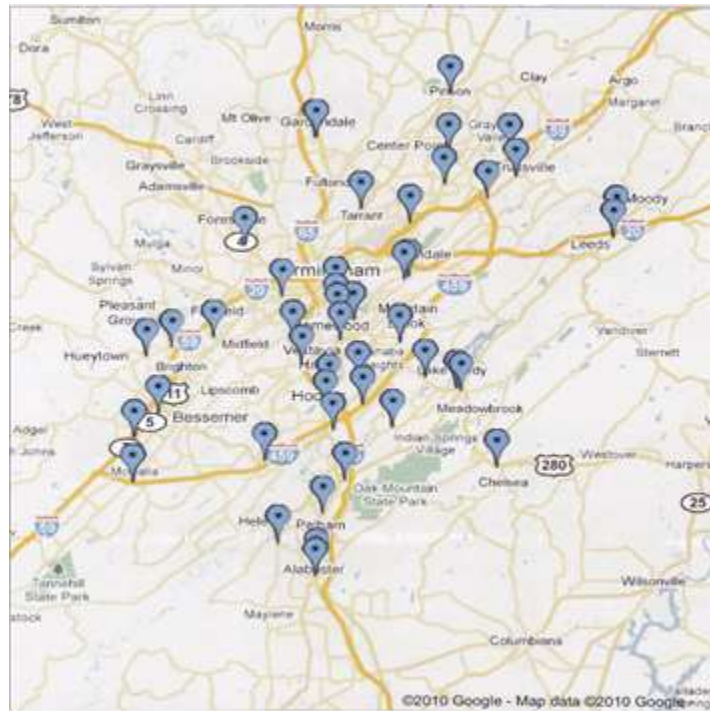
### **REPAIR STATISTICS**

The repairs were performed at various Express Oil Change locations. The average mileage of these vehicles was about 120,000 miles. The total amount of Car Care Program repair expenditures for these vehicles was about \$25,500. Total repair cost was approximately \$42,500. The average cost per repair was about \$580 for Car Care, and \$970 total. A breakdown of these repairs is shown in Table 2. below (several cars had more than one emissions system repaired during their repair visit):

**TABLE 12 -Emission System Type and Number of Repairs**

<b>Repair</b>	<b>Number Performed</b>
O <sub>2</sub> Sensor	7
Catalytic Converter	29
EVAP System	7
Other	3
<b>Total</b>	<b>46</b>

**FIGURE 12 - Map of Test Sites**



The map of test sites in Figure 11 above shows the geographic area served by the Car Care Program. The map indicates that the program offered broad and representative coverage of Jefferson and Northern Shelby counties. Other events were held at Alabama Power Company, and Jefferson County Department of Health.

**AVERAGE COST OF MOST COMMON REPAIRS**

Using the vehicles in which only one repair was performed, Table 14 shows the frequency of the three most common emissions repairs and the average cost of these repairs to the Car Care Program (at 80% reimbursement up to \$700) and total cost of the repair:

**TABLE 13 – Most Common Repairs**

<b>Component</b>	<b><u>REPAIR</u></b>	<b><u>AVG CAR CARE COST</u></b>	<b><u>AVG TOTAL COST</u></b>
<b>Oxygen Sensors</b>	<b>15%</b>	<b>\$325</b>	<b>\$545</b>
<b>Catalytic Converters</b>	<b>63%</b>	<b>\$670</b>	<b>\$875</b>
<b>Evaporative Emission</b>	<b>15%</b>	<b>\$460</b>	<b>\$575</b>

## **CONCLUSION**

An important part of the Car Care Program is education of vehicle owners concerning the need for proper maintenance of their vehicles. A second but equally important step is encouraging owners to repair emissions-related problems when a Fix on Fail (FOF) occurs, i.e., when a malfunction indicator lamp (MIL) is first observed. Prompt attention to these issues can often result in savings on future repairs of more costly items such as O<sub>2</sub> sensors and catalytic converters.

It should be emphasized that the WRATT team is making measurements at idle and not performing an I/M240 (dynamometer) measurement. Vehicles would need to be tested under a “load” (i.e. driving down the interstate or on a dynamometer) to make many problems manifest themselves via exhaust gas analysis alone.

It should also be noted that many states have abandoned the I/M240 test in favor of monitoring the vehicle’s DTC-MIL for certification because it allows more comprehensive assessment of all functions and interactions of the emissions control system and is much less costly to the car owner. WRATT also makes DTC (OBD-II reads) for confirmation of under-performing emissions control systems. It is important to note that in all cases where repairs were made, the MIL remained off indicating that the emissions problem was successfully mitigated.

**FIGURE 13 - Typical Emissions Test Events**





## SECTION 9

### DOCUMENTED EMISSIONS REDUCTIONS

Documenting emissions reductions from a voluntary program is dependent upon voluntary reporting or a proxy measurement tool such as a scientific survey. To gauge the emissions impact of the program for 2017 - 2018, RPCGB staff used both methodologies. First, staff calculated emissions reductions based on voluntary reporting of the following activities:

- Decreases in vehicle emission rates due to the different alternative fuel programs.
- Decrease in vehicle miles traveled due to carpooling/vanpooling.

Emissions reductions were also calculated for the public outreach/marketing program based on the results of Air Quality Alert day surveys. The staff took a very conservative approach to this estimate, calculating only emissions reductions associated with people carpooling in response to an alert day notification.

**TABLE 14 - Emission Reductions by Program from October 1, 2017 to September 30, 2018**

<b>Emission Reductions by Ozone Awareness Program from October 1, 2016 to September 30, 2017</b>						
#	Program	Emissions, lbs./Day			# of	Note
		VOC	NOx	PM <sub>2.5</sub>	Days	
1	Marketing/Public Outreach/Surveys including Employer/Employee Outreach, the Policy Exchange Foundation, and Jefferson County Department of Health Air Quality Alert	1.89	7.84	0.19	260	FY 2017
2	Clean Cities/Alternative Fuels-Hoover, Birmingham, Alabaster, Tarrant, BJCTA, ALDOT, Trussville, Alabama Power Company, Alagasco, and other Alternative Fuel Stations	5.47	610.49	19.19	312	Ethanol(E85), Biodiesel B20 &B100, Compressed Natural Gas (CNG), Propane, Hydrogen, and Electric
3	Idle Free Zone-UWCA/Johnson Group	0.91	0.00	0.04	180	weekdays
4	Emission Testing/Vehicle Repair- WRATT	1.55	0.13	0.00	365	32 cars repaired from 10/1/2016-9/30/2017
5	CommuteSmart Program, vanpool and carpool	7.21	35.37	0.81	253	working days
	<b>Maximum Daily Emissions Reductions</b>	<b>17.0</b>	<b>653.8</b>	<b>20.2</b>	<b>365</b>	lbs. per day (365 days maximum)
	<b>Total Emissions Reductions from October 1, 2016 to September 30, 2017</b>	<b>4,752</b>	<b>201,507</b>	<b>6,249</b>		lbs. per year

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# **Appendix A**

## **Alabama Clean Fuel Coalition Annual Report**

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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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During the spring, ACFC promoted and encouraged the participation of fleets from Jefferson and Shelby counties and across the State in five Public Information and Listening Sessions conducted by the Alabama Department of Economic and Community Affairs (ADECA) to provide current information related to the Volkswagen Settlement in Alabama and to gather input for the development of an Environmental Mitigation Plan (Alabama VW Plan) for the state. ACFC attended three of the five sessions which were held in Birmingham, Montgomery, Decatur, Bay

Minette, and Dothan. The Alabama VW Plan, when finalized by ADECA, will provide more than \$25 million of funding assistance for the reduction of diesel emissions in the State.

ACFC actively assisted the APCA partnership in promoting the program goals and objectives by conducting outreach efforts to community sectors and organizations in Jefferson and Shelby Counties. These outreach efforts included presentations on alternative fuels and advanced technology vehicles at the American Institute of Architecture Birmingham Chapter Electric Bus Demonstration Meeting and the Vestavia Hills Rotary Club; organizing, planning, and conducting a Propane Workshop at Lawson State Community College, a National Drive Electric Week Event at Brookwood Village, and manning an alternative fuel informational booth at the Alabama League of Municipalities Annual Meeting in Montgomery. In addition, ACFC conducted other similar outreach efforts across the state which included participants from the Birmingham region at the Alabama Chapter National Association of Fleet Administrators Southeast Region Annual Meeting, the US EPA Southeast Diesel Collaborative Annual Partners Meeting, and the Alabama Student Transportation Conference. These efforts also included: participating in numerous alternative fuels and APCA media events and responding to numerous media and consumer inquiries on alternative fuels and vehicles.

ACFC also attended all APCA Steering Committee meetings during the reporting period and reported on all ACFC projects and activities.

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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 2017 – SEPTEMBER 2018**

## **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 Dr. Corey Masuca, 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. 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 did outreach into 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<sub>2.5</sub>) and ozone (O<sub>3</sub>) during the period October 2017 – September 2018. “Air Quality Alerts” are forecasted one to two days before the date of the alert. JCDH provides PM<sub>2.5</sub> forecasts year-round and the Alabama Department of Environmental Management provides O<sub>3</sub> 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.

<b>Date of Alert</b>	<b>Forecast AQI Color</b>	<b>Actual AQI Color</b>	<b>Pollutant</b>
5/9/2018	Orange	Yellow	O <sub>3</sub>
6/6/2018	Orange	Yellow	O <sub>3</sub>
6/8/2018	Orange	Red	O <sub>3</sub>
7/26/2018	Orange	Yellow	O <sub>3</sub>

## **Contracts**

As part of the larger Memorandum of Agreement between the RPC and JCDH for FY2018 (October 2017 – September 2018), 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-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. The Baron Advance Meteorological Systems (BAMS) provides air quality forecast model information to JCDH and ADEM. Outreach materials for children were also a part of the FY2018 budget. The details of the JCDH’s budget are noted below.

	<b>OCT 2017 – SEP 2018</b>
<b>Birmingham Air Quality Website Maintenance by UAH</b>	\$18,200
<b>BAMS Subscription Meteorological Service</b>	\$48,000
<b>Outreach Giveaways</b>	\$5,800
<b>Total</b>	\$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<sub>2.5</sub> standard (35 µg/m<sup>3</sup>). Effective April 15, 2015, the EPA designated the Birmingham area as attainment of the 2013 annual PM<sub>2.5</sub> standard (12 µg/m<sup>3</sup>).

### **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 2017. This is because air monitoring data is on a calendar year basis (i.e., January 1, 2017 – December 31, 2017) and this report is based on a fiscal year basis (i.e., October 1, 2017 – September 30, 2018).

### ***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 4<sup>th</sup> highest daily 8-hour ozone value at each site over a 3-year period. The most recent 3-year monitoring period was 2015-2017. The ozone monitoring network consists of 7 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 2015-2017, no monitors violated the standard.

<b>8-Hour Ozone Design Values (2015-2017)</b>	
<b>Monitor</b>	<b>Design Value (ppb)</b>
Corner	64
Fairfield	66
Helena	66
Hoover	66
Leeds	63
McAdory	65
North Birmingham	66
Tarrant	68

***Fine Particulate Matter (PM<sub>2.5</sub>)***

Effective March 18, 2013, the EPA lowered the annual PM<sub>2.5</sub> standard to 12 µg/m<sup>3</sup>. A 3-year average of annual means is compared to the annual standard to determine compliance. The 24-hour PM<sub>2.5</sub> standard is a 3-year average concentration, based on the 98<sup>th</sup> percentile for each year, and is set at 35 µg/m<sup>3</sup>. The most recent 3-year monitoring period was 2015-2017. The fine particulate matter (PM<sub>2.5</sub>) monitoring network consists of 5 monitors throughout Jefferson County. The tables below display the annual and 24-hour design values for PM<sub>2.5</sub> at each monitor throughout Jefferson County. There were no violations of the annual and 24-hour PM<sub>2.5</sub> standards for 2015-2017.

<b>Annual PM<sub>2.5</sub> Design Values (2015-2017)</b>	
<b>Monitor</b>	<b>Design Value (µg/m<sup>3</sup>)</b>
Arkadelphia	11.0
Leeds	9.4
McAdory	9.0
North Birmingham	10.4
Wylam	9.5

<b>24-Hour PM<sub>2.5</sub> Design Values (2015-2017)</b>	
<b>Monitor</b>	<b>Design Value (µg/m<sup>3</sup>)</b>
Arkadelphia	22
Leeds	17
McAdory	18
North Birmingham	22
Wylam	18

### Air Quality Exceedances

Below are tables showing the exceedances of the 8-hour ozone standard from 2007 thru 2017 and exceedances of the 24-hour PM<sub>2.5</sub> standard from 2007 thru 2017. Note that the EPA lowered the 8-hour ozone standard in 2015 so there was a lower threshold to violate the standard.

**Exceedances of the 8-Hour Ozone Standard for 2007-2017**

Station	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Corner	3	5	0	1	4	1	1	0	0	1	0
Fairfield	3	3	1	2	2	5	0	0	2	2	0
Helena	3	7	1	2	4	4	0	1	2	4	0
Hoover	3	5	2	4	7	3	0	0	2	2	0
Leeds	2	3	1	2	5	4	0	0	0	1	0
McAdory	3	3	1	3	7	4	0	0	0	2	0
N. Birmingham	2	5	0	1	5	6	0	0	4	3	1
Pinson	2	6	0	3	2	3					
Providence	3	1	0	3	4	2					
Tarrant	2	5	1	8	9	6	1	0	4	3	1
<b>Total</b>	<b>26</b>	<b>43</b>	<b>7</b>	<b>29</b>	<b>49</b>	<b>38</b>	<b>2</b>	<b>1</b>	<b>14</b>	<b>18</b>	<b>2</b>

**Exceedances of the 24-Hour Fine Particulate Matter (PM<sub>2.5</sub>) Standard  
for 2007 - 2017**

Station	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Arkadelphia								0	0	0	0
Leeds	12	0	0	0	0	0	0	0	0	0	0
McAdory	2	0	0	0	0	0	0				
N. Birmingham	24	7	0	0	1	0	0	0	0	0	0
Wylam	9	5	0	0	2	0	0	0	0	0	0
<b>Total</b>	<b>47</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

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# **Appendix C**

## **Advance Consulting, LLC. Annual Report**

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## **Advanced Consulting Annual Report**

### **October 1, 2017 – September 30, 2018**

Company Events-                   **30**

Community Events-               **87**

Total Events-                   **117**

Total Pledge Cards from Company Events: **1,581**

Total Pledge Cards from Community Events: **5,984**

**Total Pledge Cards/ Company and Community Events- 7,565**

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

From October 2017 to September 2018, Advanced Consulting continued to work on keeping and building relationships with current corporations, but they also worked on getting the message out to the community through community events and programs.

Advanced Consulting spoke to and attended 30 company and civic events and 87 community events. Advanced Consulting also had a total of 7,565 pledge cards signed through the 117 company, civic group, and community events attended.

### **2017-2018- Children's of Alabama New Employee Orientation Meetings**

**Children NEO Events: 23**

**Pledge Cards: 903**

Oct 2, 2017                   30 attendees                   30 pledge cards

Oct 16, 2017               42 attendees               42 pledge cards

Oct 30, 2017               18 attendees               18 pledge cards

Nov 13, 2017               31 attendees               31 pledge cards

Nov 27, 2017               18 attendees               18 pledge cards

Dec 11, 2017	25 attendees	25 pledge cards
Jan 8, 2018	25 attendees	25 pledge cards
Jan 22, 2018	33 attendees	33 pledge cards
Feb 5, 2018	47 attendees	47 pledge cards
Feb 19, 2018	41 attendees	41 pledge cards
Mar 5, 2018	18 attendees	18 pledge cards
Mar 19, 2018	23 attendees	23 pledge cards
April 2, 2018	27 attendees	27 pledge cards
April 16, 2018	25 attendees	25 pledge cards
April 30, 2018	32 attendees	32 pledge card
May 14, 2018	55 attendees	55 pledge cards
June 11, 2018	77 attendees	77 pledge cards
June 25, 2018	57 attendees	57 pledge cards
July 9, 2018	75 attendees	75 pledge cards
July 23, 2018	38 attendees	38 pledge cards
Aug 6, 2018	38 attendees	38 pledge cards
Aug 20, 2018	39 attendees	39 pledge cards
Sept 17, 2018	80 attendees	80 pledge cards

**Other Company Events:**

**Other Company Events: 7**

**Total Pledge Cards from Other Company Events: 678**

Oct 17, 2017	Bio-Horizons	150 attendees	54 pledge cards
Feb 7, 2018	UAB Health Fair	200 attendees	71 pledge cards
April 24, 2018	Mercedes	150 attendees	73 pledge cards

April 25, 2018	Mercedes	75 attendees	57 pledge cards
May 3, 2018	JCDH	200 attendees	58 pledge cards
May 24, 2018	Bio-Horizons	150 attendees	53 pledge cards
June 6, 2018	Children's Health Fair	375 attendees	312 pledge cards

**Total Pledge Cards from Children's NEO and Other Company Events: 1,581**

**Community Events**

<b>2017</b>	<b>Event</b>	<b>Attendees</b>	<b>Pledge Cards</b>
Oct 5	Southern Women's Show	1000	48
Oct 7	Butterbean Festival/ Pinson	4,000	121
Oct 7	Ensley Party w/a Purpose	500	106
Oct 7	Homewood Fire and Safety Day	100	28
Oct 1	Shelby Iron Works	100	55
Oct 14	Heritage Festival/ JCA/Irondale	200	67
Oct 14	Comm Health Fair/ Montevallo	100	25
Oct 20	Shelby Senior Summit	300	76
Oct 21	Oak Ridge Fun Day	100	39
Oct 21	Pratt City Red Ribbon Day	200	48
Oct 28	Warrior Day	600	66
Oct 29	Howling at The Moon/Fultondale	300	81
Nov 11	Harpersville Day	400	106
Nov 12	Barktober Fest/ Helena	600	67
Nov 16	Paul Mitchell Cosmetology Hoover	50	22

<b>Community Events Continued- 2018</b>		<b>Attendees</b>	<b>Pledge Cards</b>
Dec 5	Fam Involve. Program/Bham City	80	72
January 2018 No Community Events			
February 2018 No Community Events			
Mar 15	ADRS Teen Career Fair	200	116
Mar 20	UAB Volunteer Fair	200	41
Mar 22	Birmingham City Parent Camp	100	67
April 7	Woodlawn Street Festival	400	73
April 11	BCBS Nat Walk at Lunch/Lynn P.	2000	360
April 13	Shelby Co. DHR Resource Fair	100	42
April 21	Montevallo Art Festival	300	74
April 21	Earth Day Botanical Gardens	300	135
April 21	Party for the Planet/ Bham Zoo	300	52
April 21	107 Days to Better Health Expo	100	41
April 25	BCBS Nat Walk at Lunch/HQ	300	142
April 26	Shelby County Senior Picnic	500	123
April 26	Barron's Game	1000	85
April 28	Celebrate Hoover Day	3000	241
April 28	Calera Strawberry Festival	200	68
April 28	Pepper Place	500	120
May 5	We Love Homewood Day	800	100
May 5	Alabama Folk Fair/ Bessemer	150	92
May 6	Market on a Shoe String	200	64

<b>Community Events Continued- 2018</b>		<b>Attendees</b>	<b>Pledge Cards</b>
May 11	Arc Stories	250	15
May 12	Eastlake Farmer's Market	100	62
May 12	BCBS Take the Challenge/ RR Park	100	52
May 15	Trussville Tuesday Market	150	38
May 18	Pinson Farmer's Market	100	34
May 19	Killough Springs Health Fair	100	55
May 19	Community Yard Sale/Agape Church	100	63
May 19	Leeds Creek Bank	300	76
May 22	Rocky Ridge Farmer's Market	100	31
June 2	Alabaster Festival	1000	120
June 2	West Homewood City Fest	200	60
June 3	Vulcan's Birthday Bash	300	111
June 4	Montevallo Farmer's Market	150	45
June 6	Ensley Health Fair	100	19
June 7	Leeds Farmer's Market	50	20
June 7	Bessemer Farmer's Market	50	25
June 9	Eastlake Fishing Rodeo	200	72
June 9	Summer Market (McCalla)	100	43
June 9	Unity in the Community Midfield	100	44
June 16	The Market Place/ Good People	200	48
June 19	West Homewood Farmer's Market	200	40
June 21	CenterPoint Farmer's Market	150	17

<b>Community Events Continued- 2018</b>		<b>Attendees</b>	<b>Pledge Cards</b>
June 23	Eastlake Farmer's Market	100	15
June 23	Cahabazaar	500	80
June 23	Single Mom (McWane Center)	100	57
June 30	Columbiana Liberty Day	500	77
July 2	I Love America Night/Vestavia	300	57
July 7	OTBP Market Days/ McCalla	100	32
July 7	Oakridge Church/ Com. Yard Sale	100	39
July 14	Lee Branch Farmer's Market	100	63
July 19	Gardendale Farmer's Market	100	52
July 21	Helena Market Days	50	46
July 21	Valleydale Farmer's Market	75	36
July 28	Vincent In the Park	300	129
July 30	Montevallo Farmer's Market	100	41
Aug 4	Eastlake Farmer's Market	100	42
Aug 7	West Homewood Farmer's Market	200	48
Aug 8	Eastwood Pharmacy Health Fair	100	45
Aug 10	Dannon Project Back to School Bash	100	44
Aug 11	Woodlawn Street Market	500	102
Aug 17	Fox 6 Woman's Health Fair	500	175
Aug 18	Community Day/ Pratt City	100	38
Aug 18	NAACP Non-Violence Block Party	150	63
Aug 25	Lee Branch Farmer's Market	150	41

<b>Community Events Continued- 2018</b>		<b>Attendees</b>	<b>Pledge Cards</b>
Aug 25	Fultondale Founder's Day	500	69
Sept 8	Pepper's Place Farmer's Mark.	500	71
Sept 8	Community Eco Fair	100	22
Sept 8	Norwood Craft Fair	100	36
Sept 8	National Drive Electric/UAB	50	10
Sept 14	Wellness Senior H& W Fair	300	160
Sept 15	Sun Valley N A Health Expo	75	40
Sept 29	Whistle Stop Leeds	500	101
<b>Total Pledge Cards for Community Events:</b>		<b>5,984</b>	

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# **Appendix D**

## **WRATT Foundation Annual Report**

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**Alabama Partners for Clean Air  
Car Care Program Final Report**

**October 1, 2017 – September 30, 2018**

**Administered by:**



**200 Century Park South  
Birmingham, Alabama 35226**

**Contact:**

**Dr. Chip Miller  
Project Manager**

**Mr. Wesley Speed  
Assistant Project Manager**

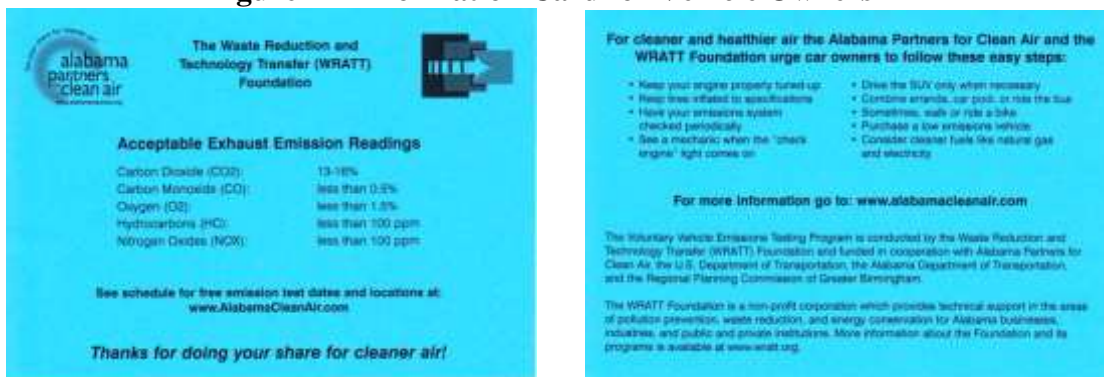
**October 12, 2018**

## PROGRAM DESCRIPTION

The current Car Care Program began in January of 2008 and has continued annually through 2018. The program is comprised of four major functions:

7. The program creates public awareness of ground-level ozone pollution by emphasizing the importance of vehicle maintenance primarily for vehicle emission control systems.
8. Testing of vehicle emissions is performed at various Express Oil Change (EOC) locations to identify those vehicles that are contributing to air quality issues in the area. During testing events, vehicle exhaust is analyzed for the regulated pollutants -- unburned hydrocarbons (HC/ppm), carbon monoxide (CO%) and nitrogen oxides (NOx/ppm) -- as well as carbon dioxide (CO2%) and oxygen (O2%) as measures of combustion efficiency. In addition to receiving information from WRATT representatives during testing, owners are given an information card and a copy of the test results for their vehicle. This helps build awareness of the need to control these emissions. Note that acceptable parameters for each gas are listed on the information card and explained to each vehicle owner after the test.

**Figure 1 – Information Card for Vehicle Owners**



**Figure 2 – Sample Results Printout for Vehicle Owners**

APCA VEHICLE EXHAUST GAS ANALYSIS  
PERFORMED BY WRATT FOUNDATION

DATE: \_\_\_\_\_

VEHICLE: \_\_\_\_\_

5 GAS RESULTS

CO2 = 15.1  
CO = .01  
O2 = 0.1  
HC = 30  
NOX = 12

**CLEAN**

9. WRATT used two two-man teams working two to three days per week from March through September. One team made measurements using an EMS Model 5001 5-Gas Analyzer and the other used an EMS Model 5002 5-Gas analyzer. The Mod 5002 Analyzer enabled measurement of the vehicles' Air/Fuel ratio as well as the other gases. Additionally, 50-foot hoses for probes were used to give team members greater access to vehicles at all station bays. When appropriate diagnostic trouble codes (DTC) were read from the vehicle's OBD-II computer with an INNOVA Model 3100 code reader.
10. At on-site testing, vehicles identified as having emissions problems are referred to the Car Care Program's repair regimen that may subsidize the repair cost of the vehicle within certain parameters. The goal is to decrease release of automotive pollutants by encouraging owners to undertake qualified repairs by making these repairs more affordable.

### **Restrictions and Limitations for Qualification Under the 2018 Car Care Program (CCP)**

- CCP pays 80% of repair costs up to a limit of \$700. The car owner (not a business or third party) must pay the remaining 20% plus any cost exceeding the \$700 limit;
- The car must have fewer than 150,000 miles on its odometer;
- The car must be 12 years old or less based on date (mo./yr.) manufactured;
- The repair must be directly related to diminished control of vehicle emissions (as indicated by exhaust gas analysis and OBD-II code). For example, replacement of mufflers/repairing exhaust leaks are not qualified repairs under the CCP. Typical repairs have included, but are not necessarily limited to, catalytic converters, O<sub>2</sub> sensors, EVAP systems, EGR systems, MAF and MAP sensors);
- The car must be registered in Jefferson or Shelby Counties or car owner must be able to prove residency in either Jefferson or Shelby Counties (e.g., address on driver license, address on pay stub, rental/lease agreement);
- Car owner has 60 days from the date qualified to make the repair at a participating Express Oil Change facility;
- Only one repair qualification is allowed per vehicle;
- Cars under manufacturer's or extended warranties are not eligible, e.g., 8yr/80,000mi emissions control device (catalytic converter) warranty;
- Fleet or company-owned vehicles are not eligible;
- Vouchers issued for repairs have no intrinsic cash value and are not to be bartered or sold.

### **OVERVIEW STATISTICS**

The following statistics apply to the program during the reporting dates October 1, 2017 through September 30, 2018. There were:

- 126 testing events at EOC locations each staffed by 2 WRATT technicians;
- 2560 Vehicles Tested (an average of ca. 20 vehicles per event);
- Over 20,000 data points recorded on-site (all data spreadsheets are presented in the Appendix attached to this report);
- 67 Vehicles Qualified for Repair (about 2.1% of those tested); and

- 44 qualified vehicles were repaired (about 66% of those qualified)

The following table provides a summary of the emissions test statistics for 2018 along with comparable data for 2017:

**Cumulative Results for the Testing Program follow:**

**2017-2018 EOC Monthly Emissions Testing Report -- Prior year comparison**

<b>Month</b>	<b>Events</b>	<b>Number Tested</b>	<b>Qualified</b>	<b>#Repaired</b>
Begin 2017 Testing:				
January 2017	0	0	0	0
February 2017	0	0	0	0
March 2017	20	323	10	6
April 2017	19	284	10	5
May 2017	21	349	6	2
June 2017	18	288	7	6
July 2017	13	182	6	3
August 2017	21	341	8	3
September 2017	16	263	5	7
October 2017	0	1	1	4
November 2017	0	1	1	3
December 2017	0	0	0	0
<b>2017 Year's Totals</b>	<b>128</b>	<b>2032</b>	<b>54</b>	<b>39</b>
Begin 2018 Testing:				
January 2018	0	0	0	0
February 2018	0	0	0	0
March 2018	20	409	18	6
April 2018	18	303	6	6
May 2018	21	474	14	10
June 2018	18	358	9	5
July 2018	15	283	5	5
August 2018	18	400	7	7
September 2018	16	333	8	5
<b>2018 YTD Totals</b>	<b>126</b>	<b>2560</b>	<b>67</b>	<b>44</b>

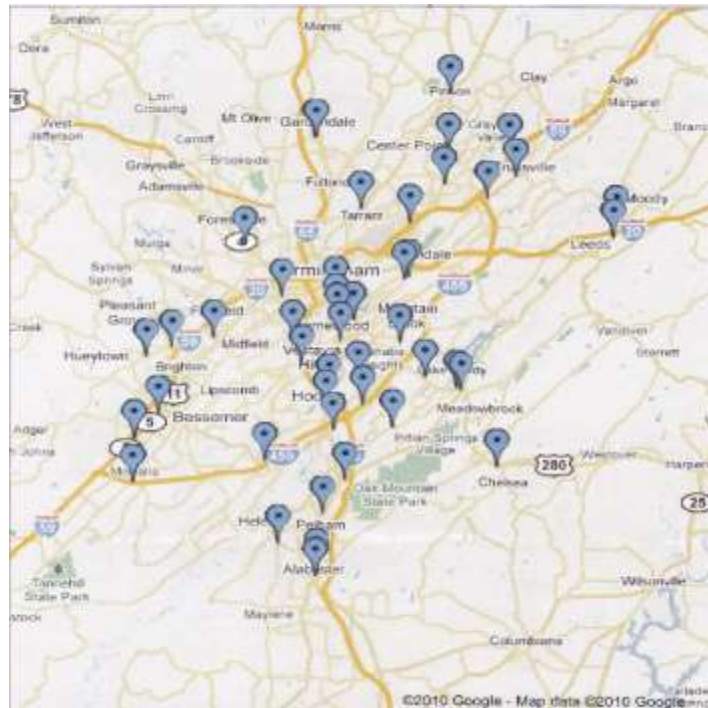
## **REPAIR STATISTICS**

The repairs were performed at various Express Oil Change locations. The average mileage of these vehicles was about 120,000 miles. The total amount of Car Care Program repair expenditures for these vehicles was about \$25,500. Total repair cost was approximately \$42,500. The average cost per repair was about \$580 for Car Care, and \$970 total. A breakdown of these repairs is shown in Table 2. below (several cars had more than one emissions system repaired during their repair visit):

**Table 2 – Emission System Type and Number of Repairs**

<b>Repair</b>	<b>Number Performed</b>
O <sub>2</sub> Sensor	7
Catalytic Converter	29
EVAP System	7
Other	3
<b>Total</b>	<b>46</b>

**Figure 3. Map of Test Sites**



The map of test sites in Figure 3 above shows the geographic area served by the Car Care Program. The map indicates that the program offered broad and representative coverage of Jefferson and Northern Shelby counties. Other events were held at Alabama Power Company, and Jefferson County Department of Health..

**AVERAGE COST OF MOST COMMON REPAIRS**

Using the vehicles in which only one repair was performed, Table 3 shows the frequency of the three most common emissions repairs and the average cost of these repairs to the Car Care Program (at 80% reimbursement up to \$700) and total cost of the repair:

**Table 3 – Most Common Repairs**

<b>Component</b>	<b><u>REPAIR</u></b>	<b><u>AVG CAR CARE COST</u></b>	<b><u>AVG TOTAL COST</u></b>
<b>Oxygen Sensors</b>	<b>15%</b>	<b>\$325</b>	<b>\$545</b>
<b>Catalytic Converters</b>	<b>63%</b>	<b>\$670</b>	<b>\$875</b>
<b>Evaporative Emission</b>	<b>15%</b>	<b>\$460</b>	<b>\$575</b>

**CONCLUSION**

An important part of the Car Care Program is education of vehicle owners concerning the need for proper maintenance of their vehicles. A second but equally important step is encouraging owners to repair emissions-related problems when a Fix on Fail (FOF) occurs, i.e., when a malfunction indicator lamp (MIL) is first observed. Prompt attention to these issues can often result in savings on future repairs of more costly items such as O<sub>2</sub> sensors and catalytic converters.

It should be emphasized that the WRATT team is making measurements at idle and not performing an I/M240 (dynamometer) measurement. Vehicles would need to be tested under a “load” (i.e. driving down the interstate or on a dynamometer) to make many problems manifest themselves via exhaust gas analysis alone.

It should also be noted that many states have abandoned the I/M240 test in favor of monitoring the vehicle’s DTC-MIL for certification because it allows more comprehensive assessment of all functions and interactions of the emissions control system and is much less costly to the car owner. WRATT also makes DTC (OBD-II reads) for confirmation of under-performing emissions control systems. It is important to note that in all cases where repairs were made, the MIL remained off indicating that the emissions problem was successfully mitigated.



Typical Emissions Test Events









# **Appendix E**

## **Emissions Reductions Worksheets**

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**Emission Reductions by Ozone Awareness Program from October 1, 2017 to September 30, 2018**

#	Project	Emissions, Kilograms/Day			# of	Note
		VOC	NOx	PM <sub>2.5</sub>	Days	
1	Marketing/Public Outreach/Surveys including Employer/Employee Outreach, Advanced Consulting, and Jefferson County Department of Health Air Quality Alert	2.67	4.96	0.24	260	FY 2018
2	Clean Cities/Alternative Fuels-Hoover, Birmingham, Alabaster, Tarrant, BJCTA, ALDOT, Trussville, Alabama Power Company, Alagasco, and other Alternative Fuel Stations	14.38	72.61	9.40	365	Ethanol(E85), Biodiesel B20 & B100, Compressed Natural Gas (CNG), Propane, Hydrogen, and Electric
3	Idle Free Zone-UWCA/Johnson Group	1.11	0.03	0.07	180	weekdays
4	Emission Testing/Vehicle Repair-WRATT	1.76	0.37	0.00	365	44 cars repaired from 10/1/2017-9/30/2018
Maximum Daily Emissions Reductions		19.9	78.0	9.7	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, 2017 - September 30, 2018 2/5/2019

Description	Assumption	Units
<b>Jefferson County</b>		
Estimated commuters to work in year 2015 [1]	281,559	persons
Assuming at least two trip reductions per person	2	trips per day
Number Affected days by Air Quality Alert days for FY 2018 season [2]	12	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 Ozone Alert days	57.02%	%
Percentage out of the 57.02% people taking carpool/bus/telecommuting due to Ozone Aw	4.62%	%
<b>Shelby County</b>		
Estimated commuters to work in year 2015	94,644	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 Ozone Alert days	51.85%	%
Percentage out of the 51.85% people taking carpool/telecommuting due to Ozone Aware	7.14%	%
VMT reduced per day during Ozone Season	155,423	veh-miles per day
VOC emission rate at 50mph for freeway and 20mph for non-freeway [4]	0.168837	grams/mile (2018)
NOx emission rate at 50mph for freeway and 20mph for non-freeway	0.313318	grams/mile (2018)
PM 2.5 Direct emission rate at 50mph for freeway and 20mph for non-freeway	0.015402	grams/mile (2018)

Note: For benefit of emission reductions, Marketing/public outreach, Jefferson County Department of Health EMPACT/Forecast, and the Policy Exchange Foundation (PEF) Employer/Employee Outreach are considered as one program.

[1] 2015 5-year American Community Survey (ACS) Report - Commuters

[2]: All four alert days are in weekdays in FY 2018. Assuming one day before and three days after will be affected (weekends excluded).

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

[4]: Passenger automobile running emission rates, grams per mile based on rpegb's MOVES2014b run for year 2018; VOC= Volatile Organic Compounds, NOx=Oxides of Nitrogen

PM = Particulate Matters; PM 2.5 Direct = PM 2.5 total + PM 2.5 Brakewear + PM 2.5 Tirewear. Gas vehicles are at 45% freeway and 55% non-freeway

Passenger cars 75%, passenger truck 25%

**Emission Reductions and Cost Effectiveness**

VOC_d Reductions = (VMT Reduced) x ( VOC per mile emissions rate)		
= (VMT reduced) x 0.243 g/mile		Convert to 260 days
314,893 grams for 15 Air Quality alert affected weekdays		314,893 grams per year
26,241 grams per Alert day		1.21 kilograms/day (for 260days)
57.8 lbs per Alert day, 1 kilogram = 2.2046 lbs.		2.67 lbs/day (for 260 days)
NOx_d Reductions = (VMT Reduced) x ( NOx per mile emissions rate)		
= (VMT reduced) x 1.082 g/mile		Convert to 260 days
584,361 grams for 15 Air Quality alert affected weekdays		584,361 grams per year
48,697 grams per Alert day		2.25 kilograms/day (for 260days)
107.3 lbs per Alert day		4.95 lbs/day (for 260 days)
PM 2.5 Direct Reductions = (VMT Reduced) x ( PM per mile emissions rate)		
= (VMT reduced) x 0.0188 g/mile		Convert to 260 days
28,726 grams for 15 Air Quality alert affected weekdays		28,726 grams per year
<b>2,394</b> grams per Alert day		0.11 kilograms/day (for 260days)
5.3 lbs per Alert day		0.24 lbs/day (for 260 days)
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 <sup>[4]</sup>	\$238,500	capital cost
Project annual cost (AC) = ( C)*(CRF)	\$240,884	\$ per year
Number of days project affected during Ozone Season per year (D)	2	Alert days per year
Cost Effectiveness for VOC = (AC) / ((VOCd)*(D))	\$765	\$ per kilogram per year
Cost Effectiveness for NOx = (AC) / ((NOxd)*(D))	\$412	\$ per kilogram per year
Cost Effectiveness for VOC & NOx = (AC) / (((VOCd)+(NOxd))*(D))	\$268	\$ per kilogram per year
Cost Effectiveness for PM 2.5 Direct = (AC)/((PM2.5)*(D))	\$8,386	\$ per kilogram per year



#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, 2017 to September 30, 2018			2/5/2019
Description	Assumption	Note	
(1) Gasoline gallon equivalent of ethanol E85[1]	239,433	gallons for fiscal year 2018	
Gasoline gallon equivalent of biodiesel B20	4,400	gallons for fiscal year 2018	
Gasoline gallon equivalent of biodiesel B100	2,317	gallons for fiscal year 2018	
Gasoline gallon equivalent of Hydrogen	641	gallons for fiscal year 2018	
Gasoline gallon equivalent of Compressed Natural Gas (CNG) for bus	1,150,368	gallons for fiscal year 2018	
Gasoline gallon equivalent of CNG for non-bus and Liquefied Nature Gas (LNG)	888,217	gallons for fiscal year 2018	
Gasoline gallon equivalent of Propane, Liquefied petroleum gas	23,296	gallons for fiscal year 2018	
Gasoline gallon equivalent of Electric Car	52,142	gallons for fiscal year 2018	
Assuming average vehicle miles per gallon for bus, CNG	6.0	miles per gallon	
Assuming average vehicle miles per gallon for CNG, ethanol and propane based vehicles	20.0	miles per gallon	
Assuming average vehicle miles per gallon for light commercial truck biodiesel	7.8	miles per gallon	
Assuming average vehicle miles per gallon for passenger vehicles	23.6	miles per gallon	
Estimated bus miles traveled (VMTcngbus) based on CNG [2]	6,902,208	vehicle miles per year	
Estimated vehicle (light truck) miles traveled (VMTcngv) based on CNG	6,928,093	vehicle miles per year	
Estimated vehicle miles traveled (VMTe85) based on ethanol (E85)	4,788,660	vehicle miles per year	
Estimated vehicle miles traveled (VMTb20) based on Biodiesel (B20 and B100)	134,340	vehicle miles per year	
Estimated vehicle miles traveled (VMTh) based on Hydrogen	3,846	vehicle miles per year	
Estimated vehicle miles traveled (VMTpropane) based on Propane	465,920	vehicle miles per year	
Estimated vehicle miles traveled (VMTelectric) based on electric car	1,230,551	vehicle miles per year	
(2) Total daily Vehicle Mile Traveled reductions	0	vehicle miles per year	
(3) Potential Emission Reductions: alternative fuel vs Gasoline [3]			
(a) Diesel & CNG bus emission rate at a average speed 10 mph			
VOC emission rate for Diesel Bus	0.46554	grams/mile (2018)	
NOx emission rate for Diesel Bus, Noxbbux	3.94285	grams/mile (2018)	
PM 2.5 emission rate for Diesel Bus	0.18610	grams/mile (2018)	
VOC emission rate for CNG Bus	0.34113	grams/mile (2018)	
NOx emission rate for CNG Bus	2.39051	grams/mile (2018)	
PM 2.5 emission rate for CNG Bus	0.07032	grams/mile (2018)	
Bus VOC emission rate deference after converting Diesel to CNG, VOCbus	0.12441	grams/mile (2018)	
Bus NOx emission rate difference after converting from Diesel to CNG, Noxbux	1.55235	grams/mile (2018)	
Bus PM 2.5 emission rate difference after converting from Diesel to CNG, PM25bus	0.11579	grams/mile (2018)	
(b) Estimated emissions reduction for CNG other vehicles (light commercial truck diesel at 20mph for non freeway urban-50mph freeway)			
CNG other vehicle percentage reduction of VOC	26.7	% of reduction	
CNG other vehicle percentage reduction of NOx	0.0	% of reduction	
CNG other vehicle percentage reduction of PM 2.5	62.2	% of reduction	
VOC emission rate for light weight vehicles, diesel	0.28873	grams/mile (2018)	
NOx emission rate for light weight vehicles, diesel	1.25988	grams/mile (2018)	
PM 2.5 emission rate for light weight vehicles, diesel	0.00196	grams/mile (2018)	
CNG VOC emission rate difference for CNG vehicles, VOCav	0.07716	grams/mile (2018)	
CNG NOx emission rate difference for CNG vehicles, Noxav	0.00000	grams/mile (2018)	
CNG PM 2.5 emission rate difference for CNG vehicles, PM25v	0.00122	grams/mile (2018)	
(c) E85 passenger vehicle at 20mph for non freeway & 50mph for freeway urban			
VOC emission rate for gasoline passenger vehicles	0.16884	grams/mile (2018)	
NOx emission rate for gasoline passenger vehicles	0.31332	grams/mile (2018)	
PM 2.5 emission rate for gasoline passenger vehicles	0.01540	grams/mile (2018)	
VOC emission rate for E85 passenger vehicles	0.01627	grams/mile (2018)	
NOx emission rate for E85 passenger vehicles	0.09072	grams/mile (2018)	
PM 2.5 emission rate for E85 gasoline passenger vehicles	0.00395	grams/mile (2018)	
E85 VOC emission rate difference for passenger vehicles, VOcea	0.15257	grams/mile (2018)	
E85 NOx emission rate difference for passenger vehicles, Noxea	0.22260	grams/mile (2018)	
E85 PM 2.5 emission rate difference for passenger vehicles, PM25ea	0.01146	grams/mile (2018)	
(d) B20 & B100 emissions rate reduction for passenger vehicle at 20mph for non freeway and 50mph for freeway urban			
B20 & B100 percentage reduction of VOC	21.1	% of reduction	
B20 & B100 percentage reduction of Nox	0.0	% of increase	
B20 & B100 percentage reduction of PM 2.5	10.1	% of reduction	
VOC emission rate for gasoline passenger vehicles	0.16884	grams/mile (2018)	
NOx emission rate for gasoline passenger vehicles	0.31332	grams/mile (2018)	

PM 2.5 emission rate for gasoline passenger vehicles	0.01540	grams/mile (2018)
B20 & B100 VOC emission rate difference for passenger vehicles, VOCabv	0.03562	grams/mile (2018)
B20 & B100 NOx emission rate difference for passenger vehicles, Noxabv	0.00000	grams/mile (2018)
B20 & B100 PM 2.5 emission rate difference for passenger vehicles, PM25abv	0.00156	grams/mile (2018)
(e) Hydrogen emissions rate reduction for bus		
Hydrogen percentage reduction of VOC	100.0	% of reduction
Hydrogen percentage reduction of Nox	100.0	% of increase
Hydrogen percentage reduction of PM 2.5	50.0	% of reduction
VOC emission rate for Diesel Bus	0.46554	grams/mile (2018)
NOx emission rate for Diesel Bus	3.94285	grams/mile (2018)
PM 2.5 emission rate for Diesel Bus	0.18610	grams/mile (2018)
Hydrogen VOC emission rate difference, VOCah	0.46554	grams/mile (2018)
Hydrogen NOx emission rate difference, Noxah	3.94285	grams/mile (2018)
Hydrogen PM 2.5 emission rate difference, PM25ah	0.09305	grams/mile (2018)
(f) Propane emissions rate reduction for passenger vehicle at 20mph for non freeway and 50mph for freeway urban		
Propane percentage reduction of VOC	90.0	% of reduction
Propane percentage reduction of NOx	90.0	% of reduction
Propane percentage reduction of PM 2.5	50.0	% of reduction
VOC emission rate for gasoline passenger vehicles	0.10012	grams/mile (2018)
NOx emission rate for gasoline passenger vehicles	0.41772	grams/mile (2018)
PM 2.5 emission rate for gasoline passenger vehicles	0.01031	grams/mile (2018)
Propane VOC emission rate difference for passenger vehicles, VOCap	0.09011	grams/mile (2018)
Propane NOx emission rate difference for passenger vehicles, Noxap	0.37595	grams/mile (2018)
Propane PM 2.5 emission rate difference for passenger vehicles, PM25ap	0.00516	grams/mile (2018)
(g) Electric Car emissions rate reduction for passenger vehicle at 20mph for non freeway and 50mph for freeway urban		
Electric Car emissions rate VOC	0.000000	grams/mile (2018)
Electric Car emissions rate NOx	0.000000	grams/mile (2018)
Electric Car emissions rate PM 2.5	0.003312	grams/mile (2018)
VOC emission rate for gasoline passenger vehicles	0.16884	grams/mile (2018)
NOx emission rate for gasoline passenger vehicles	0.31332	grams/mile (2018)
PM 2.5 emission rate for gasoline passenger vehicles	0.01540	grams/mile (2018)
Electric car VOC emission rate difference for passenger vehicles, VOCae	0.16884	grams/mile (2018)
Electric car NOx emission rate difference for passenger vehicles, Noxae	0.31332	grams/mile (2018)
Electric car PM 2.5 emission rate difference for passenger vehicles, PM25ae	0.012090	grams/mile (2018)
(5) VOC emission reduced [4]	<b>6.521</b>	kilograms per day
NOx emission reduced	<b>32.935</b>	kilograms per day
PM 2.5 Direct emission reduced	<b>4.263</b>	kilograms per day
VOC emission reduced in lbs. per day, 1 kilogram = 2.2046 lbs.	14.38	lbs. per day
NOx emission reduced in lbs. per day	72.61	lbs. per day
PM 2.5 Direct emission reduced in lbs. per day	9.40	lbs. per 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 [5]	\$46,265	capital cost
Project annual cost (AC) = (C)*(CRF)	\$46,728	\$ per year
Number of days project affected (D)	365	days for 1 year
Cost Effectiveness for VOC = (AC) / ((VOC)*(D))	\$19.63	\$ per kilogram per year
Cost Effectiveness for NOx = (AC) / ((NOx)*(D))	\$3.89	\$ per kilogram per year
Cost Effectiveness for VOC & NOx = (AC) / (((VOC)+(NOx))*(D))	\$3.24	\$ per kilogram per year
Cost Effectiveness for PM 2.5 = (AC) / ((PM2.5)*(D))	\$30.03	\$ per kilogram per year
Source: Regional Planning Commission Market Area, Alternative Fuels - Gallons or GGEs Dispensed, October 1, 2017 to September 30, 2018.		
[1] APCA Alternative Fuel Summary 2018		
[2] (Estimated Vehicle Miles Traveled) = (Gasoline gallon equivalent) x (Miles per gallon)		
[3] (Emissions rate changes) = (Emissions rates with regular fuel) - (Emission Rates with alternative fuels), emission rate is based on rpcgb's MOVES2014a run		
[4] (Emissions reduced) = Total of ((Estimated VMT) x (Emission rate difference))		
[5] Total project cost = Federal funds + match + program administration		

#3 - VOC, NOx, and PM 2.5 Potential Reduction Worksheet for Project 241: <b>Idle Free Zones</b>			
Encouraging parents sit in idling car in pick up waiting zone to turn off engines by UWCA/Johnson Group			2/5/2019
1. Criteria & Assumptions			
Description	Assumption	Note	
<b>(1) Data collection and assumptions</b>			
# of Schools involved	29		
Total # of Carpools ( C ) <sup>[1]</sup>	700	cars	
Target % of carpools will be switched to shutting off engine (P) <sup>[2]</sup>	88%	%	
Total # of cars whose engine shut off due to program (TV) = ( C ) x (P)	613	vehicles	
Average engine running times while waiting (T)	0.70	hours	
# of picking up per day (DP)	1	times per day per vehicle	
VOC idling emission rate per car (Rvoc) <sup>[3]</sup>	1.78754	grams/idle hour (2018)	
NOx idling emission rate (Rnox)	0.82560	grams/idle hour (2018)	
PM 2.5 idling emission rates (PMf)	0.08042	grams/idle hour (2018)	
VOC start up emission rate per car (Svoc)	0.42955	grams/veh-start (2018)	
NOx start up emission rate per car (Snox)	0.55536	grams/veh-start (2018)	
PM 2.5 start up emission rate per car (PMs)	0.00532	grams/veh-start (2018)	
<b>(2) Emission reduction calculations</b>			
VOC emissions reduced per day (VOC r) = (TV) x ((T) x (Rvoc) - (DP) x (Svoc))/1,000	<b>0.50</b>	kilograms/day	
NOx emissions reduced per day (NOx r) = (TV) x ((T) x (Rnox) - (DP) x (Snox))/1,000	<b>0.01</b>	kilograms/day	
PM 2.5 emissions reduced (PM) = (TV) x ((T) x (PMf) - (DP) x (PMs))/1,000	<b>0.03</b>	kilograms/day	
VOC emissions reduced per day (VOC r) in lbs., 1kilogram = 2.2046lbs.	1.11	lbs./day	
NOx emissions reduced per day (NOx r) in lbs.	0.03	lbs./day	
PM 2.5 emissions reduced (PM) in lbs.	0.07	lbs./day	
<b>(3) VMT reductions</b>	<b>0.00</b>	<b>vehicle miles/day</b>	
<b>(4) Cost Effectiveness = (annualized cost) / (annual emission reduction)--the lower number, the better</b>			
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)	\$59,024	capital cost	
Project annual cost (AC) = ( C )*(CRF)	\$59,614	\$ per year	
Number of days project affected per year (Day)	180	days per year	
Cost Effectiveness for VOC = (AC) / ((VOC r)*(Day))	\$658	\$ per kilogram per year	
Cost Effectiveness for NOx = (AC) / ((NOx r)*(Day))	\$23,960	\$ per kilogram per year	
Cost Effectiveness for total of VOC & NOx = (AC) / (((VOCr)+(NOxr))*(Day))	\$640	\$ per kilogram per year	
Cost Effectiveness for PM 2.5 = (AC) / ((PM)*(Day))	\$10,608	\$ per kilogram per year	
Note: Assumptions and Methodology are based on A Guide for Estimating the emission Effects and Cost-Effectiveness of projects Proposed for CMAQ Funding			
Prepared for Birmingham Regional Planning Commission, Prepared by ICF Consulting, August 9, 2002			
[1]: Source: estimates based on the participants			
[2]: Estimated target after program			
[3]: Estimated passenger car idling emission rate, grams per hour and car start up emissions for parking 30 minutes or less, based on project level emissions of MOVES2014b (turn off engine, park car , pick up child from school, and restart car. Assume average time is about 30 minutes. Emissions is given for a weekday of January 2018)			

#4 - VOC & NOx Emission Reduction Worksheet For Project 241, Voluntary Emission Testing/Vehicle Repair Program										
Waste Reduction And Technology Transfer (WRATT) Foundation: Testing car's emission and repairing the emission fault										
										updated 2/5/2019
(1) October 1, 2017 to September 30 2018[1]										
Car Repair Type[2]	# of Repair Type	Average VOC Emission Factor (g/mile)		Difference VOC (g/mile)	Average NOx Emission Factor (g/mile)		Difference NOx (g/mile)	Average Mileages Traveled of Vehicles after repaired	Sub_Total VOC (kilo/year)	Sub_Total NOx (kilo/year)
		Before Repair	After Repair		Before Repair	After Repair				
Catalytic Converter	29	0.46	0.06	0.40	0.13	0.03	0.10	17,383	201.64	50.41
Oxygen Sensor (O2)	7	0.44	0.02	0.42	0.10	0.00	0.10	17,383	51.11	12.17
Exhaust Gas Recirculation (EGR)	0	0.65	0.03	0.62	0.00	0.01	-0.01	17,383	0.00	0.00
Evaporative Emission System [2]	7	0.31	0.00	0.31	0.00	0.00	0.00	17,383	37.72	0.00
Other qualified repairs	3	0.00	0.00	0.00	0.00	0.00	0.00	17,383	0.00	0.00
Total reductions by kilos per year after repair									<b>290.47</b>	<b>62.58</b>
Total reductions by kilos/day after repair, 365 days									<b>0.80</b>	<b>0.17</b>
Total reductions by lbs./day after repair, 1 kilogram = 2.2046 lbs.									<b>1.75</b>	<b>0.38</b>
(2) 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)								\$176,183	capital cost	
Project annual cost (AC) = (C)*(CRF)								\$177,945	\$ per year	
Number of days project affected per year (Day)								365	days per year	
Cost Effectiveness for VOC = (AC) / ((VOC r)*(Day))								<b>\$919</b>	\$ per kilogram per year	
Cost Effectiveness for NOx = (AC) / ((NOx r)*(Day))								<b>\$4,265</b>	\$ per kilogram per year	
Cost Effectiveness for total of VOC & NOx = (AC) / (((VOCr)+(NOxr))*(Day))								<b>\$756</b>	\$ per kilogram per year	
PM 2.5 Cost Effectiveness for PM = (AC) / ((PMr)*(Day))								<b>NA</b>	\$ per kilogram per year	
[1]: Alabama Partners for Clean Air Car Care Program Report, October 1, 2017 - September 30, 2018.										
[2]: There are 44 vehicles repaired of 67 qualified vehicles in four repair types in FY 2018. 2,560 vehicles tested in the 126 testing events.										

#5 - Potential Emission Reduction for VOC, NOx, PM 2.5, and CO2			
for project 228: <b>Employer/Employee Outreach CommuteSmart - Rideshare program</b>		update: 3/5/2019	
Including Vanpool program (average 31 vans from October 1, 2017 to September 30, 2018) and Carpool program			
Description	Assumption	Note	
(1) Number of Vanpool vans (V)	31	vehicles (monthly average)	
Average van occupancy(VO)	6.60	people per van	
Percent of vanpoolers previously took carpools (P)	9.00	(% default)	
Vehicle Trips Eliminated(PT)	75,878	trips/year	
Van Passenger Vehicle Miles eliminated(PL)	4,171,146	miles/year	
Van trips (VT)	15,686	trips/year	
Estimated Van miles (VL)	744,848	miles/year	
Passenger trip length per trip (one way per van)	47.48	miles per trip	
Number of days project affected per year (D)	253	days per year	
Average auto occupancy(A)	1.09	people per car	
(2) Carpool Vehicle Miles Traveled Reduction (CM) 10/1/2016 to 9/30/2017	8,684,178	miles per year	
(3) Vehicle trips reduced (VTR) = (PT)/(A)	69,613	trips per year	
(4) VMT reductions of Vanpool = (PL)/(A)*(1-(P))	3,482,333	vehicle miles per year	
(5) Emission Rate			
Auto VOC emission rate at 50 mph for freeway and 20mph for non-freeway(VOCa)[1]	0.14682	grams/mile (2018)	
Auto NOx emission rate at 50 mph for freeway and 20mph for non-freeway(NOxa)	0.30636	grams/mile (2018)	
Auto PM 2.5 emission rate at 50 mph for freeway and 20mph for non-freeway, (PMa)	0.01398	grams/mile (2018)	
Auto CO2 Atmospheric emission rate at 50 mph for freeway and 20 mph for non-freeway (CO2a)	417.30315	grams/mile (2018)	
Van VOC emission rate at 50 mph for freeway and 20mph for non-freeway (VOCv) [2]	0.26114	grams/mile (2018)	
Van NOx emission rate at 50 mph for freeway and 20mph for non-freeway(NOxv)	0.56119	grams/mile (2018)	
Van PM 2.5 emission rate at 50 mph for freeway and 20mph for non-freeway, (PMv)	0.01691	grams/mile (2018)	
Van CO2 Atmospheric emission rate at 50 mph for freeway and 20 mph for non-freeway (CO2v)	512.67810	grams/mile (2018)	
(6) VOC reduced(AVOC)=((PL)/(A)*(1-(P))*(VOCa) - (VL)*(VOCv))/(D)+(CM)*(VOCa)	6.29	kilograms/day	
NOx reduced(ANox)=((PL)/(A)*(1-(P))*(NOxa)-(VL)*(Noxv))/(D)+(CM)*(NOxa)	13.08	kilograms/day	
PM 2.5 reduced(PM)=((PL)/(A)*(1-(P))*(Pma) - (VL)*(VOCv))/(D)+(CM)*(Pma)	0.62	kilograms/day	
CO2 Atmospheric reduced(PM)=((PL)/(A)*(1-(P))*(CO2a) - (VL)*(CO2v))/(D)+(CM)*(Pma)	18,558.33	kilograms/day	
VOC emission reduced in lbs. per day, 1 kilogram = 2.2046lbs.	<b>13.87</b>	lbs./day	
NOx emission reduced in lbs. per day	<b>28.84</b>	lbs./day	
PM 2.5 PM reduced(PM) in lbs. per day	<b>1.37</b>	lbs./day	
CO2 Atmospheric reduced in lbs. per day	40,913.68	lbs./day	
VOC emission reduced in kilograms/year, (AVOC)	1,592	kilograms/year	
NOx emission reduced in kilograms/year, (ANox)	3,309	kilograms/year	
PM 2.5 PM reduced(PM) in kilograms/year, (APM)	157	kilograms/year	
CO2 Atmospheric reduced in kilograms/year, (ACO2)	4,695,256	kilograms/year	
(7) 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) <sup>n</sup> * (i) / ((1+i) <sup>n</sup> - 1)	1.0100	capital recovery factor	
Project funding amount (C)	\$1,192,922	capital cost	
Project annual cost (AC) = (C)*(CRF)	\$1,204,851	\$ per year	
Cost Effectiveness for VOC = (AC) / (AVOC)	\$757	\$ per kilogram per year	
Cost Effectiveness for NOx = (AC) / (ANox)	\$364	\$ per kilogram per year	
Cost Effectiveness for total of VOC & NOx = (AC) / (AVOC)+(ANox)	\$246	\$ per kilogram per year	
PM 2.5 Cost Effectiveness = (AC) / (APM)	\$7,651	\$ per kilogram per year	
CO2 Atmospheric Cost Effectiveness = (AC) / (ACO2)	\$0.26	\$ per kilogram per year	
Note: Assumptions and Methodology are based on A Guide for Estimating the emission Effects and Cost-Effectiveness of projects Proposed for CMAQ Funding			
Prepared for Birmingham Regional Planning Commission, Prepared by ICF Consulting, August 9, 2002			
[1] Running emission rate 45% on freeway at average speed 50mph and 55% on non-freeway at 20mph for passenger cars based on MOVES2014b model runs 2018			
[2] Running emission rate 45% on freeway at average speed 50mph and 55% on non-freeway at 20mph for van based on MOVES2014b model runs 2018			

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# **Appendix F**

## **United Way of Central Alabama Annual Report**

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## United Way of Central Alabama Healthy Communities Annual Report

United Way of Central Alabama's (UWCA) Healthy Communities supports active modes of transportation and safe routes for non-drivers. The UWCA Healthy Communities initiative has undertaken this work because it has numerous benefits, including: increasing physical activity, improving air quality, increasing safety, traffic mitigation, and increased community engagement.

Healthy Communities' effort includes a school-oriented program to educate and encourage students on healthy lifestyle choices and working directly with cities to find ways to improve the physical environment to be more conducive for walking and biking. Included in our education and encouragement activities are walk and bicycle events both at the school and in the community. In support of these events, we distribute flyers, which note routes which have supportive active transportation infrastructure, and include information about how transportation-based decisions impact air quality.

In 2017-18, through various community events, Healthy Communities impacted 8,123 participants. In addition to events and education, our outreach efforts included information via the United Way of Central Alabama website, and a radio PSA. Other accomplishments include the highlights below:

- UWCA celebrated National Walk to School Day with events throughout the month of October, including being featured as part of Red Rock Tuesday with Jeh Jeh Pruitt on Tuesday, Oct. 3 at Midfield Elementary, and received additional media coverage on Wednesday, Oct. 4 at Hemphill Elementary. The Oct. 4 Walk to School Day event was in partnership with Children's AL, and a PSA ran on 105.5 as part of awareness leading up to the event.
- On March 6, 2018, the Birmingham City Council unanimously approved a Complete Streets ordinance that will guide future transportation projects within the city, a major step toward making Birmingham streets safer for all users. Under the policy, the city will establish short- and long-term goals and strategies for building more walking, biking and transit facilities within Birmingham. UWCA and other partners supported this effort to improve safety and air quality and increase physical activity.
- During the month of May we celebrated Bike Month and hosted several events. On May 4, 2018, we partnered with Bluff Park Elementary to celebrate National Bike to School Day with approximately two hundred students and parents participating. Also, numerous bicycle rodeos were hosted throughout the month at schools in conjunction with PE classes and field days, as well as one community event at Memorial Park. In celebration of Bike Month, our program also received nine new bicycles from Blue Cross Blue Shield of Alabama, and those bicycles are now part of the inventory we use to host bicycle rodeo events.
- In August 2018, Washington K8 School officially adopted a school travel plan that was created in partnership with UWCA, UAB, the school, and other community partners. The plan was

the culmination of a year-long effort to survey existing conditions, receive community input, and create recommended solutions to increase safety and walkability in the area.

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**Birmingham celebrates National Walk to School Day**



Today, students from Hemphill Elementary School in Birmingham participated in a "walking school bus" in celebration of [National Walk to School Day](#).

The event, which is one of over 5,000 events to take place nationwide, emphasizes the importance of safe routes to school and routine physical activity. The event is part of Hemphill's ongoing safe routes to school program, which includes a weekly walking school bus.





*"We have partnered with Hemphill Elementary School and [United Way](#) to bring a safety message to all of the kids and families about walking safely to school, how to walk safely in their neighborhood, and how to watch out for traffic to make sure they are watching for people who are driving distracted," stated Leslie Brown, Safe Kids Coordinator, Children's of Alabama.*

The coalition of groups participating in the Walk to School Day included, Hemphill Elementary School, United Way of Central Alabama, [Children's of Alabama](#) and Alabama Partners for Clean Air. City Councilwoman Shelia Tyson also spoke at the event.

The groups listed the following benefits walking to school provides for children, parents and the community.

#### **Benefits for children:**

- Participate in a physical activity as part of their day
- Learn more about their neighborhoods
- Learn what traffic signs mean and how to follow traffic rules
- Socialize with friends and get to know children of other ages
- Gain a sense of independence
- Arrive at school alert and ready to learn

#### **Benefits for parents:**

- Meet other families
- Enjoy physical activity before work
- Save gas required to drive to and from school
- Set positive and healthy examples for your child and children from the neighborhood

**Benefits for all:**

- Travel with fewer cars on the road
- Live with less air pollution
- Gain a sense of community
- Learn that walking is a viable transportation option



Photo by - Pat Byington, Bham Now

Nick Sims, Vice President of Community Initiatives for United Way passionately described why walk to school programs are important.

*"It's important because these students at the school need to know how important they are and how important their lives are. They need to know what opportunities they have in this world. A lot of these volunteers are mentors along the route. What do you do when you walk? You talk to a friend, get to know each other. That's part of what we do when we walk with these students. We mentor them, they make us laugh, we give them guidance, wish them a good day, it inspires both of us. It's a mutual aspect of community. We are here to support them."*

## Alarming Dangers in School Zones



### The Facts About Teen Pedestrians

5 /week

There are 5 teen pedestrian deaths every week in the United States.



There has been a 13% increase in the pedestrian death rate for 12-19 year olds since 2011.



In 2015, while teens ages 15-19 made up 26 percent of all children ages 0-19 years, they made up about half of the pedestrian fatalities.

We observed 39,000 middle and high school students and 56,000 drivers in school zones in 2016.

Distracted walking is on the rise. We observed it in 7 in 4 high school students and 1 in 6 middle school students.



Distracted teens were most likely to be wearing headphones or texting.



Unsafe street crossing behavior was observed in about 80% of students.



Unsafe drop-off or pick-up behavior was observed in nearly 1 in 3 drivers.



### What Communities Can Do to Protect Kids on the Move

Install proven interventions, like crosswalks, speed limits, visible signs and traffic lights.

Marked crosswalks were missing in 3 out of 10 observed crossings.



Set and enforce speed limits in school zones at no more than 20 mph.

Low speed limits (<math>\leq 20</math> mph) were observed in only about 4 out of 10 school zones.



Educate parents and students about dangerous walking and driving habits (e.g., crossing red block, texting or talking on the phone).



Implement and enforce school drop-off/pick-up policies.



For more information visit [safekids.org](http://safekids.org)

**SAFE**  
**KIDS**  
WORLDWIDE

# COMPLETE STREETS BHAM THE WAY FORWARD



Nearly **95%** of Birmingham residents drive or carpool to work, among the lowest non-motorized and transit travel-mode shares of any major U.S. metropolitan area.



More than **13%** of households within the City of Birmingham do not have access to a car.



Low-income households can spend up to **55%** of budget on transportation.

## RISK OF OBESITY



for each hour spent in a car  
for each additional kilometer walked

## PEDESTRIAN vehicle speed vs. fatality rate



More than **40%** of pedestrian deaths occur where there is no available crosswalk.



Residents are **65%** more likely to walk in a neighborhood with sidewalks.

## What are Complete Streets?

A Complete Streets approach to planning and transportation decisions ensures that city streets are safe for users of all ages and abilities.

## Who benefits from Complete Streets?

- Older Adults
- Children
- Families
- People with Disabilities
- Pedestrians
- Bikers
- Commuters
- Everyone!

## How do Complete Streets benefit neighborhoods?

- Improve safety
- Promote healthier living
- Support revitalization
- Enhance public transportation
- Accommodate all residents

## GET INVOLVED

Complete Streets Birmingham  
Follow our Facebook page for upcoming announcements.

[www.CompleteStreetsBirmingham.org](http://www.CompleteStreetsBirmingham.org)



School Travel Plan  
Safe Routes to School



August 8, 2018

Administrators and parents of students of Booker T. Washington K8 School are joining to improve safety and encourage more students to walk and bicycle to school. By implementing our Safe Routes to School Travel Plan, it is the vision of Washington K8 School to:

- Create a healthy and safe community for students and residents by enhancing the routes student use to walk and bicycle to school; and
- Improve students' health by increasing the number who walk and bicycle to school and by improving the air quality around schools.
- Overall to make travel to school safer, more convenient, and more enjoyable for kids to walk or bike to school.

As principal, I am fully supportive of Booker T. Washington K8 Safe Routes to School Travel Plan, and commit to work cooperatively with parents, students, and community partners to implement the plan.

Sincerely,



Mrs. Antonia Ishman  
Principal, Booker T. Washington K8 School



This Travel Plan is the result of a collaborative effort between Booker T. Washington K-8 Staff and Parents, United Way of Central Alabama, Gulf State Health Policy Center, and Goodwyn Mills Caywood. Key stakeholders during in planning process are:

Booker T. Washington

Dr. Antonia Ishman, Principal

Paula Boyd, Assistant Principal

Gulf State Health Policy Center

Bianca Hawk, MPH, MSW, Program Manager

Birmingham Area Coalition Members

United Way of Central Alabama

Nick Sims, Vice President, Community Initiatives

Rachael Leonard, Safe Routes Coordinator

Consultant Team

Goodwyn Mills Caywood (GMC)

The development of this plan was supported by funding from CDC-REACH and Alabama Partners for Clean Air.

INTRODUCTION

Booker T. Washington K-8 is located in the North Titusville Community a neighborhood adjacent to Downtown Birmingham Alabama. The school opened in 1909 and was rebuilt in 2009. In the 2017-2018 school year, Washington K-8 served 546 students. Washington K-8 has a strong sense of community, and the school has created an exceptional culture of self-motivation and pride in its student body. Washington K-8 has a high level of parent outreach.

COMMUNITY BACKGROUND

As stated in the Titusville Community Framework Plan, Titusville has been a prominent African-American community since the early days of Birmingham. Founded by freed slaves following the Civil War, Titusville established itself as a center of wholesaling and manufacturing, and featured one of the first steel blast furnaces, Alice Furnace, in the region. This growth led to the development of the first airport in Birmingham, located on the current Loveman Village development, and helped turn Memorial Park into the Negro League's Birmingham Black Barons training facility, which saw the likes of Satchel Paige and Willie Mays on its ballfields.

Known as South Elyton until the 1970s, Titusville was the home of many important local leaders, including renowned architect Wallace Rayfield, and was the childhood home of former U.S. Secretary of State Condoleezza Rice. The community played a significant role in the Birmingham Civil Rights Movement, lobbying for equitable community resources and equal opportunity for all races.

Today, Titusville is entering an era of significant change. Elderly populations, many of whom have lived in Titusville for decades, will in the near future give way to an unknown market. Titusville's prime central location should prove invaluable as the community moves forward. With aging infrastructure, however significant investment will be necessary both within the community and throughout the City, if Titusville is once again to thrive.

GOALS OF THE PLAN

The goal of the Washington K-8 Plan is to provide recommendations for strategies, programs, and projects that improve students' ability to walk safely to school and to create such a community environment that other students are encouraged to do so. The simple philosophy of school travel plans can be stated as "where it is not safe for

children to walk to school, make it safe." The Plan actively promotes the six "E's" of a successful SRTS program: engineering, education, enforcement, encouragement, evaluation, and equity. This Plan discusses equity in the context of students walking and biking to school. These categories provide the framework for action items recommended in the Plan. The Plan should be adopted by the school, the district, and the City to ensure that priorities are aligned and various entities are working together toward the common goal of more students walking or biking to school.

The Washington K-8 Plan has identified measures aimed at improving and encouraging walking and biking to school. These measures will take a variety of forms, including infrastructure projects on the school campus and the surrounding streets and programs and policies that encourage or support walking and biking to and from school. The Plan provides an implementable action plan with responsible parties that will provide the school, district, and City with a series of targeted projects and programs to carry out in order to encourage more students and parents to engage in active modes of transportation to get to and from school.

ABOUT OUR EFFORT

Safe Routes to School (SRTS) is a national and international movement to create safe, convenient, and fun opportunities for children to bicycle and walk to and from schools. It includes parents and kids, school administrators, and public health, education, engineering, and city officials. Nationally, more than 17,400 schools and 6.8 million children have benefitted from Safe Routes to School projects and programs. United Way of Central Alabama (UWCA) has partnered with the City of Birmingham and Birmingham City Schools in the past to institute SRTS programs at Birmingham schools with kindergarteners through eighth-graders.

UWCA has been working with the National Safe Routes to School Program for a number of years, hosting school-based activities such as bicycle and pedestrian education, walking school buses, bicycle rodeos, walk to school days, and providing safety supplies and signage to schools.

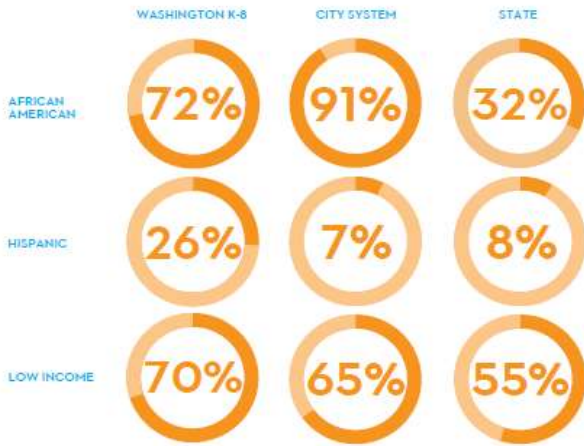
UWCA has also been an exceptional advocate for children walking and biking to school, working with the City to obtain \$800,000 in federal funds to improve bicycle and pedestrian routes in the City, coordinating work teams to obtain \$450,000 for sidewalks and other pedestrian infrastructure near schools in Pleasant Grove, Bessemer, and Chalkville, and facilitating the Safe Walking Maps.

As part of this effort, UWCA partnered with Goodwyn Mills Caywood (GMC) to provide consulting work on the plan; as GMC worked on Birmingham's Sidewalk Master Plan, this Plan and subsequent school travel plans are meant as a complement to that effort, with more targeted projects and programming aimed at improving walk- and bike-ability around schools. As schools were the top priority for walkability in the public engagement portion of the Sidewalk Master Plan, there is widespread community support for ensuring that students and neighbors are able to walk to schools.

In developing the Plan, the project team began by gathering information through discussions with stakeholders such as teachers, administrators, and parent at the school. These discussions provided valuable insights into physical and psychological barriers to students walking and biking to school, arrival and dismissal procedures, and attitudes toward students walking and biking. The team observed school arrival and dismissal to ensure that they had a thorough understanding of how students arrive at and leave school.



SCHOOL DEMOGRAPHICS



WHAT ARE THE SIX E'S OF SAFE ROUTES TO SCHOOL?

- Engineering** - Improvements to the environment such as sidewalks, crosswalks, signage, etc.
- Education** - Teaching students safe walking and biking practices such as how to cross the street, following traffic rules, signaling, and wearing a helmet. Education programs and campaigns may extend to the entire community to increase awareness of children walking and biking.
- Encouragement** - Special events such as Walk to School Day or Bike to School Day, activity challenges, walking school buses, and bike trains.
- Enforcement** - Partnering with local law enforcement to ensure that traffic laws are obeyed in the vicinity of the school.
- Evaluation** - Collecting data before and after SRTS projects to determine both the scope and success of any projects or programs.
- Equity** - Working to support safe, active, and healthy opportunities for all students, removing barriers to walking and biking.



The data was created with a representative sample. On April 30th, 2018 the team surveyed all parents who attended a parent appreciation event at the school.



**SIDEWALK NEEDS MAP**

This map highlights streets that either do not serve or underserve pedestrians within the school district's residential area. Streets that are outlined in red indicate that there is no sidewalk, and streets that are outlined in orange indicate that the existing sidewalks need improvements. This map's data was gathered for the Birmingham Sidewalk Master Plan.



**STUDENT TRAVEL**

**ARRIVAL PROCEDURE**

All students who walk or are car riders use the entrance on 2nd Street South. Students are not allowed on campus until 7:00 am. From 7:20 to 7:45 students may either participate in the free breakfast program or gather in the gymnasium. At 7:45 teachers guide students to their classrooms. School officially begins at 8:00 am.

**DISMISSAL PROCEDURE**

Car riders use the 2nd Street South doors for dismissal. The car rider line begins at the 2nd Street S driveway and continues around the school on 4th Avenue South. All cars must enter the line from 1st Street South (north bound).

The school begins calling students over the loud speaker at 2:50 pm. Younger walkers exit the 4th Avenue South doors for dismissal and are lead to the 1st Street South and 4th Avenue South intersection. Older Students exit the door closest to their classrooms facing 1st Street S. All walkers bottleneck at this intersection in an effort to ensure that the younger students do not spontaneously run across the intersection into traffic.

Many of the car riders also interact with this intersection, as a number of the parents park near the intersection and have the students walk to their car to avoid the pick-up line. Most of the students walk north on 1st Street S toward the railroad crossing.



Dismissal Procedure



## SCHOOL VISION

Our vision for Washington K-8 (and the school district):

- To be a place where students are excited about walking to school
- To be a place where students and their families feel safe walking in the neighborhood at all times
- To be a place where people value and respect their neighborhood
- To be a place where people are not afraid of threats like violence or disruption
- To be a place where students learn the skills for safe walking and biking
- To be a place where all residents have the infrastructure that they need to walk and bike safely

## CHALLENGES AND OPPORTUNITIES

As part of the planning process, a list of issues and opportunities were developed through parent outreach and surveys, staff planning sessions, and team observations.

- Dangerous intersection next to the school (1st Street South and 4th Avenue South)
  - High volumes of through traffic and overflow of car-rider line
  - Lack of stop sign or signalization
  - Lack of pedestrian safety and infrastructure
  - Lack of crossing guard
- Lack of pedestrian infrastructure at and around the railroad crossing on Center Street
- Need for district-wide pedestrian improvements
- Crime in the area

## THE PLAN

Based on the public input and team observations at Washington K-8 during drop-off and pick-up, the project team offers the following recommendations for priority actions related to encouraging students to walk and bike to school.

### COMMUNITY-BASED STRATEGIES

We have identified many activities and programs to promote walking and biking to school. These activities and programs, while grouped by "The Six Es," are dependent upon each other for their individual success.

### EDUCATION

THE EDUCATION ELEMENT CAN INCLUDE:

- Promote pedestrian / bike safety through education and awareness.
- Share updated information regarding arrival and dismissal procedures with the school community.
- Continue partnership with UWCA to promote safe walking and biking education programs like Bike Rodeos.
- Invite Birmingham Police Department to give safety presentations.
- Hold parent/volunteer training events to walk the routes with adults and students and talk about safety along the route.
- Hold Walk to School events.
- Hold Bike to School events.
- Begin a Walking School Bus.
- Collaborate with Johnson Management Group to promote idles-free zones.
- Promote Wellness throughout the District.
- Develop an incentive program for walking and biking.

### ENCOURAGEMENT

- Continue to formalize and encourage safety oriented afternoon walking and pick-up process.
- Improve communication between school officials and families.
- Establish and organize Walking School Buses and Bike Trains to support existing students and families
- Work with and host neighborhood association

and neighborhood watch organizations to stay proactive in community involvement.

- Form partnerships with neighborhood faith-based and other groups to host events such as Walking School Buses.
- Create classroom projects to learn about individual experience, and to encourage community-based learning.
- District Wellness promotion

### ENFORCEMENT

- Obtain a crossing guard for the school
- Obtain a school resource officer
- Heighten the partnership with the Birmingham Police Department.
- Foster a connection between the school and neighborhood watch.
- Recruiting parents and grandparents to act as block captains.

### EVALUATION

- Regularly complete student and parent tallies and evaluation tools
- Continue to conduct annual walk audits.
- Monitor the progress of recommended projects.

### EQUITY

- Raise awareness and change habits and attitudes that may be negative.
- Determine current attitudes and the best course to encourage walking and biking specific to Washington K-8 and its community.

### ENGINEERING

Engineering based strategies can be found in the Physical Improvement section of this plan.



**PHYSICAL IMPROVEMENTS**

The physical improvements section is an engineering approach to making pedestrian and biking safer for the students and the community through infrastructure improvements. This strategy has prioritized specific improvements based on current student travel. This element also uses the Birmingham Sidewalk Master Plan to highlight missing and substandard sidewalks throughout the Washington K-8 school district. Priorities include: upgrading sidewalks and intersections along the student's main travel routes; building new sidewalks where they are missing along student travel routes; improving pedestrian connectivity across the railroad that divides the district; creating a network of support shelters strategically placed along the student walking corridor to provide weather and emergency support.

The Plan highlights the corridor that is most traveled by Washington K-8 walkers. The North-South corridor of Center Street and 1st Street S is used by a majority of the students that walk to and from school. The corridor needs a comprehensive enhancement effort to support walking, biking, and traffic safety through a complete streets approach. Critical areas and issues are highlighted as priority projects for this corridor enhancement.

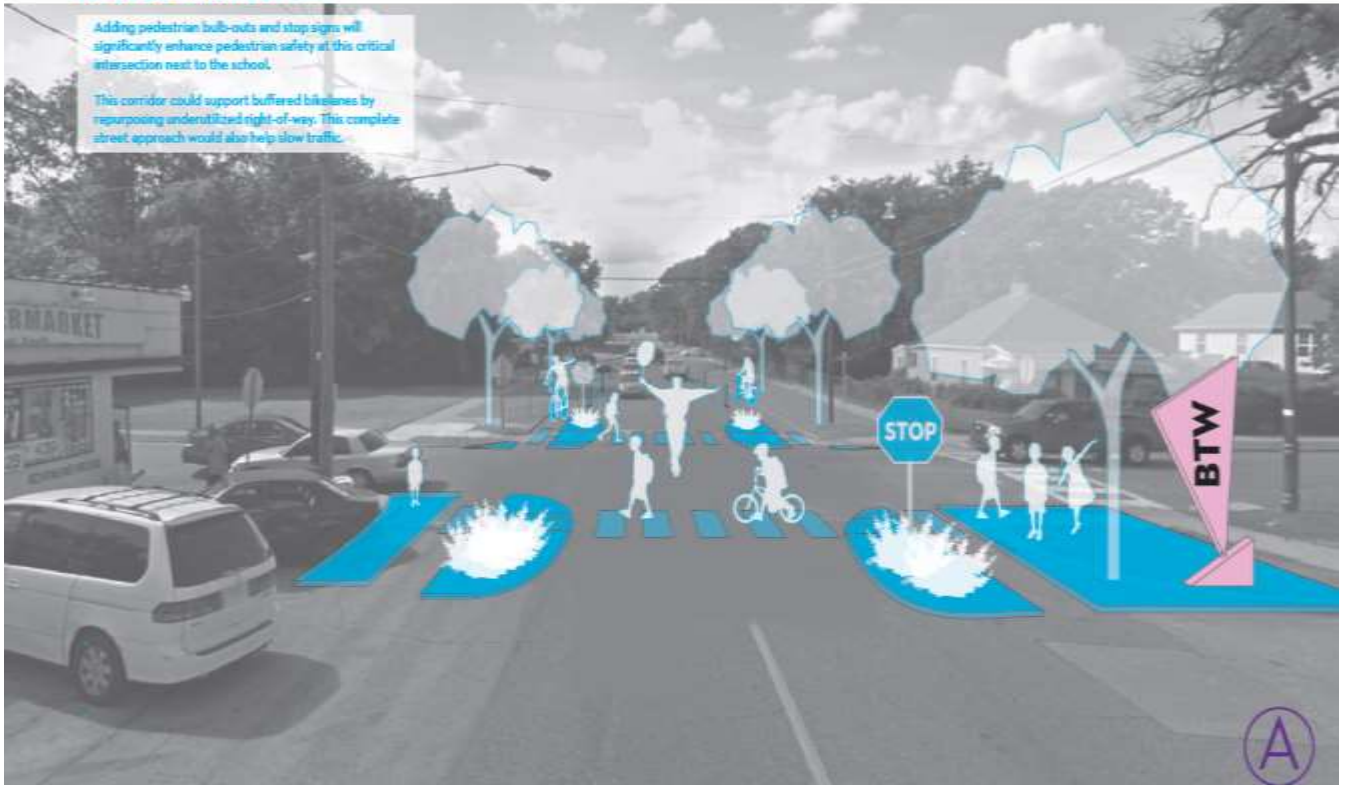


### 1ST STS & 4TH AVES EXISTING CONDITIONS



AREA VISION: Enhance pedestrian infrastructure and add stop signs at the intersection to support the school.

### 1ST STS & 4TH AVES PLAN



### 15T ST S & 15T AVE S EXISTING CONDITIONS



**AREA VISION:** Create a pedestrian pocket park to provide weather and emergency respite. This strategy can highlight a holistic approach to support walkers while providing support to existing transit stops throughout the corridor.

### CENTER ST & DIVISION CT N PLAN



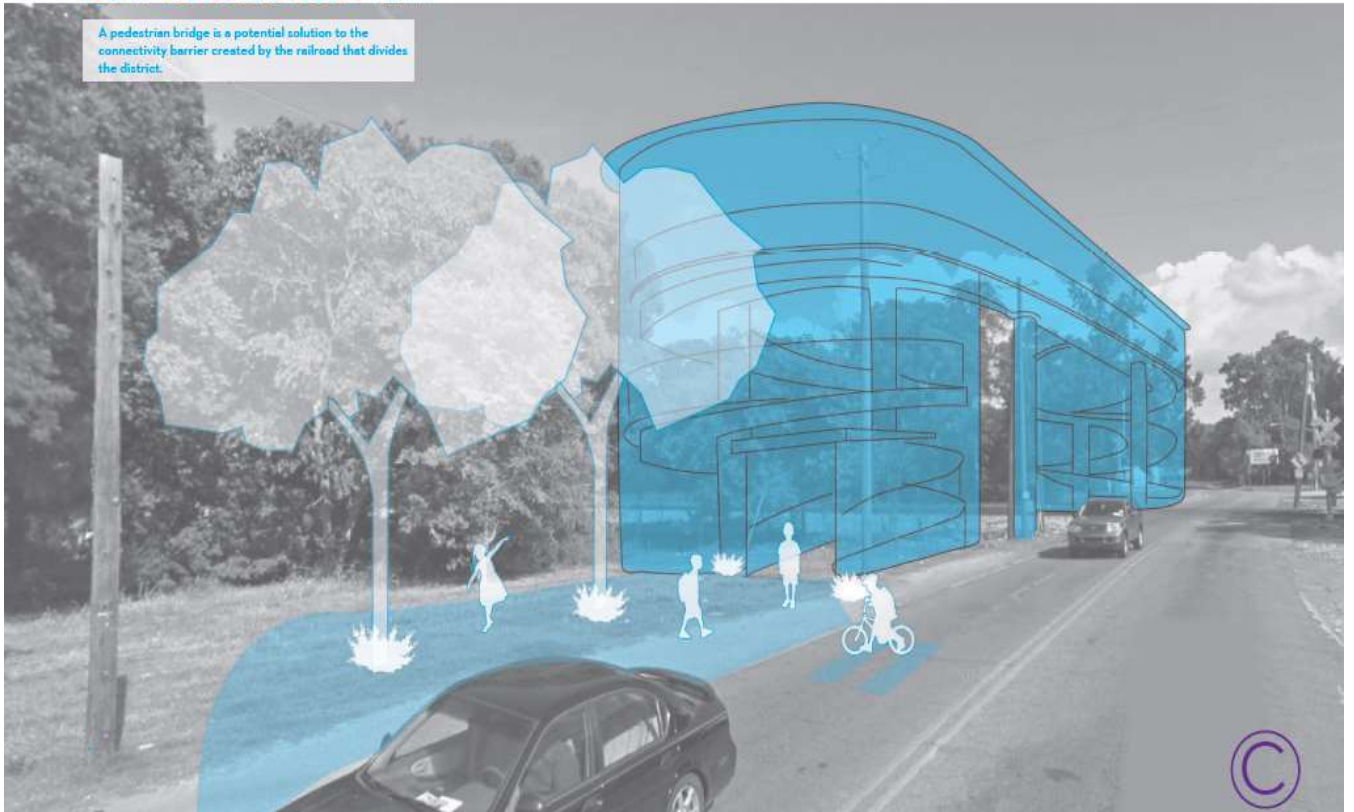
CENTER ST & RAILROAD EXISTING CONDITIONS



AREA VISION: Enhance pedestrian connectivity at this neighborhood barrier

CENTER ST & RAILROAD PLAN

A pedestrian bridge is a potential solution to the connectivity barrier created by the railroad that divides the district.





## ADDITIONAL FOCUS AREAS

### CENTER ST & DIVISION CT N

Install an existing traffic signal treatment to calm traffic at this local mobility corridor.



### CENTER ST

Enhance pedestrian infrastructure at and between Cotton Ave and Tallapoosa Ave intersections.



### 3RD AVE & CENTER ST

Enhance pedestrian infrastructure at the intersection. Consider repurposing the pedestrian island and separated turn lane on the northwest corner.

### MERGING COMMUNITY AND PHYSICAL IMPROVEMENTS



An important priority of this plan is to improve the intersection near to the school (1st Street South and 4th Avenue South) all walkers use this intersection, and this is the where the car rider line begins. As a choke point for all student walkers, car riders, and through traffic, this is a dangerous intersection. This is an issue that highlights the need for both short term and long term solutions to ensure a holistic safety approach. Currently, a staff member acts as a crossing guard in the afternoon, and an official crossing guard is appointed to this location. This staff member is in need of hand held stop signs.

1st Street South is a local collector for the neighborhood and is one of the highest traffic streets within the district. Currently the street is 35 feet wide (with a curb) a standard travel lane is 11 feet wide. With a standard travel lane for each direction of traffic heading 22 feet, there is 14 feet of unused street. This is 14 feet of unnecessary automobile area that the students should not have to cross.

The long-term goal of this plan is to create a safe intersection through a stop sign or signalization, and through a street diet to reduce the speed of traffic and reduce the distance of traffic lanes students have to cross. As a short-term solution, the plan suggests creating a crossing guard, hand-held stop signs. The first phase of this is to use traffic cones to limit the travel lanes of this intersection while increasing the buffer for students. If the pilot hand-held stop signs are successful, more permanent short-term solutions are recommended and long-term intersection improvements are in place.

The project team worked with the Safe Routes to School National Partnership to determine if pop-up demonstration projects could be an effective tool on the roads surrounding Middlebury Elementary, an area that tends to be high. Pop-up projects are temporary demonstration projects meant to show what a roadway or street could look and how it would function if permanent improvements were made. They are extremely useful tools for determining what temporary placement of the proposed engineering solutions could do for the area affected.

As part of this project and process, the National Partnership created resource guides for pop-up safe routes to school. The first sheet entitled "Options for Safe Routes to School Using Tactical Urbanism to Promote Safe Routes to School Program" outlines how pop-up projects can be used to advance SRTS projects, discuss the benefits of demonstration projects, provide examples, and share resources. This fact sheet describes how pop-up projects address several of the "Es," including engineering, encouragement, education, evaluation, and equity. The goal of most pop-up projects is to effect permanent or lasting change, and the benefits are numerous. These projects can show that more kids will walk or bike to school if it is safer to do so. They are also temporary, inexpensive, and flexible. Community leaders may be more likely to invest in permanent infrastructure with concrete evidence that improvements will be effective, evidence that can be gathered during the demonstration project.



12-MONTH ACTION PLAN

ACTIVITY	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY.	JUNE
Pedestrian Safety Day	Plan	Plan	Implement	Evaluate								
Distribute Parent Education Materials	Plan	Plan	Evaluate	Implement	Implement	Implement	Evaluate	Implement	Implement	Implement	Evaluate	
International Walk to School Day First Wednesday in October		Plan	Plan	Implement	Evaluate							
Walking School Buses	Plan	Plan	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Evaluate
Temporary Intersection Safety Improvements	Plan	Plan	Implement	Implement	Implement	Evaluate						
Crossing Guard	Plan	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Implement	Evaluate
Neighborhood Watch Program	Plan	Plan	Plan	Implement	Implement	Implement	Evaluate	Implement	Implement	Implement	Implement	Evaluate
Block/Corner Captains and Church Outreach	Plan	Plan	Plan	Implement	Implement	Implement	Evaluate	Implement	Implement	Implement	Implement	Evaluate
Classroom Tallies and Encouragement Activities	Plan	Implement	Evaluate			Plan	Implement	Evaluate				
Parent Surveys	Plan	Implement	Evaluate			Plan	Implement	Evaluate				
Annual Walking Audit	Plan	Implement	Evaluate			Plan	Implement	Evaluate				



# **Appendix G**

## **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 2017/18**

**DATE:** February 1, 2018  
**TO:** Lisa Williamson Smith, Regional Planning Commission of Greater Birmingham  
**FROM:** Valton Johnson, JMG, LLC  
**RE:** Annual Report of 2017-2018

This report speaks to the events from our efforts in public outreach around the “Clean Air” message to schools and educational groups.

JMG conducted, facilitated and attended school meetings, presented message during bike rodeos and classroom sessions at 38 schools. We reached 4,100 students during presentations and 2,354 parents/citizens during 23 car audits, while passing out over 6,000 pieces of literature. We have successfully managed to be in 117 schools across 7 school districts.

We awarded students APCA and Idle Eddy back packs, pens, pencils, windshield stickers, wristbands, fans and brochures. We shared the message on air quality and how our messaging has increased awareness and is resulting in better air quality because of the campaign. We will continue our focus sharing with students on environmental education and making parents/citizens aware by asking them to turn the key to be Idle Free.





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