

## BREATHE BETTER PROGRAM ANNUAL REPORT 2014-2015

“Breathe Better” is an anti-idling/clean air campaign. The goal of this program is to protect the health of children by reducing harmful vehicle emissions on school campuses in our State. This environmentally sustainable project is ideal for all age levels: elementary, middle and high schools. It can be easily developed, implemented and maintained on any school campus, public or private. It is a voluntary initiative and there is zero cost for schools to participate.

### Data Summary

For the 2014-2015 school year, 42 South Carolina schools elected to participate in the Breathe Better (B2) Anti-Idling Campaign. Of those, 26 schools successfully completed the Silver, Gold or Platinum level requirements, which include the installation of anti-idling signs, the adoption of anti-idling policies, the submission of initial and final data for cars and (where applicable) buses, and additional air quality activities. The data collected from these schools is summarized below:

Schools Reporting	INITIAL COUNT – CARS			FINAL COUNT – CARS			
	Total Cars	Cars Idling	Percentage of Cars Idling	Total Cars	Cars Idling	Percentage of Cars Idling	Adjusted Cars Idling*
26	1,469	627	<b>42.7%</b>	1,445	346	<b>23.9%</b>	<b>352</b>

FINAL CAR RESULTS	
Estimated Cars that Ceased Idling	Change in the Percentage of Cars Idling
281	<b>-43.9%</b>

Schools Reporting	INITIAL COUNT – BUSES			FINAL COUNT – BUSES			
	Total Buses	Buses Idling	Percentage of Buses Idling	Total Buses	Buses Idling	Percentage of Buses Idling	Adjusted Number of Buses Idling*
24	158	49	<b>31.0%</b>	181	37	<b>20.4%</b>	<b>32</b>

FINAL BUS RESULTS	
Estimated Buses that Ceased Idling	Change in the Percentage of Buses Idling
17	<b>-34.1%</b>

\*“The adjusted number idling” takes into account the difference in the initial and final number of total vehicles counted.

## BREATHE BETTER PROGRAM ANNUAL REPORT 2014-2015

### Students and Others reached by the B2 Campaign, by School

**Table 1: Enrollment at B2 Schools Submitting Initial and Final Counts**

- 16,375 students enrolled
- 1,469 parents and guardians impacted
- 181 bus drivers impacted

#### Enrollment at B2 Schools Submitting Initial and Final Counts

Region	Participating Schools by County	Students Enrolled	Total # of Students
<b>Central Midlands</b>	<b>Lexington County</b>		
	Deerfield Elementary	470	
	H.E Corley Elementary	482	
	<b>Richland County</b>		
	A.C. Moore Elementary	384	
	Longleaf Middle	664	
	Summit Parkway Middle	1,189	
	<b>York County</b>		
	Ebinport Elementary	623	
Doby's Bridge Elementary	481		
Orchard Park Elementary	785		
			<b>5,087</b>
<b>Pee Dee</b>	<b>Horry County</b>		
	Burgess Elementary	750	
	Ocean Bay Middle	1,161	
	Seaside Elementary	644	
			<b>2,555</b>
<b>Upstate</b>	<b>Anderson County</b>		
	Hunts Meadow Elementary	428	
	Wren Elementary	542	
	<b>Greenville County</b>		
	Buena Vista Elementary	835	
	Camperdown Academy	114	
	Christ Church Episcopal School	1,128	
	Dunbar Child Development Center	200	
	Oakview Elementary	969	
	Taylors Elementary	780	
	<b>Oconee County</b>		
	Blue Ridge Elementary	590	
	<b>Pickens County</b>		
	Central Elementary	327	
	Dacusville Middle	349	
	Daniel High	1,101	
Holly Springs Elementary	197		
Liberty Middle	500		
Pickens Middle	682		
			<b>8,742</b>
<b>Total Impacted</b>			<b>16,375</b>

## BREATHE BETTER PROGRAM ANNUAL REPORT 2014-2015

Schools participating at the Bronze levels agreed to install anti-idling signs, adopt anti-idling policies, and complete an additional air quality activity. Bronze level schools and other schools submitting less than two sets of data are listed in the table below.

**Table 2: Enrollment at Bronze level B2 Schools and Other Schools with less than Two Counts Submitted**

- **10,747 students enrolled**
- **Parents and guardians from seven Bronze level schools impacted, in addition to 429 parents and guardians from schools where an initial count only was completed**
- **Bus drivers from seven Bronze level schools impacted, in addition to 50 bus drivers from schools where an initial count only was completed**

**Enrollment at Bronze Level B2 Schools and Other Schools with Less than Two Counts Submitted**

Region	Participating Schools by County	Students	Total # of Students
<b>Central Midlands</b>	<b>Lexington County</b>		
	Dutch Fork Elementary	504	
	Harbison West Elementary	512	
	<b>Richland County</b>		
	Brockman Elementary	262	
	North Springs Elementary	735	
	Westwood High	1,345	
<b>York County</b>			
Springfield Elementary	585		
Sugar Creek Elementary	705		<b>4,648</b>
<b>Lowcountry</b>	<b>Charleston County</b>		
	Lowcountry Leadership Charter School	400	<b>400</b>
<b>Pee Dee</b>	<b>Horry County</b>		
	Williams Middle	692	<b>692</b>
<b>Upstate</b>	<b>Greenville</b>		
	A.J. Whittenburg Elementary	497	
	Duncan Chapel Elementary	680	
	Fountain Inn Elementary	725	
	Hillcrest Middle	1,001	
	Stone Academy	609	
	West Oak High	965	
	<b>Pickens County</b>		
Chastain Road Elementary	530		<b>5,007</b>
<b>TOTAL STUDENTS</b>			<b>10,747</b>

### **Outcome #1: Audience Reached**

During the 2014-2015 school year, the Breathe Better Campaign involved approximately 27,122 students. At schools where at least one count was completed, 2,129 parents and bus drivers were impacted; many additional drivers were impacted at the seven Bronze level schools where no counts were done.

## BREATHE BETTER PROGRAM ANNUAL REPORT 2014-2015

### **Outcome #2: Behavior Change Observed:**

Of the 26 schools that submitted initial and final counts, 42.7% of car drivers were idling while waiting in the car line at the initial count. At the final count the percentage of cars idling had decreased to 23.9%, a 43.9% reduction. Of bus drivers, 31.0% were idling at the initial count and 20.4% were idling at the final count, a 34.1% reduction.

Of the schools submitting data in the 2014-2015 school year, eight were participating for the first time, and 18 had participated in B2 the previous school year (2013-2014). At the initial count, a higher percentage of car drivers from schools repeating the program were idling relative to car drivers at new B2 schools who had not yet been exposed to the B2 anti-idling message (44.8% vs. 35.9%). Car drivers at the new B2 schools also outperformed the continuing schools at the final count (20.6% idling, vs. 24.8% for car drivers at continuing schools).

Bus drivers from continuing schools appeared to retain the anti-idling message over the summer better than car drivers; 35.9% of buses at the new B2 schools were found idling during the initial count, while just 27.7% of buses at continuing schools were idling. Of all categories of drivers, bus drivers at continuing schools had the lowest idling rates at the final count, 18.8%.

Overall idling rates for both new and continuing schools dropped substantially from the initial count to the final count. This demonstrates the benefits of continuing with B2 data collection, as well as the anti-idling message, after the initial year of participation.

A comparison of initial to final counts for the continuing school demonstrates the benefits of continuing with B2 data collection as well as the anti-idling message.

**Note: This data is self-reported and may contain some inconsistencies, some of which are related to weather. In addition, the data sets are small. Despite these factors, the overall trend has been towards positive behavioral change.**

### **Outcome #3: Emissions Reductions Estimated**

Emissions reductions are estimated for the following pollutants: carbon dioxide (CO<sub>2</sub>), volatile organic compounds (VOCs), carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>) and particulate matter (PM). Proportionate quantities of priority and toxic chemicals are also reduced.

Due to the varying circumstances at these schools and several confounding factors (ex. effect of weather on drivers' behavior), the following assumptions are necessary to estimate quantitative emissions reductions:

- All participating drivers avoided idling on all 180 days of the 2014-2015 school year (participation started at different times of the year and may have varied at times). Each driver reduced daily idling time by 15 minutes on average (based on anecdotal observations from participating schools).
- School buses consume fuel at 0.5 gallons/hour while idling (<http://www.epa.gov/cleanschoolbus/antiidling.htm>). Personal vehicles consume an average of 0.375 gallons/hour at idle (<https://www.fueleconomy.gov/feg/driveHabits.jsp>).

# BREATHE BETTER PROGRAM ANNUAL REPORT 2014-2015

## ***Idle Reduction and Fuel Savings***

Assuming that **292 vehicles** (**275** personal vehicles and **17** school buses) reduced their daily idling time by 15 minutes/day for all 180 days of the 2014-2015 school year, each participating vehicle, on average, avoided 45 hours of idling. The school buses collectively reduced **765 hours of idling**, and the personal vehicles collectively reduced **12,375 hours of idling**. Each bus saved 22.5 gallons of fuel and personal vehicles saved on average 16.9 gallons of fuel. Collectively, the school buses **saved 383 gallons of diesel**, and the personal vehicles **saved 4,640 gallons of gasoline**.

## ***CO<sub>2</sub> Emission Reductions***

Diesel fuel emits **22.4 pounds CO<sub>2</sub>/gallon** consumed, and gasoline emits **19.6 pounds CO<sub>2</sub>/gallon** consumed (<http://www.eia.gov/tools/faqs/faq.cfm?id=307&t=11>). Therefore, the **school buses reduced 4.3 tons** of CO<sub>2</sub>, and the **personal vehicles reduced 45.5 tons** of CO<sub>2</sub>.

## ***Criteria Pollutant Emission Reductions***

- **1 gram= 0.0022 pounds**
- Idling school buses emit an estimated: 4.968 g/hr VOCs, 43.505 g/hr NO<sub>x</sub>, 25.630 g/hr CO and 1.523 g/hr PM
  - **8.4** pounds VOCs reduced
  - **73.2** pounds NO<sub>x</sub> reduced
  - **43.1** pounds CO reduced
  - **2.6** pounds PM reduced
- Idling personal vehicles (cars and light trucks) emit an estimated: 3.309 g/hr VOCs, 3.768 g/hr NO<sub>x</sub>, and 71.915 g/hr CO.
  - **90.1** pounds VOCs reduced
  - **102.6** pounds NO<sub>x</sub> reduced
  - **1,957.9** pounds CO reduced

## ***Emissions Reduction Totals***

Collectively, all vehicles that actively participated in Breathe Better by reducing idling time during the 2014-2015 school year achieved the following estimated emissions reductions:

- **49.8** tons CO<sub>2</sub>
- **98.5** pounds of VOCs\*
- **175.9** pounds of NO<sub>x</sub>\*
- **2,001.0** pounds CO
- **2.6** pounds of PM\*\*

\* Ground-level ozone precursors

\*\* Bus emissions only