



## 2016 Missouri Clean Diesel Program

Through the 2016 Missouri Clean Diesel Program, six school districts in Missouri replaced old school buses with new cleaner-burning models. Four districts bought two buses; two districts, one bus. For each replacement, districts received about \$17,000, or 25 percent of the cost of a new bus.

The 2016 program followed on the heels of similar efforts to reduce concentrations of dangerous pollutants in diesel emissions. The Missouri Department of Natural Resources received an EPA grant in 2016 to fund efforts to reduce diesel emissions, and the department's Air Pollution Control Program solicited applicants from owners and operators of school buses throughout Missouri.



*Students wave from one of the two new buses in the Plato R-V School District.*

The air program held a lottery drawing to select the districts:

- Central R-III School District, Park Hills in southeastern Missouri — one bus
- East Carter R-II School District, Ellsinore in southern Missouri — two buses
- Gasconade County R-II School District, Owensville, in east-central Missouri — one bus



*The department photographed destruction of all of the old buses. The photo at left shows disabling of one of Sullivan School District's old buses. Disabling helps ensure that the project reduces diesel emissions and improves air quality. The Sullivan School District received funds to upgrade its fleet not only in 2016 but also in 2015. The department drew names randomly both years.*

- Logan-Rogersville School District R-VIII, Rogersville, southwestern Missouri — two buses
- Plato R-V School District, Plato, south-central Missouri — two buses
- Sullivan School District, Sullivan, eastern Missouri — two buses



*Using a bus scheduled for replacement, first responders in Owensville learned how to create an exit and entrance and how to extricate passengers in case of a rollover. (Photos courtesy of the Gasconade County R-II School District)*

The air program is committed to reducing diesel emissions, which contain four primary pollutants: carbon monoxide (CO); nitrogen oxides (NOx); particulate matter (PM); and hydrocarbons (HC), a type of volatile organic compound. Bus depots and school parking lots have disproportionately high concentrations of air pollutants from diesel emissions, so reducing these emissions is vital to the air program's mission of protecting public health.

*The Logan-Rogersville R-VIII school districts used the 2016 Clean Diesel Program to help purchase two buses.*



Hydrocarbons and oxides of nitrogen react in the presence of sunlight and heat to form ground-level ozone, the pollutant of most concern statewide in Missouri. Ground-level ozone causes and aggravates respiratory diseases, such as asthma. Missouri currently has several areas that violate or come close to violating EPA's 2015 standard for ozone of 70 parts per billion

Carbon monoxide is an odorless and colorless gas that inhibits the body's ability to breathe and impairs various organs. It can slow reflexes, cause confusion and decrease concentration.



Bus demolition in the Central R-III School District occurred in February 2017.

Particulate matter consists of soot, dust, ash and other particle pollution. If small enough, particulate matter can penetrate people's lungs past their natural defenses and lead to lung and respiratory diseases, including lung cancer.

Using the [EPA Diesel Emissions Quantifier](#), the air program estimated the annual and lifetime emission reductions from the 10 school buses replaced through the 2016 Missouri Clean Diesel Program. See the table, below.

<b>2016 Missouri Clean Diesel Program Reductions of Pollutants from Diesel Emissions</b>				
	<b>Nitrogen Oxides (NOx)</b>	<b>Fine Particulate Matter (PM<sub>2.5</sub>)</b>	<b>Hydrocarbons (HC)</b>	<b>Carbon Monoxide (CO)</b>
<b>Annual Reductions (tons/year)</b>	1.1720	0.0720	0.1810	0.3660
<b>Lifetime Reductions (tons)</b>	3.4820	0.2120	0.5490	1.1190

In order to guarantee that the program helped provide cleaner air for school children, faculty and communities, the school districts had to disable their buses to prevent future usage. Air program staff visited the school districts to document the disabling.



Out with the old and in with the new in the East Carter County R-II School District.



The bus scheduled for replacement in the Gasconade County R-2 School District at Owensville served as a training tool for firefighters, ambulance personnel and bus drivers. According to the school district, the chief of the Owensville Volunteer Fire Department – who is also a substitute bus driver – based the training on a course he already had taken. Participants learned what to do in case of a rollover accident. How would you create a new entrance and exit? How would you demobilize and extricate injured passengers as smoothly as possible?