



Case Study:

Independence School District Reduces Emissions, Cuts Costs with Propane Autogas School Buses

District:	Independence School District
Industry:	Education
Location:	Independence, Missouri
Vehicles:	Blue Bird Vision Propane school buses (33)
Fueling:	On-site propane autogas station

By the Numbers

- 33 propane school buses
- 10,000 to 12,000 miles traveled per bus per year
- 62 to 70% reduction in per gallon fuel costs, resulting in a \$2,000 per bus savings each year
- 10% reduction in maintenance costs

Challenge

Independence School District aimed to upgrade its aging diesel bus fleet to environmentally friendly, alternatively fueled school buses. The decision was based on the health benefits associated with reducing emissions, alongside the need for a cost-effective and seamless transition.

Result

Although diesel prices were low in 2020, the district decided the long-term benefits of purchasing propane buses and installing propane fueling infrastructure won out, aiding the community's air quality and the district's transportation costs. In the years since, it has steadily added more propane buses to its fleet.

About Independence School District

With 30 buildings and approximately 14,000 students, Independence School District runs about 100 routes that transport 8,000 students daily, including special needs and early childhood. The district covers the city of Independence as well as a portion of East Kansas City. Its school bus fleet of 130 buses includes 33 propane buses.

District officials started looking at propane autogas and alternative fuels for health and environmental benefits thanks to events held by Kansas City Regional Clean Cities and nearby school districts. “I started attending alternative fuel-related events in 2013,” said Dr. Lance Stout, deputy superintendent of operations. “I’d attend a few each year and had a couple of school districts nearby that were going down the CNG route. So, my interest continued to build.”

Migrating to a Cleaner Fuel

Rather than continuing to invest in diesel buses, leaders at Independence School District decided to move toward adopting an alternative fuel. “Both cost and emissions certainly played a role in our looking at propane,” said Daryl Huddleston, director of transportation. “Although, at the time, the price of diesel was pretty low, clean energy was intriguing and we thought it was a good idea to look at it for the community and district as well.”

The district decided on propane autogas — a nontoxic, non-carcinogenic and non-corrosive fuel, classified as a non-contaminant by the Environmental Protection Agency. It doesn’t emit soot or have strong-smelling fumes, and it reduces harmful nitrogen oxide emissions by up to 96% compared with diesel.

Affordable infrastructure cost was also a key to the adoption of propane. “When we decided to transition to some propane buses, the low infrastructure costs really helped make that decision. We did not have to retrofit the shop like you would with CNG,” said Huddleston.

Local propane company Ferrellgas built the fueling infrastructure and provides the fuel. The district now has one station with two fuel pumps and an 18,000-gallon tank at its transportation facility. The buses are fueled every other day.

Affecting Change in Kansas City

Why did Independence School District choose an environmentally friendly fuel when replacing its diesel buses? “It wasn’t a mandate, but it was a direction we decided we wanted to go in, and cleaner fuel makes a difference,” said Dr. Stout.

The first round of new propane buses from Central States Bus Sales, which arrived in 2020, replaced diesel buses that were 15 to 18 years old. The district received funding to purchase the propane buses including a [\\$20,000 rebate](#) from the Missouri Propane Education & Research Council and a grant from the charitable nonprofit organization Leonardo Academy. Although the cost of a propane bus is only incrementally more than a diesel bus, many local, state and federal funding programs are available to help offset the cost of propane school buses and infrastructure. This includes the Environmental Protection Agency’s [Clean School Bus Program](#), the Volkswagen Environmental Mitigation Trust, incentives from propane suppliers and [federal tax credits](#).

Immediate Benefits

Closing out the first year operating propane buses, district leaders repeatedly heard about the buses’ quieter operation and the cleaner air around them. The economics also looked good with a 70% savings in per gallon fuel costs in 2021. Propane autogas typically costs 50% less than diesel and 40% less than gasoline.

The current cost of diesel is \$2.91 per gallon, and the district pays \$1.11 per gallon of propane, according to Huddleston. Additionally, the district receives a per gallon tax credit of \$0.37 via the [alternative fuel excise tax credit](#). The district estimates a \$2,000 savings in fuel costs per bus each year, leaving more dollars for school, not fuel.

Jeff Putnam, fleet supervisor, says he and his staff have already noticed positive differences. “Besides propane autogas being less expensive, the time it takes to fuel is about the same timeframe as diesel buses,” he said. “I love how clean the propane buses are, too.”

ROUSH CleanTech, the propane fuel system manufacturer for the district’s buses, provided an onsite training session for the district’s technicians. Unlike diesel, propane systems don’t require a specialized technician and standard diagnostic equipment can be used to service propane buses.

“The technicians say the buses have a very straightforward system due to the lack of after-treatment and fuel injection systems and exhaust components that the diesels have,” Putnam said. “Working on the buses is so much cleaner due to the negligible emissions.”

With propane school buses, complex and costly after-treatment systems aren’t required, as is the case with diesel buses. The district’s propane vehicles eliminate components like diesel particulate filters, EGR coolers and the array of SCR parts, along with the downtime diesel failures can lead to. As a result, the district estimates a 10% reduction in preventative maintenance costs.

Missouri students, bus drivers and personnel who ride on the propane school buses have significantly reduced exposure to harmful nitrogen oxides, carbon monoxide, soot and particulate matter. In fact, one diesel school bus certified at the current Environmental Protection Agency’s emissions standard produces more nitrogen oxide than 10 ultra-low NOx propane buses. One diesel bus manufactured before 2007 emits more NOx than 100 ultra-low NOx propane buses.

Driving the Change

The district’s drivers say the performance is similar to diesel models, and their response has been extremely positive. “Our drivers mention the noise level being lower, and not having exhaust fumes has been significant as well,” Huddleston said. “They like the style and comfort level of the propane bus. They also appreciate the quieter idle sound. Drivers even say these buses warm up more quickly. And the only training the drivers needed was that the starting mechanisms are a bit different.”

Propane buses are known for being easy and reliable to operate. The district’s buses that are equipped with ROUSH CleanTech’s propane fuel systems maintain the same horsepower, torque and towing capacity as their diesel and gasoline counterparts. They also offer unaided cold-weather starts to -40°F and have a range of up to 400 miles on a single fueling.

“There haven’t been any real challenges to adopting the propane buses,” said Putnam. “However, I do recommend that fleets considering propane autogas invest in onsite fueling to increase efficiency.”

Future Plans

Independence School District will continue to replace diesel buses with propane models. “We hope to add 10 propane school buses per year over the next five to six years,” Huddleston said.

And what about the students and their families? “What the parents notice is the lack of emissions, and as we continue to go forward we’ll see some cost reductions that will be funneled back into the classroom, too,” Huddleston said.

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About Independence School District: The Independence School District ensures that each learner achieves the skills and self-confidence to be successful in an ever-changing world. The district envisions a community united to improve the quality of life through education. Learn more at idschools.org.

About MOPERC: The Missouri Propane Education & Research Council is a not-for-profit organization authorized by the Missouri Legislature. Dedicated to propane education and public awareness, MOPERC provides industry training, consumer safety, appliance rebates and market development programs. The council is composed of 15 volunteer directors and administered by an executive staff. Visit PropaneMissouri.com.

(Case study completed 2024)