



Case Study:

Liberty Public Schools Earns Fleet Excellence Award with Propane School Buses

District:	Liberty Public Schools
Industry:	Education
Location:	Liberty, Missouri
Vehicles:	(18) Blue Bird Vision Propane school buses; (4) Blue Bird propane school buses on order
Fueling:	On-site propane autogas station

By the Numbers

- 18 propane school buses
- Approximately 12,500 miles traveled per bus per year
- 64% reduction in per-gallon fuel costs
- \$56,562 in fuel savings in year one of adoption

Challenge

With a commitment to excellence and longevity of assets, Liberty Public Schools sought to replace aging, costly and high-maintenance diesel school buses with a fleet that would be friendly to the surrounding environment, the district budget and the maintenance staff.

Result

Two years after adopting propane school buses, the district has enjoyed the reliability, environmental responsibility and cost savings of the buses, and continues to add new propane buses to its fleet.

District and Fleet Background

[Liberty Public Schools](#) is a 17-campus school district outside Kansas City, Missouri, and encompasses 85 square miles. The district runs 143 bus routes for 4,200 students daily, requiring the use of 88 school buses. In 2020, the district replaced 10 outdated diesel buses with propane buses, and has steadily added propane school buses year-over-year.

Migrating to a Cleaner Fuel

When more than a dozen of the district's diesel buses were approaching the end of their lifecycle, Jeff Baird, director of transportation for Liberty Public Schools from 2017 to 2024, began researching replacement options. High on the list of qualifiers were cleaner-burning fuel, low maintenance costs and low fuel costs. During their extensive research, Baird and his team learned that propane autogas engine

technology is so advanced that harmful emissions are near zero, which is why it's the most widely used alternative fuel for school buses. Propane school buses virtually eliminate particulate matter (black smoke) without adding maintenance burdens and extra costs to the fleet like diesel does.

In 2020, Liberty Public Schools purchased 10 Blue Bird propane buses from Central States Bus Sales. The district was able to equip the school buses with child safety seats in the first 10 seats so they are used not only for regular routes, but for special needs routes and field trips, too.

Now, propane school buses are a mainstay for the transportation department. "We use propane buses for everything possible — special activities, sports trips, special needs fleet and daily routes," said Brandon Thrasher, assistant transportation director for Liberty Public Schools.

Invested in the Environment and Students

The propane school buses benefit not only Liberty Public Schools students and drivers, but the surrounding community since they significantly cut harmful emissions. Propane autogas is a nontoxic, non-carcinogenic and non-corrosive fuel. "Our leadership takes a responsible look toward emission control and is invested in lowering the carbon footprint created by district vehicles," Baird said.

According to the U.S. Environmental Protection Agency, propane emits fewer greenhouse gas emissions than gasoline, diesel and electricity in a variety of end-use applications. In fact, 24 propane buses emit less nitrogen oxides than one diesel school bus manufactured between 2007 and 2010.

The health benefits extend beyond the environment. A [Georgia State study](#) correlated increased academic performance when children were exposed to lower levels of harmful school bus emissions. Student test scores improved in both math and English when alternative fuels like propane autogas replaced diesel.

Budget Benefits

The district tracks pricing for diesel, gasoline and propane autogas because it currently operates buses that use all three fuels, citing a preference for fleet diversity. The district currently pays \$3.27 per gallon for diesel and \$1.18 for propane. "In the current economy, the savings over diesel has been considerable," Baird said. "In the first six months of this school year, we are roughly \$10,000 under budget for projected fuel costs."

To measure budgetary success, Liberty Public Schools monitors the following metrics: gas mileage, reliability and repair costs. The initial propane bus fleet drove 125,000 miles in the first year, with a total fuel cost of \$24,688. That same year, the district spent \$81,250 on fuel for 10 diesel buses. The fuel savings when comparing diesel to propane in the first year was \$56,562.

One of the reasons propane is inexpensive when compared to other fuels is that propane is a domestic fuel. More than 90% of the U.S. propane supply is processed in the nation, with an additional 7% from Canada. In addition, Missouri has access to dependable propane supplies through six terminals statewide.

"Road reliability is important to the district," Baird said. "If a diesel bus needs an engine replacement, it costs \$30,000. If a propane engine needs replacement, it costs about \$8,500. This fact alone is expected to increase the average lifespan of a propane bus 18,000 miles over diesel — about a year and a half."

Regarding repair cost savings, Baird estimates that the district will save approximately \$23,000 on exhaust maintenance compared to its diesel buses since exhaust maintenance is not part of a propane bus drive train. He added that “all savings go back to the classroom. The first year of fuel savings alone was enough to support one classroom teacher.”

Fleet Excellence

Propane autogas makes sense for Liberty Public Schools’ commitment to maintenance integrity and asset longevity. The district's propane school buses will lower total cost of ownership by saving on maintenance-related expenses and manpower. “We operate a fleet with the philosophy that we have good maintenance and solid preventative maintenance,” Baird said.

With the addition of propane buses, the shop earned the fleet excellence award given by the state highway patrol to districts that are excellent at maintaining their fleet.

To meet emission standards, today’s diesel buses require expensive equipment and high-maintenance systems, which aren’t required on propane buses. Diesel buses require components that need to be maintained, including diesel particulate filters, manual regeneration and diesel exhaust fluid, and other complex after-treatment devices. While clean diesel can be cleaner than pre-2007 school bus models by employing those complex and costly after-treatments, propane is cleaner by its very molecular, low carbon composition. “The service parts for a diesel engine are so much higher,” Thrasher said. “The maintenance on our propane buses is minimal.”

The only challenge that Thrasher has experienced first-hand is a fuel rail that had to be sent back to the bus dealer. “Other than that, they have been great. Case in point: today, temps dropped to negative 10 degrees, which wreaked havoc on our diesel fleet but our propane fleet responded perfectly,” he said.

Liberty Public Schools school bus technicians report a clean, safe and efficient work environment because propane vehicle maintenance is faster, easier and less costly compared to vehicles that run on diesel or gasoline. For its propane buses, the district performs oil changes every six months or 5,000 miles. The Blue Bird Vision Propane Type C school bus takes seven quarts of oil; diesel engines take over 30 quarts of oil. A diesel oil filter itself costs two to three times more than a gasoline or propane oil filter.

A Network of Support

Baird and Thrasher appreciate the partnership network for propane school bus adoption. District leadership is supportive, and district staff work closely with Central States Bus Sales and propane fuel system manufacturer ROUSH CleanTech. “We also have a network to work with other districts in the state that operate propane buses, like Grain Valley School District,” Thrasher said.

“Our district did an excellent job with the initial steps to operating cleaner school buses – especially with research and organizing,” he added. “I strongly recommend school districts work through the infrastructure and service side before receiving the new technology.”

Thrasher also recommends that schools hire and train mechanics that understand the propane system. “The capability with propane buses is worth it but there are some growing pains and differences such as maintenance and fueling,” Thrasher said.

“Our experience with ROUSH CleanTech made a big difference in our decision to purchase. They conducted initial training onsite and have a support system to guide our staff through mechanical challenges or to answer questions,” Baird said. As a result, the district’s technicians are onboard with the shift to propane school buses — enjoying the simpler powertrain and appreciating the elimination of diesel exhaust fluid.

Fueling Infrastructure and Grant Assistance

When it comes to fueling propane fleets, there are three options. Some districts choose mobile fueling where a local propane supplier fills up buses directly from a delivery truck. Others fuel at public propane stations. However, Liberty Public Schools, like most school districts, installed onsite infrastructure for the convenience and low cost — a propane fueling station costs less than any other fuel type.

The school district partnered with Ferrellgas to install a 10,000-gallon fueling station onsite directly in the bus lot. The district recently added a second pump to the onsite station. Ferrellgas applied for and received a grant for the fueling station, saving the district \$80,000 on the install.

Propane suppliers specialize in helping fleets choose the right fueling option based on the fleet size, routes, budget and facility space. Fueling has been easy to adjust to because the propane supplier provided certified safety training for all of the district’s employees. “It works very well because drivers can fuel their buses based on their schedules,” Thrasher said. He added that district staff is excited for four new propane buses to be delivered because they have larger tanks, with 93-usable gallons of propane.

To help offset the purchase cost of the buses, the Missouri Propane Education & Research Council (MOPERC) awarded \$20,000 to the school district as part of MOPERC’s [propane autogas rebate program](#). The plan offers rebates of \$2,000 per propane bus, up to 10 per district, at the time of delivery.

There are also federal funding programs available, such as the Volkswagen Environmental Mitigation Trust and Clean School Bus Program, which are beneficial to help with the cost to replace aging diesel buses. The school district can also take advantage of the [alternative fuel excise credit](#) and [alternative fuel infrastructure tax credit](#).

Driver Satisfaction

To ensure the drivers feel comfortable operating the district’s new propane buses, ROUSH CleanTech provided training, which included fueling, driving skills and tail swing. The district then monitored fuel mileage and retrained drivers to optimize vehicle performance.

The drivers also found the performance better than expected, retaining equivalent horsepower, torque and towing capacity as gas and diesel counterparts. “It took an initial adjustment period,” Baird said. “But now, the drivers like the new buses and do not want to shift back to a diesel bus.” Even with extreme weather, drivers reported that the propane buses performed just as well as other buses, including

conditions such as snow, high wind and heavy rain. And, propane buses warm up quickly and have no cold-start issues on winter mornings.

The district's bus drivers have reported a major reduction in noise levels. Buses fueled by propane autogas reduce noise levels by producing sound 11 decibels lower than diesel-fueled buses, resulting in about 50% less noise. The lower noise levels have improved clarity and communication between drivers and students, and it has helped with audio on bus monitoring systems.

Notable Success

Reflecting on what Liberty Public Schools was looking for when they replaced their outdated diesel buses — cleaner fuel, low maintenance costs and low fuel costs — the transportation team is pleased with the choice the district made to go with propane buses. "They have exceeded our expectations," said Baird.

Liberty Public Schools has such success with its propane buses that it plans to add more propane school buses each year, with projections for another 21 over the next five years. Diesel buses that have not lived out their full life cycle will be used as spares.

Increasing numbers of school districts across Missouri are recognizing that propane autogas is the right choice for their fleets because it is safe, economical and clean. And, the power, availability and reliability of domestically produced propane help Missouri school districts be part of a clean-fuel revolution.

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About Liberty Public Schools: Liberty Public Schools serves the residents of Clay County. Located northeast of Kansas City, the school district serves more than 12,300 students in preschool through 12th grade. Despite being one of the fastest-growing school districts in the state, Liberty Public Schools is family-oriented and sees its over 30,000 community residents take pride in being neighborly and maintaining a hometown spirit.

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 updated 2024)