



MOPERC
Missouri Propane Education
& Research Council



Propane-Powered Buses Revolutionize School District's Transportation Landscape

District: Grain Valley School District
Industry: Education
Location: Grain Valley, Missouri
Vehicles: (18) IC Bus propane school buses; (9) Blue Bird propane school buses
Fueling: On-site propane autogas station

By the Numbers:

- 27 propane buses (50% of the district's bus fleet)
- 49% reduction in per gallon fuel costs
- \$25,000 per bus in grant funding

Challenge

With aging diesel buses to replace and diminishing state reimbursements for transportation, a Missouri school district looked to alternative fuel options that would save money on fuel and maintenance.

Result

Grain Valley School District purchased 14 propane school buses in 2018 and saw immediate cost savings and positive feedback from its staff. The district added nine more propane school buses in the following two years, with an additional four scheduled for delivery in 2024. District leadership is now committed to converting its entire fleet to operate on propane autogas.

About Grain Valley School District

Grain Valley is a suburb of Kansas City with a population of about 15,600. The growing school district covers 40 square miles and includes all of the city of Grain Valley, plus parts of eastern Blue Springs, western Oak Grove and some areas of unincorporated Jackson County. Current student enrollment in the district is 4,500 K-12 students. The district's fleet is made up of 50 buses that transport 2,786 students to school from suburban and exurban neighborhoods via 43 routes.

Focus on Cost-Cutting

Over the years, Missouri state reimbursements for school transportation have dropped from 75% to 20% or less. School districts in the state have had to tap their own general school funds to make up the shortfall.

To help save money and create a more sustainable model for its transportation department, Grain Valley School District considered alternative fuels for its new school buses and compared compressed natural gas (CNG) and propane autogas. District representatives attended an alternative fuels workshop hosted by Kansas City Regional Clean Cities. The district considered various fuels but “the vehicle costs and fueling station costs for CNG were much higher versus propane,” said Shawn Brady, director of transportation.

In 2018, the district purchased its initial 14 propane buses to replace 2001 and 2002 model year diesel buses. Brady researched and applied for a grant from the U.S. Department of Energy to assist with the purchase costs of the buses. “On average, we have received at least \$25,000 per bus in grant funding for each of our propane buses,” Brady said.

The district also took advantage of the Missouri Propane Education & Research Council’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.

With savings from the purchase of the buses and ongoing fuel and maintenance savings, Brady said the district has been able to increase compensation for staff in the transportation department.

Preparing for Propane

To fuel the new buses, the district entered into a contract with their local propane provider, Ferrellgas. A fueling station with two 1,000-gallon tanks was built in the school district’s bus parking lot in April 2018. “It saves time not to have to travel to refuel,” Brady said.

Infrastructure costs for propane are the lowest of any fuel; alternative or conventional. For Grain Valley schools, the start-up cost for the fueling station totaled \$16,500. “We received a 45% grant from Metropolitan Energy Center for the installation of our propane fueling station,” he said. The center’s grant amounted to \$7,425. “The fueling station cost us only \$9,075 after the grant.”

Before putting the new buses on the district’s routes, drivers received training in propane bus operation. “Our bus vendor provided training on how to properly operate the buses and maximize fuel efficiency,” Brady said. Drivers report that the propane dispenser pumps are just as fast or faster than the diesel fuel pumps when it’s time to fill the tank.

The district’s technicians traveled to the bus manufacturer’s factory in Tulsa, Oklahoma, for a complimentary week-long training course on maintenance. The district didn’t need to make changes to its bus repair facility. Requirements for a propane vehicle service facility are generally the same as those for conventionally fueled vehicles.

Financial Benefits

After tapping grants for purchase assistance, each new bus cost about \$250 more than a comparable diesel bus. District officials say that the cost differential can be quickly recouped in fuel savings.

In fact, by adding propane buses to its fleet, Grain Valley School District noted savings on both fuel and maintenance. On average, propane autogas costs 50% less than diesel. As part of its negotiated contract

with Ferrellgas, Grain Valley pays \$1.41 per gallon of propane. For comparison, the district pays \$2.75 per gallon for diesel.

Each bus in the district runs about 11,000 miles per year. For the first school year the buses were in operation (2018-2019), fuel savings amounted to about \$14,500. The district also receives on average \$23,000 per year in alternative fuel tax rebates from the IRS for using propane. “The district’s increased savings year after year allows the transportation department to serve as a better steward of taxpayer money,” Brady said.

Even more savings show up for the district in the winter. Due to the chemical properties of propane autogas, the propane buses warm up faster and have no cold start issues. Unlike diesel vehicles, these buses can start up in temperatures as low as negative 40 degrees Fahrenheit. School districts report lower electric costs because the propane buses don’t rely on block heaters. “Our propane buses warmed up faster this past winter than the diesel buses,” Brady said.

Easy Maintenance, Positive Technician Feedback

Additional savings come from reduced maintenance on the buses. With propane autogas, no exhaust after-treatment or diesel emissions fluids are required to meet today’s strict emissions regulations, as is the case with diesel. Propane vehicles don’t need particulate trap systems, turbochargers and intercoolers. All these factors contribute to the overall savings of time and money. The district’s technicians like the propane buses, Brady reports, because there are fewer parts and systems to have to maintain.

According to Brady, the biggest challenge with the propane buses so far has been emptying the fuel tank in order to change the fuel pump. He said that the district needed to purchase a burn-off tool, which is a large flare connected to the bus fuel tank. It burns off any remaining fuel in the pressurized fuel tank, allowing the mechanics to change the interior fuel filters and pumps for maintenance.

Six years into adopting the propane buses, district technicians now say they prefer working on the propane school buses over the diesel models. Nationwide, technicians report a better day-to-day experience with propane autogas because the system is easier and cleaner. Maintenance staff do not have to deal with fuel leaks or spills and they don’t smell like gasoline or diesel at the end of the day.

Beyond the Bottom Line

Grain Valley’s propane buses are helping to improve the community’s air quality. Unlike diesel buses, propane vehicles emit virtually no particulate matter and substantially less nitrogen oxides (NOx). Buses fueled by propane also emit fewer greenhouse gases and total hydrocarbon emissions when compared to diesel buses. Propane’s quiet operation makes riding the bus more pleasant for passengers and safer for drivers, who are less distracted by engine noise. “We’ve benefitted from much cleaner air and much quieter buses running through neighborhoods,” Brady said.

Propane Is the Best Decision

The district’s leadership in adopting an alternative fuel earned it a 2018 Agent of Change Award from the Metropolitan Energy Center, a Kansas City nonprofit catalyst for energy efficiency, economic development and environmental vitality.

More than 50% of the current bus fleet operates on propane. The district plans to move to an all-propane fleet, with new propane buses rolling in on a regular basis. Its commitment to moving forward with an all-propane fleet speaks to the administration's belief in the benefits of this alternative fuel for their students, drivers and larger community.

"Going with propane is the best decision our district has made," Brady said. "The savings are very good. The environmental impact is an added benefit. There's no reason to not make the move into propane now."

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About Grain Valley School District: Grain Valley School District is determined to be the best model of student success, whose graduates are prepared to excel in a complex world. Our motto is: Every student, every day.

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 in 2024)