



“PROPANE ROLLS FIRST”

IN NORTHERN MINNESOTA

Discover how school bus operations at St. Louis County Schools have been made more affordable and reliable with the adoption of a propane-powered fleet.



Case Study Completed by ROUSH CleanTech November 2023

ST. LOUIS COUNTY SCHOOL DISTRICT

BACKGROUND AND CHALLENGE

With about 2,250 students spread across more than 4,000 square miles, Minnesota’s notoriously brutal winters are only one challenge faced by the St. Louis County, Minnesota School District. Cost is another, as the district – along with thousands of other school systems – faces increasing costs every year.

The Challenge

To reduce the growing school district’s operating costs by saving on fuel, repair, maintenance, and reporting requirements for its school bus fleet.



95%

of the district’s buses are propane

THE SOLUTIONS

1 Significant Cost Savings

For nearly a decade, the repairs and maintenance budget for St. Louis County Schools in Minnesota has remained unchanged — despite a growing student population and several school expansions. The district currently serves about 2,250 students. “I credit having propane buses with keeping our dollar amount low for ten years,” said Kay Cornelius, transportation director for the district.

Cornelius performed due diligence when researching alternatives to diesel buses. “I was looking for ways to save money. With grants and fuel rebates that were available, there was an incentive for us to take the leap to alternative fuel,” she said. After consulting further with United Truck Body, a local school bus dealer, and Como Oil & Propane, a propane supplier, Cornelius was set on propane.

During the research phase, Cornelius also learned that maintenance on a propane bus costs significantly less than on diesel.

2 Affordable, Scalable Infrastructure

Como Oil & Propane installed an onsite propane station to fuel the propane buses. **“We paid for the electrical for the pump, and they did the rest,”** Cornelius said.

With the onsite fueling infrastructure, the district is more insulated from fluctuating fuel prices, allowing it to better forecast its budget. “We are able to negotiate on a yearly basis the price per gallon,” said Cornelius. **The district’s current price per gallon of propane is \$1.85 compared with \$4.48 per gallon of diesel,** a 59% savings on the cost of the fuel alone. In some years, the savings have been up to 70%.



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Cleaner, Easier Operations

Tightened standards on diesel emissions forced burdensome requirements on the district. Operating on propane autogas instead of diesel removes the complexity and cost of after-treatment measures, a saving that can accelerate return on investment and cut operating costs.

“I found that we have a lot more mechanical issues with the diesels,” Cornelius said. “In my opinion, when they started upgrading the emissions, they created some very expensive issues. We’re finding that there are high-pressure oil rail issues and that the engine is burning so hot that the oil will actually take on the consistency of coffee grounds. So, we have to do oil changes at shorter intervals. Diesel emission fluid has created a whole new problem, as we’ve had to deal with dosing problems and freezing issues.”

Additionally, propane does not require diesel particulate filters, diesel exhaust fluid, exhaust gas recirculation, or other after-treatment devices. That’s more than 15 parts that aren’t needed for the school district’s propane buses. **“With propane buses, there are less items to watch for, and they are much cleaner to work on,”** Cornelius said.

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New Technology, Great Feedback

Since 2012, ROUSH CleanTech and Blue Bird have partnered to offer propane school buses, with more than 18,000 operating in over 1,000 school districts across North America. In 2021, ROUSH CleanTech began production of its Gen 5 propane autogas fuel system. The innovative propane autogas technology is integrated with Ford’s new 7.3L V8 engine. As of 2023, all school buses with ROUSH CleanTech propane engines are certified to ultra-low nitrogen oxide levels of 0.02 g/bhp-hr, making them 90% cleaner than the Environmental Protection Agency’s most stringent emission standard.

Cornelius observed that the new propane engine has more power than the diesel engine, as well as other benefits for drivers and students. **“In comparing it to a diesel, the engine is much quieter, and the clean burn of the propane is a plus for drivers because the exhaust is nearly odorless,”** she added.

When compared with gasoline or diesel vehicles, school buses that run on propane autogas emit fewer greenhouse gases and smog-producing hydrocarbons and virtually eliminate particulate emissions. In addition, St. Louis County Schools’ bus drivers report that the propane buses are much quieter, as propane buses reduce noise levels by about half compared to diesel buses. The drivers also appreciate that they don’t generate dirty diesel exhaust, improving the air quality for them and students alike. “Our drivers are totally bought in,” said Cornelius.

THE RESULTS

Actual Savings

Across the nation, hundreds of school districts have reported savings of up to \$3,700 per bus per year due to lower fuel and maintenance costs for propane buses compared to diesel. The St. Louis County school district propane buses used approximately 140,000 gallons of propane in 2023, resulting in a rebate from the alternative fuel tax credits of about \$38,000 for the district. **The district saves nearly 50% per oil change: an oil change for a diesel bus costs the district about \$400, compared to about \$200 for a propane bus.**

In addition to the bottom-line savings in the cost of maintenance and cost per mile to operate, the district has found that its Blue Bird Vision Propane school buses equipped with ROUSH CleanTech propane fuel technology have a cleaner engine compartment and fewer emission issues than its diesel models. This cleaner operation cuts the district's compliance requirements, which leads to reduced operational costs.

As the propane fleet grows, Cornelius plans to add three more fueling dispensers to its onsite infrastructure so that more buses can be fueled at once. Propane autogas fueling infrastructure costs less than any other transportation energy source, conventional or alternative.

By the Numbers



70%
savings on
fuel costs



50%
savings on each
oil change



\$38,000
in alternative
fuel tax credits

1,200 Miles of Success

In 2023, the district's robotics team attended an out-of-state competition. The team successfully traveled 1,200 miles from Babbit, Minnesota, to Peoria, Illinois, on a propane bus that was pulling an enclosed trailer.

While many school districts operating propane school buses report reserving diesel buses for long-haul field trips, Cornelius was confident that the district's propane buses could get the job done.

First, Cornelius plotted out fueling stops along the journey. There are thousands of propane autogas fueling stations in the United States, with stations in every state. The bus was fueled twice on the way to Illinois and twice on the way home to Minnesota. For upcoming field trips, Cornelius plans to negotiate with Love's Travel Stops every six months to obtain the best pricing.

Next, Cornelius ensured that the driver was sufficiently trained to operate the propane bus during the extended trip. "I had never driven a propane bus before this trip and was unsure about it all," said the driver. **"The district helped me by bringing in a seasoned propane bus driver to train me on the system. I really loved the experience of driving the propane bus. I prefer driving propane buses now."**

Propane Rolls First

The district currently runs nearly 95% of its bus fleet on propane, only using diesel buses as backup. After a decade of successful propane autogas deployment, Cornelius established the district's 'propane rolls first' protocol. "Our staff knows that, unless a propane bus is being worked on and cannot be driven for the day, the propane buses get used first," said Cornelius. "If a driver starts up a diesel bus, they need to explain why."

When it comes to the future operational and financial health of the St. Louis County Schools transportation department, Cornelius is confident that propane is the best choice.

"Planning ahead and planning well will give you success," added Cornelius.

"Propane is the right plan for us."



MORE ABOUT THESE **PARTNERS**

About St. Louis County Schools

The mission of Independent School District 2142 is to provide a high-quality education that prepares students to thrive in a changing world. The St. Louis County, Minnesota, school district serves about 2,250 students and is geographically the largest school district in the state at over 4,000 square miles.

About ROUSH CleanTech

ROUSH CleanTech, an industry leader of advanced clean transportation solutions, is a division of the global engineering company Roush Enterprises. ROUSH CleanTech develops propane autogas technology for medium-duty Ford commercial vehicles and school buses. With more than 50,000 vehicles on the road, the Livonia, Michigan-based company delivers economical, emissions-reducing options for fleets across North America. Learn more at ROUSHcleantech.com or by calling 800.59.ROUSH.

