



Case Study:

Propane Buses Bring Nevada School District Fleet to 100% Compliance with State Legislation for a Decade

District:	Washoe County School District
Industry:	Education
Location:	Reno, Nevada
Vehicles:	Blue Bird Vision propane, Type C school buses (56) Micro Bird propane, Type A school buses (13)
Fueling:	Onsite propane fueling stations (2)

Challenge

Comply with continually changing Nevada legislation requiring government fleets to operate clean, alternative fuel vehicles.

By the Numbers

- 10 years of operating propane school buses
- 69 propane school buses that run 100-200 miles per day
- 65% per gallon cost difference compared to diesel
- 20% of routes run on propane autogas

Background

Washoe County School District is the second largest school district in Nevada, spanning mountainous regions of Reno, Sparks and other unincorporated communities over 6,342 square miles. The district transports about 19,000 students on 265 bus routes to 100 schools each day. Each bus averages 100-200 miles on daily and special education routes.

A leader in clean transportation efforts, WCSD has operated alternatively fueled buses since 2000. The district initially purchased compressed natural gas buses after receiving a grant for a CNG station. WCSD then ventured into biodiesel followed by propane autogas in 2014 when government grant funds became available.

“When state legislation about alternatively field vehicles for large fleets was passed, Washoe County School District embraced alternative fuels to reduce emissions and improve air quality. Our fleet is 100% compliant,” said Jon Kelley, fleet operations manager.

Propane is a low-carbon alternative fuel that can produce significantly fewer greenhouse gas emissions than diesel, gasoline and electricity in a wide range of applications. It's classified as a clean alternative fuel by the Environmental Protection Agency.

Improving Air Quality

Nevada's Alternative Fuel Vehicle Acquisition Requirement mandated that government fleets containing 50 or more vehicles in a county with a population of 100,000 or more must acquire alternative fuel vehicles. Based on its size and demographics, WCSD was required to adhere to these requirements, which is why it began to explore fuels like propane autogas.

WCSD first integrated propane autogas by adding seven propane school buses into its fleet in 2014, with additional propane school bus purchases in subsequent years. The district now operates about one-third of its total bus fleet with 69 propane buses.

Propane is non-toxic, non-carcinogenic and American-made using abundant resources. The four major greenhouse gas categories identified and monitored by the EPA are carbon dioxide, methane, nitrous oxide and fluorinated gases. Propane is not one of them.

The district's buses emit fewer smog-producing hydrocarbons and virtually eliminate particulate matter when compared to conventional diesel. The buses also drive toxic nitrogen oxide levels down to near-zero levels and beat the federal requirements by an average of 54% across the greenhouse gas family.

The propane fuel systems on WCSD's buses are Environmental Protection Agency and California Air Resources Board certified.

Reducing Costs

The district's main objective of incorporating propane buses has been to reduce emissions and stay in compliance with Nevada law, but it has also enjoyed cost savings. Currently, WCSD pays \$4.25 per gallon for diesel and \$1.53 for propane, resulting in a 278% per gallon savings. Federal alternative fuel tax credits can drive savings even further for the district. The dramatic fuel savings have helped the transportation department continually improve preventative maintenance protocols for its fleet.

In addition to fuel cost savings, oil changes are less expensive for propane buses than for diesel. "The overall cost per mile is about 13 cents less per mile than diesel," said Scott Lee, transportation director. "The parts are also much less expensive than diesel, for the most part. It's a lot less oil and one small, single filter."

Post-2008 diesel buses require complicated emissions equipment, along with expensive maintenance parts and fluids. The district saves both time and money with propane buses because the extra maintenance products and additional staff time are not needed.

District technicians report ease of maintenance for the propane buses. The buses can be serviced with standard Blue Bird and Ford diagnostic equipment. “Many of our technicians already have experience working with Ford engines, and they find that propane engines are straightforward and easy to maintain,” said Kelley.

Driving with Efficiency

The district’s school bus drivers and students appreciate the quiet ride and the cleaner air resulting from reduced emissions. On board, the buses boast a safer ride to school because noise levels are decreased by 50% when compared to diesel counterparts, giving drivers fewer distractions.

During the winter, WCSD’s drivers aren’t concerned with cold weather start-ups. With the ROUSH CleanTech fuel system, propane remains in a liquid state until it gets to the cylinder. This has alleviated cold start issues associated with vapor technology propane systems of the past. The propane fuel system provides an unaided cold weather start to negative 40 degrees Fahrenheit.

To ensure that the propane buses are driven to their fullest potential, the drivers receive regular training. By revamping bus driver training, WCSD has increased fuel economy, miles per gallon and driver awareness. Over the years, the district held an annual driver competition for best mileage per gallon. The winner gets bragging rights — and other WCSD drivers learn the driving style that conserves the most fuel.

Fueling with Propane Autogas

Washoe County School District installed two low-cost onsite propane fueling dispensers to accommodate the current fleet capacity; one with 1,000-gallon tanks and one with 6,000-gallon tanks. Installing a propane station costs less than any other fueling station, including gasoline and diesel. Many districts choose to work with their local propane supplier to install an onsite station; however, other options include mobile fueling and offsite fueling. WCSD partners with Ferrellgas for its propane supply. “For anyone getting into propane, I suggest having your own infrastructure,” said Lee.

Each driver receives annual in-house training to ensure they’re fully aware of the safety procedures when fueling a propane bus.

A Supportive Network

To extend its networking capabilities and best practices, WCSD joined the Energy Department’s Reno-Tahoe Clean Cities program in which Kelley has been an active member on several committees. Kelley is also past vice chairman of the Rocky Mountain Fleet Management Association, Nevada Chapter. “Being an active member of both groups allowed

me to better my own processes and abilities, which directly affect my duties with WCSD and the community in a positive way on a daily basis,” he said.

In an increasingly complicated and rapidly changing transportation landscape, propane autogas provides a simple solution to the complex problems posed to school district transportation fleets. “My advice to other school districts considering propane school bus adoption? Do it,” said Kelley. Lee agreed, saying, “Now that we have been using them for 10 years, we have found that they are a viable product.”

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About Washoe County School District: The Washoe County School District is the second-largest public school district in Nevada and ranks among the top 60 school districts in the country in terms of size. Washoe County School District’s promise is to know every student by name, strength and need so they graduate prepared for the future they choose, and we will deliver on this promise in partnership with our families and community.

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.

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