



## Case Study:

### Propane Buses Bring Nevada School District Fleet to 100-Percent Compliance with State Legislation

**District:** Washoe County School District  
**Industry:** Education  
**Location:** Reno, Nevada  
**Vehicles:** 2013 – 2015 Blue Bird Propane Vision, Type C school buses (35)  
2013 Micro Bird, Type A school buses (12)  
**Fueling:** On-site propane autogas station

#### Challenge

To comply with Nevada legislation that government fleets containing 50 or more vehicles must acquire alternative fuel vehicles.

#### By the Numbers

- 1.5 million miles logged and 285,000 gallons of propane used over three years.
- \$24 average savings per oil change every 5,000 miles.
- 1.1 million pounds of carbon dioxide eliminated over the life of the Type A bus fleet compared with gasoline models.
- 59,000 fewer pounds of nitrogen oxide emissions and about 1,200 less pounds of particulate matter for the Type C bus fleet compared with conventional diesel models.
- Almost 15 percent of total bus fleet runs on propane autogas.

Washoe County School District is the second largest school district in Nevada. The district transports about 18,400 students to school each day on 257 daily bus routes. The school district's attendance area spans over 6,325 square miles, comprising 93 schools.

Since 2000, WCSD has operated alternatively fueled buses. The district initially purchased compressed natural gas buses after receiving a grant for a CNG station. WCSD then ventured into biodiesel and, more recently, propane autogas after learning about the fuel's benefits from their bus supplier, Bryson Bus Sales.

"Washoe County School District has been regulated by state legislation to use alternative fuels to reduce emissions and improve air quality," said Jon Kelley, fleet operations manager. "Our fleet is 100-percent compliant."

The bulk of WCSD's 329-bus fleet runs on biodiesel; 47 buses are powered by propane autogas; and one is fueled by gasoline. The district's propane autogas fleet is comprised of 12 Type A Propane Micro Bird and 35 Type C Blue Bird Propane Vision buses.

### **Improving Air Quality**

Nevada's Alternative Fuel Vehicle Acquisition Requirement mandates 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 must adhere to these requirements.

Since 2013, WCSD's propane autogas school buses have logged 1.5 million miles and have helped improve the air quality in the Reno/Sparks area. Each bus averages 20,000 miles annually.

Equipped with ROUSH CleanTech propane autogas fuel systems, the buses emit 80 percent fewer smog-producing hydrocarbons and virtually eliminate particulate matter when compared to conventional diesel. WCSD's propane autogas Type C fleet reduces nitrogen oxide emissions by 59,000 pounds and particulate matter by about 1,200 pounds each year when compared with conventional diesel buses. The propane autogas Type A bus fleet will eliminate 1.1 million pounds of carbon dioxide over its life when compared with gasoline models.

The fuel systems are Environmental Protection Agency and the California Air Resources Board certified. Nontoxic, non-carcinogenic propane autogas is an approved alternative fuel under the Clean Air Act.

### **Reducing Costs**

The district's main objective of incorporating propane autogas buses has been to reduce emissions, but it has also realized cost savings. Currently, the district pays \$1.25 per gallon for biodiesel and \$.98 for propane, without federal tax credits. Although the district doesn't operate diesel buses, diesel in the Reno area averages \$2.85 — a 65 percent per gallon cost difference compared to propane autogas.

WCSD keeps on-going data collections to compare all aspects of its fleet maintenance which helps maintain a lower cost-per-mile.

In addition to fuel cost savings, the district pays less for oil changes. "Currently, we average almost \$24 savings per oil change for our propane autogas buses over our biodiesel buses," said Kelley. "This is due to the lower cost of the oil and filters, and not running diesel exhaust fluid on the propane models."

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

The district services its propane autogas buses with standard Blue Bird and Ford diagnostic equipment. Many of WCSD's technicians already had experience working with Ford engines, and after some initial training, found propane autogas engines straightforward and easy to maintain.

### **Driving with Efficiency**

The district's school bus drivers appreciate the quiet ride and the cleaner air resulting from reduced emissions. On board, the buses boast a safer ride to school as noise levels are decreased when compared to diesel counterparts, giving drivers fewer distractions. Drivers also note the strength of the buses' torque and power.

During the winter, WCSD's drivers aren't concerned with cold weather start-ups. With the ROUSH CleanTech fuel system, the 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. Throughout North America, the fuel system provides unaided cold weather starts to -40 degrees Fahrenheit.

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

All of WCSD's Blue Bird propane school buses meet and exceed Federal Motor Vehicle Safety Standards.

### **Fueling with Propane Autogas**

Washoe County School District operates three bus facilities. At its largest facility, the district installed a fueling dispenser with dual 1,200-gallon tanks. This fuel station accommodates the current fleet capacity of propane autogas buses. Each driver receives annual in-house training to ensure they're fully aware of the safety produces that must be followed when fueling a propane bus.

Installing a propane autogas station costs less than any other fueling station, including gasoline and diesel. The district plans to add a second station with two 6,000-gallon tanks. Once that station is operational, WCSD plans to continue purchasing more buses powered by propane autogas.

To extend its networking capabilities and best practices, WCSD joined the Energy Department's Reno-Tahoe Clean Cities program in which Kelley is 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 has also 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," said Kelley.

*About Blue Bird Corporation:* Blue Bird is the leading independent designer and manufacturer of school buses, with more than 550,000 buses sold since its formation in 1927 and approximately 180,000 buses in operation today. Blue Bird's longevity and reputation in the school bus industry have made it an iconic American brand. Blue Bird distinguishes itself from its principal competitors by its singular focus on the design, engineering, manufacture and sale of school buses and related parts. As the only manufacturer of chassis and body production specifically designed for school bus applications, Blue Bird is recognized as an industry leader for school bus innovation, safety, product quality / reliability / durability, operating costs and drivability. In addition, Blue Bird is the market leader in alternative fuel applications with its propane-powered and compressed natural gas-powered school buses. Blue Bird manufactures school buses at two facilities in Fort Valley, Georgia. Its Micro Bird joint venture operates a manufacturing facility in Drummondville, Quebec, Canada. Service and after-market parts are distributed from Blue Bird's parts distribution center located in Delaware, Ohio.

*About ROUSH CleanTech:* ROUSH CleanTech, an industry leader of alternative fuel vehicle technology, is a division of ROUSH Enterprises based in Livonia, Mich. ROUSH CleanTech designs, engineers, manufactures and installs propane autogas fuel system technology for light- and medium-duty Ford commercial vehicles, and Type A and Type C Blue Bird school buses. As a Ford QVM-certified alternative fuel vehicle manufacturer, ROUSH CleanTech delivers economical, clean and domestically produced fueling options for fleets across North America. Learn more at [ROUSHcleantech.com](http://ROUSHcleantech.com) or by calling 800.59.ROUSH.

*(Case study completed in 2016)*