

**Company:** Flint Mass Transportation Authority

**Industry:** Public Transportation

**Location:** Flint, Michigan

**Vehicles:** 2011 – 2016 Ford E-450 paratransit buses (101)  
2015 Blue Bird Vision transit buses (16)

**Fueling:** Private infrastructure:  
(4) 4,000-gallon stations  
(2) 6,500-gallon stations

**Challenge:** To continue environmental leadership among mass transportation agencies while building an alternative fuel fleet that is an economical replacement to diesel

### By the Numbers Since 2011:

- \$2 million saved in fuel and maintenance savings.
- More than 9.1 million miles logged on propane autogas vehicles.
- Almost 50 percent of the fleet runs on propane autogas.

Across the nation, transit agencies share the same goal: to provide quality transportation at an affordable cost for their communities.

For Flint Mass Transportation Authority (MTA), part of achieving this goal was transitioning to propane autogas paratransit shuttles. Since purchasing Ford E-450 paratransit shuttles in 2011, MTA has added brand new transit buses and more shuttles to its fleet, for a total of 117 vehicles fueled by propane autogas. With almost half of their vehicles running on autogas, the agency currently has the second largest autogas fleet in U.S. public transit.

Flint MTA transports nearly 470,000 passengers through its paratransit service. Seniors, persons with disabilities and the general public rely on MTA's "Your Ride" curb-to-curb shuttle bus service within the City of Flint and Genesee County. And, Community Transit buses travel fixed routes throughout the area. As buses in its fleet age, MTA continues to replace them with alternatively fueled vehicles.

### Researching the Alternatives

Flint MTA's decision to explore alternative fueled vehicles aligns with an underlying mission: Provide sustainability for the future, both economically and environmentally. During its extensive research, the agency examined many factors, including refueling

needs; vehicle availability and warranty; rider requirements; and the fuel itself. The agency also considered that fuel systems designed by companies with Ford Qualified Vehicle Modifier (QVM) status would retain the original factory Ford warranty, an important factor for the agency.

In 2010, Flint MTA received a Federal Transit Administration (FTA) grant through the “State of Good Repair Program” to purchase natural gas buses. This program funds the maintenance and upgrading of vehicles to ensure that the nation’s public transit “operates safely, efficiently, reliably and sustainably.” It provided 80 percent funding with a required 20 percent match.

Although that package appeared advantageous, MTA learned that upgrading its fueling stations to include natural gas would cost in excess of \$1 million per station. In contrast, they could install 10 propane autogas stations for the price of just one natural gas station. The agency requested and received a grant amendment to allow for propane autogas instead of natural gas buses.

### **Selection and Funding**

Flint MTA selected the Ford E-450 cutaway equipped with the ROUSH CleanTech propane autogas fuel system. The versatility of the vehicle platform allowed the agency to enhance its bus features, including more passenger and wheelchair capacity. The 41-gallon fuel tank provides the agency a 200-mile driving range.

In 2015, MTA worked with Blue Bird to create a propane autogas fueled Type C bus for fixed route service. The agency’s 16 transit buses come with a 5-year, 100,000-mile warranty. Purchased as commercial buses, the Blue Bird Propane Visions were upfitted for public transit use with transit windows, seating, destination sign and two wheelchair positions.

These buses are Altoona-test rated for 350,000 miles or 10 years. Each 39-seat bus is equipped with a 6.8L Ford engine, a ROUSH CleanTech fuel system and a 93-usable-gallon fuel tank. Flint MTA says the buses average 325-mile range per tank.

MTA also considered the vehicle’s Altoona-testing, named for the primary test facility location. This FTA New Model Bus Testing Program rates new transit bus models on safety, structural integrity and durability, reliability, performance, maintainability, noise and fuel economy. Purchasing alternative fuel vehicles tested through Altoona allows eligibility for FTA funding. These federal funds cover 85 percent of the entire alternative fuel vehicle cost, with a 15 percent local match.

“The Altoona-tested ROUSH CleanTech Ford E-450 and commercial Blue Bird Propane Vision buses provide huge financial assistance for any transit agency looking to operate on alternative fuels,” said Edgar H. Benning, general manager of Flint MTA.

### **Clearing the Air**

Fueling with domestically produced propane autogas offers Flint MTA a cleaner emissions

profile. By operating on propane autogas, MTA eliminates more than 200,000 pounds of carbon dioxide during the lifetime of each Ford E-450, and 800 pounds of nitrogen oxide and 35 pounds of particulate matter every year for each Blue Bird bus.

Compared with gasoline-fueled vehicles, propane autogas vehicles emit about 20 percent less nitrogen oxide, 60 percent less carbon monoxide, and up to 24 percent less greenhouse gases. Compared to diesel, propane autogas releases virtually no harmful particulate matter.

### **Price-Competitive Propane**

Along with its environmental benefits, domestically produced propane autogas is economical. Historically, propane autogas costs up to 40 percent less than gasoline and about 50 percent less than diesel. Flint MTA has experienced even greater savings, paying a 2016 locked-in price of \$.75 per gallon for autogas compared to \$1.65 for diesel.

Current federal tax credits provide an additional 36-cent per gallon savings, bringing their propane autogas cost to less than 40 cents per gallon. Flint MTA expects to save \$70,000 per shuttle bus during their normal lifecycle of 10 years and 350,000 miles, for a total savings of more than \$5 million — before any fuel tax credits.

"Propane autogas is the ideal fuel to drive down operational costs and to carry out our commitment to reducing our exposure to unstable imported fuel prices," said Benning. "And the vehicle performance has been excellent."

### **Real-World Savings**

So far the agency has driven about 9.1 million miles in its propane autogas vehicles. A recent MTA analysis shows the agency paid \$.13 per mile for propane autogas (or 4.5 cents with tax credits) compared to \$.24 per mile for gasoline and \$.19 per mile for diesel.

In addition to fuel savings, the agency benefits from lower maintenance costs by fueling with propane autogas. Their propane autogas vehicles require just six quarts of oil compared to 16 quarts for their diesel vehicles, with oil changes needed every 7,500 miles compared to 4,000 miles for their diesel shuttles. Plus, the filter packages for propane autogas are priced two-thirds less than the diesel filters. In-house driver training increased the agency's miles-per-gallon driving record by 8 percent, saving thousands more each year.

"With autogas, we're saving almost as much in preventative maintenance as we are with the fuel," said Lynn McLean, director of maintenance vehicles, facilities and alternative fuels for Flint MTA.

### **Saving Time at the Pump**

At the pump, Flint MTA saves time, too. At eight gallons per minute, MTA drivers find fueling time quicker when compared to their conventionally fueled shuttle buses, which refuel at about five gallons per minute. The Flint MTA maintenance team handles fueling the Vision buses.

For fueling convenience, the agency installed six propane autogas stations. Flint MTA services all of Genesee County's 640 square miles, and drivers are rarely more than 15 miles from a fueling facility.

### **Implementing and Sharing Best Practices**

These successes have led Flint MTA to plan for more alternative fuel growth, with a goal of 60 percent reduction in diesel usage by 2018. Immediate plans include the addition of nine more Ford E-450 shuttles and at least 12 more commercial Blue Bird Propane Visions in 2016.

Others have noticed Flint MTA's success and offered accolades: In 2015, the agency received Fleet Tech Expo's 2015 Certificate of Achievement Award for a top-tier, heavy-duty sustainable fleet.

Green Fleet named the agency a 2013 Sustainability All Star and the Propane Education & Research Council awarded Flint MTA a "Top Fleet User of Clean Burning Propane Autogas" award in 2013.

"We constantly receive inquiries from across the nation and even internationally about our propane autogas program," said Benning. "We're glad to be an important and leading part of the alternative fuel movement among transit agencies." The agency has developed a presentation about its research and implementation plan for autogas.

*About Flint Mass Transit Authority:* The Flint Mass Transportation Authority is the agency authorized to provide public transportation services in Flint and Genesee County in Michigan. The MTA's services include primary fixed routes, peak routes (running only during designated times) curb to curb service (known as "Your Ride"), specialized services for the elderly and persons with disabilities, and maintenance of the Flint Transportation Center, Community Services Centers, Greyhound and Amtrak Rail Station in Flint.

*About ROUSH CleanTech:* ROUSH CleanTech, an industry leader of alternative fuel vehicle technology, is a division of ROUSH Enterprises based in Livonia, Michigan. 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.

(Completed in 2016)

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