



U.S. Department of Transportation  
Federal Transit Administration



## Using the Birmingham NFCBP Bus for Regional Outreach in Ohio

### Background

This report is an addendum to the final report to the Federal Transit Administration (FTA) covering the project performance and results for the development, build, and demonstration of a fuel cell electric bus in Birmingham, Alabama. Following that demonstration, the bus was shipped to the Stark Area Regional Transit Authority (SARTA) in Canton, Ohio. SARTA staff were trained on and repaired the bus, which was then used in educational outreach to middle schoolers in Ohio. This project also included a study evaluating the performance of hydrogen fuel cell buses in comparison to conventional fuel technologies.

### Objectives

The objectives of the National Fuel Cell Bus Program were to promote the commercialization of fuel cell electric bus technologies through demonstration of buses and to increase public awareness and acceptance of the technology. This project met these goals by introducing SARTA to a different fuel cell bus than it had previously experienced and by educating middle schoolers about the technology. Additionally, the research findings from this study provide quantitative insight into how fuel cell buses perform compared to conventional technologies.

### Findings and Conclusions

*Hydrogen fuel cell buses have higher acceleration than other propulsion types and fuel consumption similar to diesel buses but less than CNG vehicles and can pull into traffic more easily than other buses.*

During the project, staff from the original bus build and SARTA repaired an issue that had been causing problems in Birmingham with the traction motor and air conditioning, which would not operate simultaneously. This was resolved by installing an electronic filter in the bus. Other issues were repaired prior to using the bus for outreach to middle schoolers. In the research component of the project, the team evaluated speed profiles for diesel, diesel electric, CNG, and hydrogen fuel cell buses. Results indicated that the hydrogen buses experienced fuel consumption similar to the diesel buses but less relative fuel consumption than the CNG vehicles. Other comparisons focused on vehicle acceleration metrics; the hydrogen fuel cell buses experienced much greater positive acceleration values than the diesel and CNG buses, even though the average acceleration was similar when controlling for different routes. Quantitative evidence is provided that fuel cell buses can pull into traffic more easily than other buses.

## Benefits

This report documents the repairs required to an early fuel cell electric bus, outreach events conducted with middle schoolers, and the performance of fuel cell buses compared to conventional technologies. These evaluations may be useful for bus manufacturers, transit operators, educators, and government agencies making policy decisions or determining future research needs.

## Project Information

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