



Florida Department of Transportation Research Investigation, Quantification and Recommendations – Performance of Alternatively Fueled Buses BDV26-977-01

Volatile fuel prices and the need to reduce carbon emissions have caused many U.S. transit agencies to invest in vehicles that use alternative fuels. These vehicles have different patterns of costs than traditional, diesel-fueled vehicles, and the Florida Department of Transportation (FDOT) is interested in collecting and analyzing up-to-date data on alternatively fueled vehicles (AFVs) and their performance. This information will help FDOT evaluate the benefits and costs of AFVs.

In this project, University of South Florida researchers sought data about AFV use in Florida and around the U.S. The researchers had already worked with FDOT to create a system for collecting transit fleet performance and cost data as part of FDOT's continuing interest in regular data collection, monitoring, and evaluating field data on the performance and operating costs of AFVs nationwide. That work included development of the BuFFeT software, the Bus Fuels Fleet Evaluation Tool, and one goal of this project was to update the BuFFeT cost model.

The researchers sent forms requesting data to all fixed route transit agencies in Florida. They also coordinated with the American Public Transportation Association in efforts to collect data from agencies outside Florida. Efforts were made to collect information for both fixed route and demand response vehicles.

Data were collected from eight Florida agencies. No data were returned from agencies outside Florida. For responding agencies, the researchers found that agencies did not all have regular, quarterly reporting, but five agencies provided 2013 data sufficient for analysis. The only AFVs for which data were available were diesel-electric hybrids.

The researchers found that the traditional fleet comprised 40-foot, 35-foot, and 32-foot buses, at 89, 6.8, and 6.3 percent of the fleet, respectively. AFVs were on average larger with



Diesel-electric hybrids (foreground) are being more widely used by Florida transit agencies.

60-foot articulated buses (26.5 percent) and 40-foot buses (38.6 percent). The researchers compared traditional vehicles and AFVs in terms of acquisition cost, fuel economy, parts cost per mile, and maintenance cost per mile. AFVs had a higher acquisition cost, but lower costs in other areas. AFVs tended to be newer, which might have accounted for the differences, so the same measures were weighted by miles traveled per vehicle. This lowered the differences, but AFVs still had significantly lower costs. As hybrid technologies continue to mature, these advantages can be expected to improve.

To assist agencies in learning about AFVs, the research team created a website, the Advanced Transit Energy Portal, to assemble information from many sources, including agencies, industry, laws, incentives, and other publications. This was the first effort toward the development of a National Alternative Fuel Bus Clearinghouse.

As the use of AFVs by public transit agencies continues to increase, better data collection and management tools, supported by projects like this one, will promote the wider adoption of these vehicles with their many advantages for both agencies and the general public.