

## Fuel Cell Bus Cruises the Streets in a Test of Abilities

By FRANKLIN A. HOLMAN

(July 31, 2003) The most technologically advanced bus to hit the streets of Los Angeles is now on loan to MTA from the Air Quality Management District and ISE Research Corp. in San Diego.



MTA is evaluating the hydrogen-powered fuel cell bus, which has been cruising the streets of Los Angeles since July 7, and will continue in testing through Aug. 7. The possible future of transit, the fuel cell bus is truly "Zero-emission," and features extremely quiet operation.

"We are testing this bus in aggressive, stop-and-go service on some of our toughest routes to put this bus through its paces," says Michael Bottone, MTA's Director of Vehicle Technology.

During the test, the fuel cell bus follows a Metro Bus in revenue service over such routes as Line 40 from South Bay Galleria to Union Station, Line 2 on Sunset Boulevard, and Line 4 on Santa Monica Boulevard.

The testing also considers weight, durability and fuel range. The bus will have covered more than 1,400 miles of service when the testing is complete.

"We've been following 'in-service' MTA buses to get a handle on how this bus will perform," says Bottone. "When the bus we're following pulls in, the fuel cell bus operator pulls in. When the in-service bus pulls out, we pull out. This way we are putting the bus through the same paces of stop-and-go operation."

### Outstanding performance

The fuel cell has demonstrated outstanding performance thus far in the testing period.

"So far we have not had any down time due to the fuel cell," Bottone says. "Every time we turn it on, the fuel cell is ready to go."

Despite the fact that the fuel cell has performed well, there are obstacles to overcome before it will be used – namely price.

"The cost of fuel cells right now is horrendous," Bottone says.

"If you wrap it all together, the bus, the integrator and the fuel cell, it would cost \$3.2 million per vehicle, as opposed to a standard bus at about \$320,000."

**How it Works** - Hydrogen is taken under pressure from a on-board storage tank, and delivered into the fuel cell. The hydrogen flows through a membrane into a chamber where air, also passing through a membrane, creates an ionic or electrical exchange. Positive and negative charges are collected and sent to inverters and controllers for distribution, ultimately providing enough electricity to power wheel motors and other on-board systems (air conditioning, power steering). The only by-product of this exchange is water, which is expelled out through the exhaust system.

Other obstacles include minimal fuel storage and a limited number of hydrogen fueling stations. Until these obstacles are overcome, the fuel cell bus will remain on the backburner.

"Is it going to happen in the next five or six years, probably not," Bottone says. "But in 10-15 years, it will most likely be the way transit systems are moving people from point A to point B."

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