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(*** Special to **PASSENGER TRANSPORT** ***)

LACMTA OKAYS COMPRESSED NATURAL GAS FOR REGULAR FLEET USE FOLLOWING RIGOROUS FIVE-YEAR DEMONSTRATION

In 1989, the Los Angeles County Metropolitan Transportation Authority's (MTA) Alternate Fuels team began tests on a fleet of 30 methanol-powered buses and a fleet of 10 compressed natural gas (CNG)-powered buses.

The goal: to put the buses through the regular paces of the demanding life of an average MTA bus to see how well the fuels performed in a variety of terrain, temperatures and passenger loads. The tests were scheduled to cover a two-year period.

Two years and more than 1 million miles later, MTA's methanol fleet was proclaimed a success, and 303 more methanol buses were purchased for general use. While methanol still did not perform as efficiently as diesel, its superior low-emissions performance made it attractive to a Board of Directors that faced ever-tightening clean air regulations in the Los Angeles area.

Meanwhile, the CNG fleet was still trying to come of age. MTA's Alternate Fuels maintenance specialists tested CNG engines configured three ways, attempting to coax the best possible performance from the relatively untested bus fuel. It would be three more years before one engine configuration performed well enough to pass MTA muster.

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Now that CNG is certified and has acceptably matured, MTA is preparing to purchase more than 230 CNG-powered buses to add to its expanding fleet of alternatively-fueled buses.

"We have consciously tried to stay away from directly endorsing any one fuel over another," explains Jeff Johnson, supervising engineer in the Alternate Fuels section. "In 1991, we showed that methanol was a viable fuel for use in a major public transportation provider's bus fleet. It took a bit longer for CNG to reach that status. But now that it has, it has become another alternate fuel of choice for the MTA."

Johnson says methanol has continued to perform acceptably since the 303 methanol-powered buses were introduced into the fleet, though some nagging maintenance issues have kept MTA's alternate-fuel maintenance crew searching for creative solutions.

"One of the inherent problems with the kind of pioneering research we are doing here in Los Angeles is that, as you experiment with a new technology, failures are bound to occur," Johnson says. "That's all part of the learning process."

As an example, Johnson noted that methanol bus engine injectors regularly leaked, even after the initial two-year demonstration was complete. Engine manufacturer Detroit Diesel has been working closely with MTA to solve the problem. A newly-designed injector has been installed on 200 of the buses with encouraging results so far -- only one leaky injector.

"We have found a CNG engine that performs well under the strenuous conditions here in Los Angeles County," Johnson said. "But this does not mean we will stop our CNG testing and research. As with methanol, our Alternate Fuels unit is continually working to improve engine performance on all kinds of fuels."

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Liquefied natural gas (LNG) is another up-and-coming rookie on the public transportation playing field. "LNG is not a new technology," Johnson points out. "The aerospace industry has used it for some time. But it's new to us." An LNG bus being prepared in Detroit is scheduled to arrive soon in Los Angeles for tests.

"As with the methanol and CNG buses that came before it, the LNG bus will be treated very specially," Johnson says. "It will be used as a test tool for the future." One advantage LNG enjoys over CNG is that it does not require the bulky storage tanks needed for CNG. However, LNG must be stored at a frigid minus 260 degrees Fahrenheit.

Local clean-air requirements state that 30 percent of all bus fleets must have zero emissions by the year 2010. MTA has considered two options for achieving this goal. The first was an electric trolley bus system, which the MTA Board recently voted to forgo in favor of researching fuel cell technology.

"The fuel cell powered bus is poised to meet the zero-emissions requirement," Johnson says. "There are three fuel cell technologies available for testing right now. We have been chosen as one of the properties to help refine the fuel cell bus."

The three kinds of fuel cells are phosphoric acid, proton exchange membrane and alkaline, each featuring its own unique chemical reactions to provide the power to propel an electric bus. Johnson says MTA will probably get one of each to test.

Eventually, when a single fuel cell technology emerges as the most viable, it will likely power MTA's Advanced Technology Transit Bus (ATTB), or "Stealth Bus," a low-floor, lightweight bus now being designed by the Northrop Corporation in cooperation with the MTA.

In addition to researching its own fleet, MTA is well equipped to help other commercial vehicle operators meet their clean-air goals as well. MTA's Emissions

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Testing Facility, on line since 1991, has steadily become busier since it opened as semi trucks and other large commercial vehicles roll onto the chassis dynamometer for emissions testing.

A much more recent addition to the laboratory is the engine dynamometer which is capable of analyzing the performance of the entire engine, not just the emissions. "The chassis dynamometer will give you accurate emissions readings, but every vehicle will yield a different reading," Johnson says. "That's the beauty of our setup now -- taken together, the two dynamometers will give a true emissions analysis, based on the specific qualities of the engine family and the exact road conditions under which individual engines travel."

As a new millennium approaches, the MTA's Alternate Fuels Section will no doubt stay very busy, as long as community leaders continue to strive for a cleaner environment. "Everyone in MTA's Alternative Fuels Section feels a strong sense of mission in our every day work," Johnson says. "We know that the research we're doing will affect millions of lives in the future.

"It's difficult, demanding work -- and we love it."

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