

TUG Tidbits

Newsletter of the Natural Gas Transit Users Group



Arlington (VA) Transit

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Transit and School Bus Fuel Economy – TUG Webcast 3

TUG held its third quarterly webcast on December 4, with a presentation and discussion of Transit and School Bus Fuel Economy (contact Hank Seiff at hseiff@cleanvehicle.org or 703-534-6151 for a copy of the PowerPoint™ presentation).

The presentation was based on the assumption that fleets with an “ordinary” (non hybrid) natural gas or diesel bus want to maximize its MPG. It also points out that natural gas is presently selling for 50-60% of diesel (per diesel gallon equivalent) and that's BEFORE the Federal \$0.50/gallon rebate!

Driver, maintenance, and equipment related ways of improving vehicle mileage were discussed, such as:

Driver, Maintenance:

- Slow down, if possible
- Proper tire pressure
- Lower RPMs lower fuel consumption
- Less idling
- Drive more “gently”

Equipment:

- Lower HP engine
- Better transmission/drivetrain match
- Low rolling resistance tires
- Wide based singles (tires)
- Low HP engine accessories
- Better aerodynamics
- Lower tare weight
- Synthetic lubricants
- Hybrids
- Alt fuels
- Additives/mileage enhancers (these almost never work!)

By far the least cost and most effective ways of improving fuel economy are to drive the vehicle “more gently,” and decrease idling time. However, changing longstanding driver (and management) habits may be difficult.

The presentation also discusses ways to objectively measure the effectiveness of changes to improve fuel economy.

Our next TUG webcast will be held in March, 2008 - you will receive an email notice 3-4 weeks in advance. Please contact Hank Seiff (hseiff@cleanvehicle.org, 704-534-6151) to suggest topics you'd like us to cover.

Emergency Response Procedures for Natural Gas Transit Vehicles

Sponsored by the Federal Transit Agency, the Transit Cooperative Research Program has published a synthesis of transit practice titled *Emergency Response Procedures for Natural Gas Transit Vehicles*. The study “identifies and documents the state of the practice on emergency response protocols to incidents involving natural gas... transit buses.” It is designed to assist first responders to natural gas incidents - emergency response professionals such as police officers and fire-fighters; transit agency operations and maintenance employees, police, and security guards; and certain members of the general public.

In addition to basic information about natural gas and general information on emergency practices, this document contains sections of emergency response guides and manuals used to educate first responders on CNG in buses and in maintenance facilities from three transit agencies. Chapter 7 provides some good suggestions on helping first responders handle natural gas bus incidents, both by making relatively small changes to the bus to identify gas shut offs, PRDs, etc. and by simplifying the use of manuals provided to first responders.

The document also explains why fire departments are often reluctant to attempt to control fires in natural gas buses and prefer to make sure the area is safe and simply

let the fire burn itself out. They fear natural gas leakage and explosion, or simply lack recent experience with fighting natural gas bus fires.

A free copy of *Emergency Response Procedures for Natural Gas Transit Vehicles* can be downloaded from http://www.trb.org/news/blurb_detail.asp?id=4806

NREL Reports on Fuel Cell Buses

The Department of Energy's National Renewable Energy Laboratory (NREL) recently published two reports on fuel cell buses in the United States. The first (<http://www.nrel.gov/hydrogen/pdfs/42249.pdf>) is an evaluation of fuel cell buses in service at AC Transit in Oakland, CA. This report updates an earlier version and includes results and experience through August 2007. The evaluation compares three fuel cell buses to new diesel baseline buses operating from the same bus depot. The 40-ft Van Hool fuel cell bus features an electric hybrid drive system by ISE Corporation with UTC Power's PureMotion 120 Fuel Cell Power System and ZEBRA batteries for energy storage. During the data collection period (April 2006 - August 2007), the fuel cell buses operated more than 54,000 miles with an overall fuel economy of 6.17 miles per kg which equates to 6.97 miles per diesel equivalent gallon. For comparison, AC Transit's diesel buses average 4.03 miles per gallon.

The second report (<http://www.nrel.gov/hydrogen/pdfs/41967.pdf>) reviews past and present fuel cell bus technology development and demonstration. This review includes results from the U.S. Department of Energy/NREL fuel cell bus evaluations as well as plans for the U.S. Federal Transit Administration's National Fuel Cell Bus Program. The primary focus is on descriptive comparisons of fuel cell transit bus operation in the United States and on industry's need to continue successful implementations of these advanced technologies.

The report summarizes overall accomplishments and explores implementation and operational experiences at three DOE/NREL evaluation sites:

- Santa Clara Valley Transportation Authority (VTA) in San Jose, California, along with partner transit agency San Mateo County Transit District (SamTrans) in San Carlos, California
- SunLine Transit Agency in Thousand Palms, California (in the Palm Springs area)
- Alameda-Contra Costa Transit District (AC Transit) in Oakland, California, along with its partner transit agency, Golden Gate Transit (GGT) in San Rafael, California

NREL's Technology Validation team evaluates fuel cell buses for the Hydrogen, Fuel Cells, and Infrastructure Technologies Program within the U.S. Department of Energy. All fuel cell bus publications can be found at this link: http://www.nrel.gov/hydrogen/proj_fc_bus_eval.html

New Natural Gas Bus Purchases in the US

Arlington, VA - Arlington Transit (ART) operates within the 26 square mile boundaries of Arlington County, VA, just across the Potomac River from Washington, DC.

ART's current fleet of 30 small compressed natural gas ADA-accessible buses has recently been augmented by eight new heavy-duty CNG NABI buses, featuring low-floors and front entrance ramps. Each bus seats up to 30 passengers and is equipped with two areas to serve passengers using wheel chairs.

"After the purchase of the first two diesel buses, ART committed to only purchasing alternatively-fueled buses. In an effort to be environmentally friendly, ART purchases buses fueled by compressed natural gas (CNG), making the entire fleet 'clean and green.'" (Source: ART Forum)

Santa Clarita, CA - the city council of Santa Clarita, California approved the purchase of 22 CNG buses, 14 of which will be for the city's Dial-A-Ride program that provides transportation services for the elderly, disabled and the general public. (Source: NGVAmerica newsletter)

Los Angeles, CA - The Los Angeles Board of Airport Commissioners approved a five-year contract to operate non-stop bus service from Union Station to Los Angeles International Airport (LAX), replacing the LAX FlyAway service pilot program, which used diesel buses, with a new fleet of smaller CNG buses.

"By establishing this service long-term and replacing the fleet with clean-fueled buses, the entire city benefits both from reduced traffic congestion and better air quality."

The new 21-passenger buses are expected to be more efficient for ridership levels during the 24-hour/7 days a week operation, and in addition to the comfortable reclining seats, the new CNG buses will offer free WiFi Internet service and airline style snack trays on the seat backs. The new buses are being phased-in starting this month. (Source: Los Angeles World Airports Press Release)

New Natural Gas Bus Purchases Overseas

Pakistan - The government and the private sector plan to invest over Rs 35 billion (\$US 575 million) to purchase CNG buses in the next five years to provide better transportation services. 5,000 large and 3,000 medium sized CNG dedicated buses are expected to be introduced by the private sector over the next five years, while the government would provide interest subsidy and an enabling environment to the pri-

vate sector. The project would be launched in Karachi and extend to Lahore, Rawalpindi/Islamabad, Faisalabad, Multan, Quetta, Hyderabad, Peshawar and Gujranwala. (Source: International The News)

India - The Chief Minister of India's National Capital Territory reported that CNG fueled buses have provided the city with the cleanest public transport fleet in the world, and, therefore, CNG use will be expanded. "In the past six years, all old commercial vehicles have been phased out and 1 lakh [100,000] vehicles involved in public transport in Delhi have been put on clean CNG fuel that has helped in substantial improvement in the ambient air quality of the city," she said.

The Chief Minister further said that the government was committed to purchasing more than 1,000 new low-floor CNG buses, at a cost of 5 billion rupees (\$US 126 million) as part of a strategy to make the city pollution free by 2010. She said that the government was just two weeks away from finalizing a policy that will see 40,000 light commercial vehicles converted to CNG operations. (Source: NGV America Newsletter)

Spain - New CNG buses has been integrated in the urban transport fleet. Besides the reduction in pollutant emissions, reductions in smell, vibrations and noise have been measured by different surveys of passengers and drivers. Barcelona Metropolitan Transport has become the pioneer CNG bus operator in Spain (Source: Civitas Website)



Peru - As many as 2,000 buses could be converted to compressed natural gas in Lima in the coming months, providing cleaner transport for as many as half a million commuters who use the buses daily. Climalatino reports that the conversions will go ahead subject to assurances for the forty fleet operators involved that sufficient dispensers will be available to supply fuel for the vehicles. (Source: NGV Global)

France - The French city of Lille will be powering its 100-plus transit bus fleet using renewable natural gas made from organic household waste, thanks to a pioneering recycling plant. In a project unique in Europe, the plant will supply the northern French city with 1.1 million GGEs of renewable natural gas per year -- enough to power all the buses in the Lille fleet -- produced from food scraps, weeds, flowers and grass clippings. It is to start supplying the city's existing fleet of natural gas buses this year, and is to be fully operational by end 2008, handling 108,600 tons of green waste per year. (Source: NGV America Newsletter)

London's Mayor Announces Europe's Largest Fleet of Hydrogen Buses

The Mayor of London, Ken Livingstone, announced that ten new hydrogen powered buses will join London's bus fleet by 2010. When operational on London's streets, the hydrogen fuel cell-powered vehicles will produce no pollution or carbon dioxide, a major contributor to global warming, and will help improve the city's air quality.

Transport for London has signed a contract with ISE - an American company with a record of delivering hydrogen buses - for five hydrogen fuel cell buses and five hydrogen internal combustion engine buses. The ISE contract for \$19.86 million covers the initial cost of the vehicles themselves and also the specialist maintenance and replacement parts over a five-year period after delivery.

Ken Livingstone said: "Hydrogen is a fuel of the future as it improves air quality and does not produce the harmful emissions which are causing catastrophic climate change. These ten new hydrogen vehicles will be clean and efficient, providing a smoother, quieter ride for passengers. London is now the first city in Europe to commit to a hydrogen bus fleet of this size, which will match traditional diesel buses in terms of performance. This represents a huge step forward from the previous hydrogen trials in the capital and is an important step towards my target of having five per cent of all public sector fleet vehicles powered by hydrogen by 2015." (Source: Greater London Authority Press Release)

Please send all questions, comments, requests for information, etc. to Hank Seiff at 703-534-6151 or hseiff@cleanvehicle.org. See the TUG website at <http://www.nrel.gov/vehiclesandfuels/ngvtf/tug.html>