New bus system tops off batteries in just 15 seconds

June 4 2013, by Bob Yirka

(Phys.org) —A new type of battery bus system being tested in Switzerland is able to operate continually by making use of flash-charging stations. Called Trolleybus Optimisation Systeme Alimentation (TOSA), the new bus and recharging system is currently being tested on a one mile route in Geneva between the city's airport and international exhibition center.

The system is designed to allow for quickly "topping off" batteries at bus

stops, with a longer charge of just three to four minutes between bus runs. Buses are equipped with a laser controlled arm that sits atop the bus and automatically guides the contact mechanism to its mate in an overhanging charging station. Passengers get on and off the bus just as they would any other bus.

The system was designed by Zurich based electronics giant ABB with assistance from Geneva Public Transport and other city agencies. The TOSA system flash charges at a rate of 400 kW, allowing batteries to be topped off in just 15 seconds every few stops. Officials describing the system call it a truly zero-carbon emission system because the electricity to recharge the buses is generated using hydroelectricity. They noted also that such a bus system would be a big improvement over conventional electric buses that get their power from overhead lines and also other battery run buses that must be taken out of service periodically for recharging. They claim also that despite such frequent recharging, the batteries in the buses are expected to last for at least a decade.

The TOSA system, two years in the making, was designed to be used in areas of heavy congestion, where ridership would be high—the test bus is 19 meters long and can hold 135 passengers. The test run of the system is designed to highlight potential problems with the system to allow for improvements to be made. Once that happens, ABB plans to sell the system to other cities around the world—that could mean the end of loud diesel buses spewing smoke or overhead electrical lines cluttering the view from the street. ABB also says that its system is more cost-effective than other mass transportation systems and more flexible as well because it allows for different types of designs for the charging stations.

More information: www.tosa2013.com/en#/tosa2013