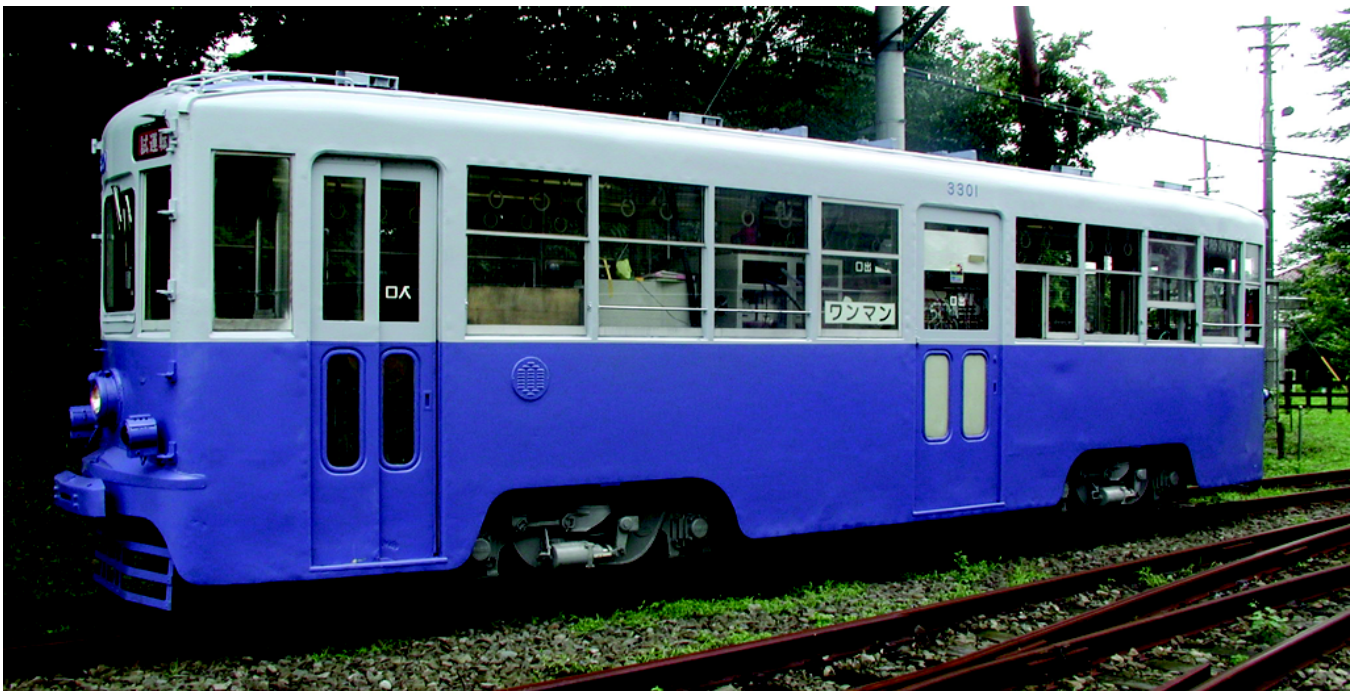


## Battery-powered Tram Developed by RTRI

A tramcar being developed by Japan's Railway Technical Research Institute (RTRI) may eliminate unsightly overhead wires in the future. It is powered by on-board rechargeable lithium-ion (Lilon) batteries commonly used for hybrid cars. The rapid charge-discharge cycle of Lilon batteries as well as their high energy density (33 kWh) and light weight make them ideal for driving rail vehicles. Moreover, the quick charge-discharge cycle is suited to regenerative braking, which converts kinetic energy into electric energy when the electric brake is applied and the traction motor acts as a generator. This very efficient system recovers up to 75% of braking energy, without wasting it as frictional heat, enabling nearly 50% of the kinetic energy to be restored in the batteries. The prototype tramcar was able to make 15 round trips on a 500-m test track with a brief stop at each end, before the batteries dropped from full- to half-charged level. The rapid charging characteristics of Lilon batteries permit full recharging while standing for a few minutes at a terminus. The current R&D is focused on increasing battery capacity to provide power for on-board equipment such as air conditioners, as well as extending battery life. When this technology successfully comes into practical use, almost pollution-free public transport could save many historic towns where overhead wires for conventional tramways disfigure attractive townscape.



RTRI's battery-powered tramcar eliminating overhead wires (top) and its on-board battery unit (bottom) with measuring equipment on left and battery equipment on right

Photos: RTRI

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# Southern Half of Kyushu Shinkansen Opens

JR Kyushu opened its first shinkansen line between Shin Yatsushiro and Kagoshima-chuo (126.1 km) on 13 March 2004. The line forms the southern half of the 256-km Kyushu Shinkansen connecting to the San'yo Shinkansen at Hakata. Until the northern half is completed, the line will remain isolated from the main high-speed network covering major cities in Japan with a route length of 2000 km. Five sets of six-car Series 800 trains offer 32 daily super-express services (nicknamed *Tsubame* meaning Swallow) in each direction, with a maximum speed of 260 km/h. For passengers travelling from Hakata to Kagoshima, the conventional *Relay Tsubame* express services connect to shinkansen sharing the same platform at Shin Yatsushiro, enabling transfer within 3 minutes and cutting total travel time by 100 minutes to about 2 hours and 10 minutes. The Kagoshima main line between Yatsushiro and Sendai has been transferred to the newly founded third-sector Hisatsu Orange Railway while the remaining sections continue to be operated by JR Kyushu.



Long nose and white body of JR Kyushu's Series 800 *Tsubame*



*Tsubame* logo design



The 2+2 seating with natural wooden armrests



Japanese-style deck using natural colours such as lacquer



Japanese-style rush curtains from Yatsushiro area

Photos: JR Kyushu