

ENVIRONMENTAL AND SUSTAINABILITY FORUM

Presentation and engineering trial ride on GWR's battery train

Members of the Environment and Sustainability Forum (ESF) participated in a 'High Passenger Load' test on Great Western Railway's (GWR) Fast Charge Battery Train Trial. Nikki Hunter from Network Rail organised 30 places for CILT members to join 230 volunteers from various rail organisations on the test run at West Ealing station.

The trial took place on the short Greenford branch line, less than 3 miles long with three intermediate stations. All volunteers were weighed and allocated to carriages, creating a passenger load of over 20 tonnes – significantly higher than previous tests with only 102 volunteers.

The test train is a rebuilt former District Line 'D stock' unit with three carriages, featuring comfortable seating and bright lighting. Operating entirely on battery power, it runs very quietly with just a faint hum from electric traction motors. Originally developed by Vivarail, the project was rescued by GWR after Vivarail's financial administration.

The train charges from a static battery storage unit in a repurposed shipping container at West Ealing station. The system uses 'opportunity charging' – a four-minute top-up each time the train returns to the station via ground-mounted charge rails and RFID technology for positioning. The charger is rated at 670MW, and the rails are only energised when the train is correctly positioned for safety.

Testing explores various factors affecting range, including gradient, weather, and driving style. Interestingly, running heaters on cold days drains batteries more than carrying a full passenger load. The train's



range is estimated at 130 miles empty or 120 miles with passengers, aided by regenerative braking.

The train has six Lithium Iron Phosphate batteries weighing 10 tonnes, with an

operational life of about 10 years. The optimum charge level is 60-80% to allow for regenerative braking. The regular diesel service creates about 250 tonnes of CO₂e annually, whilst the battery train offers significant environmental benefits and reduced noise for local residents.

GWR plans to introduce regular passenger service on the Greenford branch later this year, with potential applications on other non-electrified branch lines in the Thames Valley and Cornwall. The technology could also be fitted to other rolling stock or combined with overhead lines for longer routes.

Following the trial runs and an emergency detrain exercise, participants attended a presentation on the project's learnings. The trial demonstrates major environmental benefits and shows promise for sustainable rail transport on branch lines. ■

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