

DRIVERLESS TRAINS ON LONDON UNDERGROUND

by John Hawkins

This is the title of a Network Business Case, dated August 2020 and leaked to ASLEF in late-October 2020. It was prepared in connection with ongoing Government discussions about future TfL funding. It concludes that the high up-front costs of conversion of lines are not offset by savings over the life of equipment. Significant customer benefits arise from level boarding, gap fillers and platform edge doors, considered essential for driverless operation, but these could be provided without the cost of such conversion. The major benefit of upgraded lines comes from the introduction of conventional automatic train operation, currently in progress on the sub-surface lines. There is some benefit in adding driverless operation at the time of line upgrades, but not when other equipment is part-way through its expected life. It is suggested that driverless operation be considered as part of future line upgrades, but it is unlikely to be justified ahead of planned capacity enhancements. The Victoria Line has a better case than the Piccadilly Line, with a small fleet and few platforms serving high demand throughout. The sub-surface lines have a very poor case at the opposite extreme. The Waterloo & City Line is a unique case with four platforms and five trains, still with a negative financial return but high non-financial benefits.

One could ask why the DLR can run driverless trains into a traditional open platform at Bank when other lines can't. The presentation explains that the DLR demonstration light rail system dates back to the mid-1980s and has grown to meet rising demand whilst holding 'grandfather rights' to its method of operation. It has straight, level access platforms and low ridership, its ten busiest station pairs having around 18,247 boardings compared to 66,325 on LU, so only 28% of LU demand. Even so, it mentions that at peak times and on more crowded parts of the DLR, the Train Attendant now performs duties from the front control panel to manage the increased safety risks now being experienced, but lacks the secure cab environment free from distraction by passengers, claimed from the current LU system.

The 2013 conversion of Paris line 1 is reported to have a 15 year payback period. That line has shallow twin-track cut-and-cover tunnels with short inter-station distances and mostly straight platforms. In comparison, London's deep tube lines have small single bore tunnels without walkways, and some long distances between stations. Platform layouts, heights and curves are varied with large gaps in places. This suggests the need for attended operation to assist passenger enquiries, and handling of problems, but with a train attendant less qualified than current train operators. This negates most of the staff savings from unattended operation.

The timescale for the Jubilee Line suggests that the current platform edge doors would be replaced in 20 years when new trains are due. The subsequent Comprehensive Spending Review paper has suggested new trains might arrive there in 2024-29. Platform edge doors cannot be fitted where mixed train types serve platforms, so conventional automatic operation would there remain. This includes the Uxbridge branch, the Bakerloo to Harrow and Wealdstone, the Metropolitan to Amersham and Chesham, and the District to Richmond. The timing of conversion is assumed to be 2026 for existing rolling stocks, and then 2028 for the Waterloo & City, 2032 for the Piccadilly, 2036 for the Bakerloo and finally 2040 for the Central Line as new fleets and signalling are delivered.

Full automation is assumed to slow services due to extended station stops for gap fillers to extend, platform edge doors to open and close, and gap fillers to be proven withdrawn. There will also be delays at boundary stations for train crew change and equipment reset. Reliability is expected to improve with faster schedule recovery after disruption, protected platform edges and fewer staff errors. Passengers are thought to prefer staff presence on train, level access, platform edge doors and security surveillance. Safety and security would be improved by better lineside fencing, level access and platform edge doors.