



TfL Corporate Archives Research Guides

Research Guide No 29: Brief History of the Waterloo & City Line

The London & South Western Railway (L&SWR) reached Waterloo in 1848 and there followed a number of abortive plans to extend services further eastwards. One, promoted in 1864, was to construct a tube railway - The Whitehall & Waterloo Railway - using air pressure to propel the trains. Construction work commenced but was abandoned due to lack of capital. Other proposals included a railway on viaduct and a suggestion was made that suitable tunnels be dug so as to take full-sized trains beyond Waterloo, which would have been prohibitively expensive.

In 1891 the Corporation of the City of London made a statistical survey which revealed that around 37,700 persons resided in the City, which increased some tenfold during the day with office workers. About 50,000 persons arrived at Waterloo daily, of whom 12,000 proceeded to the City by horse-bus or other means.

In November 1891, a Bill was deposited before Parliament for the construction of an underground electric railway, using tube-sized trains, from Waterloo to Mansion House. This was supported by the L&SWR but remained independent. It was to be mainly a twin-bored tunnel using the Greathead system of excavation with cast iron segment lining.

Having received Royal Assent in July 1893, the contract was awarded to John Mowlem & Co Ltd for the sum of £229,064. Work commenced in June 1894 with the construction of staging near Blackfriars Bridge, where excavated spoil was removed. The total length of the line was 1 mile 1012 yards (2535 metres) with the line being 23ft (7 metres) below the bed of the River Thames. At Waterloo, the 2-platform station, reversing sidings and signal box were located beneath the main-line station. Standard track gauge was used: 4ft 8.5in (1435mm) with a central conductor rail.

The only other station was City (renamed 'Bank' in October 1940), located close to the Mansion House. A new network of subways was built at the Bank intersection, both for pedestrian use and to serve the newly extended City & South London Railway

(C&SLR) and new Central London Railway (1900) stations, both of which, confusingly, referred to the new station as 'Bank'. Bodies for the rolling stock were built by the Jackson & Sharp Co. of Wilmington, Delaware, USA and shipped in kit form via Southampton to Eastleigh (L&SWR) works for assembly and bogie construction.

The line was opened with due ceremony in August 1898, being only the second electric tube railway in London after the C&SLR. Fares were 2d each way, with through fares and season tickets being available from the outset. Turnstiles originally installed were soon abolished and tickets issued on-train by the conductor. Trains worked 'up' to City (as a continuation of the main line) and 'down' to Waterloo.

To provide electric current for the line, a coal-fired power station was erected at Waterloo. Being physically unconnected to the rest of the railway system, access to the line was by the hydraulically powered Armstrong Lift (named after the makers and installed in 1898), which was located on the 'Windsor' side of Waterloo mainline station. Each lift platform was long enough to accommodate one coach. Another smaller lift was also built at Waterloo to hoist the coal wagons which fed the boilers to provide power for the line and also remove ash.

Originally there were 11 motor cars and 11 trailer cars, producing five 4-car trains with spares. Each train had a crew of 6, consisting of driver, driver's assistant (later abolished), guard and 3 gatemen. Five new motor cars were ordered in 1899 in order to meet demand.

The Waterloo & City Railway Co. was absorbed by the L&SWR (which had worked the line from the outset) as from January 1907.

Passenger access to the platforms at City (Bank) was by a lengthy sloping subway, the appearance of which, seemingly, gave the railway its nickname of 'The Drain'. Operating voltage on the line was increased to 600V in 1917 from the original nominal voltage of 500V, and with power now being obtained from the LSWR power station at Wimbledon the Waterloo installation closed down. Additional rolling stock (four trailer cars) was built at Eastleigh in 1921 to the original specification, in order to augment trains during the rush hours. Until replacement in 1940, the service was worked with five 5-car sets, with two motor-cars spare. Single cars were used in off-peak hours.

The L&SWR became part of the newly-formed Southern Railway (SR) in 1923. In 1934 the newly-formed London Passenger Transport Board proposed that an intermediate station be built at Blackfriars and that the line be extended to Liverpool Street thence to Shoreditch and over the East London Line but nothing came of the plans.

Following a review by the SR, it was decided to re-equip and re-signal the line. A contract was placed with English Electric for the construction of new rolling stock to be built at the Dick, Kerr works at Preston, Lancs. The new cars (12 motors and 16 trailers) were of a modern Art Deco appearance and were to be worked in 5-car formations. Being double-ended, each motor-car could be worked singly in off-peak hours. The third rail was moved to the conventional position outside the running rails. The line re-opened in October 1940 after a weekend closure and City station was

renamed Bank. On-train conductors were no longer used, ticket machines instead being installed at the stations. Through ticketing from the main line continued as before. The old stock was removed by use of the Armstrong lift.

In 1948 a further change of ownership followed with railway nationalisation and the formation of British Railways, under which the line was now operated by the Southern Region.

Access at the Bank end remained via the long sloping subway but the authorities were considering the installation of a passenger conveyor. Eventually a contract was placed with Waygood Otis for the construction of two parallel Trav-o-lators (their trade-name, by which they were originally known), moving pavements 303ft (92m) in length laid on a gentle 1 in 7 (about 14%) gradient. These were installed and opened by the Lord Mayor of London in September 1960, the first such installation in the UK. Much later these were replaced by the current CNIM machines.

The 1940 stock soldiered on, being repainted in the red, white and blue livery of the newly formed Network Southeast (NSE) sector formed in 1986, prior to privatisation. The old stock was finally replaced in May 1993 by a fleet of cars built to a modified design from an order of new London Underground stock built for the Central line and the line was converted to 4th rail operation. Five 4-car units were supplied, each train being one-person-operated.

The Armstrong Lift (for which the new stock was too long anyway) had to be removed to make way for the new Eurostar terminal for Channel Tunnel trains and instead a new shaft was dug on the south side of Waterloo station and the old stock removed by road crane. This is now the method now used to remove rolling stock for heavy maintenance.

NSE operation of the line was short-lived, for as from April 1994 the whole line, rolling stock and staff was transferred to London Underground Ltd for a nominal sum of £1.

Files of interest in the Archives include the following:

Reference Number	Content
LT000559/050	1904 Memorandum of Agreement between United Electric Railways of London and the LSWR regarding daily supply of electricity to the Waterloo & City (W&C)
LT001355/006	Report of the London County Council 1906-7 (p280) refers to the issue of early morning Workmen's tickets on the line
LT000368/064	Correspondence and minutes relating to the installation of ticket-issuing and change-giving machines at Waterloo by the LPTB in 1938 and associated charges to the Southern Railway
LT000254/1676	Comprehensive history of the W&C, with additional technical information
LT001942/001/016	Material relating to a proposed connection with the W&C and the Central London Railway, 1934
LT000486/050	Correspondence with the Southern Railway regarding a possible connection between the W&C, the Central London Railway and other tube lines and material relating to the possible installation of escalators at the City end. Also plans for wartime flood prevention, 1943
LT000273/095	Material concerning plans for a possible connection between the Northern line and the W&C, suggested improvements to passenger access at Bank and replacement rolling stock, 1938-41
LT000232/126	Proposal to transfer responsibility of the line to London Transport in 1948
LT000234/040	Sketches for new rolling stock, 1940-43
LT000766/004	Papers relating to a proposed transfer from BR to London Transport and copies of a Railway Magazine article regarding various aspects of the line, 1958
LT000044/097	Material relating to the provision of the Trav-o-lator and other improvements at Bank station

Reference Number	Content
LT000261/772	Requisition for the sale of Central line Underground stock to BR for the W&C, 1990
LT000568/002	Reports, memoranda and other papers regarding BR privatisation and references to the possible transfer of assets to London Underground, including the Waterloo & City line
LT000224/001	Information sheets on Underground rolling stock, including 1992 Waterloo & City stock, with technical details and a photograph
LT001950/011	Minutes of Waterloo Project Co-ordination meetings covering sundry matters including communications equipment, fire alarms and signage, 1994