



## TfL Corporate Archives Research Guides

### Research Guide No 16: A Brief History of the Central Line

The Central line has the distinction of enabling the longest scheduled journey without changing (West Ruislip to Epping, 34 miles). It opened in 1900 as the Central London Railway, between Shepherds Bush and Bank, and received most of its extensions shortly after the Second World War. In the early 1990s, the line was resignalled and received new trains and automatic driving, retaining the train operator for door control and emergencies.

This research guide is intended as an introduction to the story of the development of the Central Line. At the end of the guide, references are given to major primary sources contained within the Corporate Archives, but this list is not necessarily exhaustive so please do contact us if you have a more specific enquiry

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## Authorisation and Construction

A Bill authorising construction of the Central London Railway (CLR) received Royal Assent in 1891, despite considerable opposition from vested interests. After an earlier failed attempt, a leader in the *Railway Times* of 19 July, 1890, commented as follows: “Faddism, aided by personal interest, has, for the time being at least, succeeded in shelving a scheme which, if carried out, would have been of immense convenience to the busy population of the metropolis.”

As a the third deep tube railway in London, the CLR took much from the success of the pioneering City and South London Railway (C&SLR), which opened in 1890; however, it was on an altogether larger scale. It was supplied by its own generating station at Wood Lane, which could produce up to 8.95 megawatts, thirteen times the output of the power station at Stockwell for the C&SLR. Trains of seven carriages were planned, rather than the three on City and South London. For this purpose it was originally intended to have a locomotive at each end of the train, in order to avoid coupling and uncoupling at termini. Both would be controlled by the driver at the leading end. However, with the technology of the day, this could only be done by running power cables through the train, which the Board of Trade refused to sanction as a potential fire risk.

A single large locomotive had therefore to provide all the power for each train. This had motors mounted directly on each of its four axles however at 44 tons, it was four times the weight of a C&SLR locomotive, and three quarters of this weight was unsprung.

The operation of each train required eight staff. There were two men on each locomotive, and access to each carriage was via collapsible steel gates, controlled by four gatemen. In addition, there were front and rear guards. Starting from each station involved each gateman holding out their hand when their gate was closed, the front and rear guards showing a green light to each other, and then to the locomotive crew.

Working conditions were demanding – staff worked 10 hour shifts, without a meal break, six days per week, plus a proportion of Sundays, for which overtime at time and a quarter was paid.

Like the C&SLR, the signalling was of the traditional mechanical type, which required a signalman at each station (and two at Post Office (now St Paul’s), Chancery Lane and Notting Hill Gate, where



A contemporary commercial postcard showing the CLR station at Notting Hill Gate. The rear horse-drawn bus (to Liverpool Street) is of interest in illustrating the main form of competition.  
*M.A.C.Horne collection*

the platforms were on different levels).

After a formal opening by the Prince of Wales on 27 June 1900, and the running of a 'ghost' service for three weeks, the line was opened to the public on 30 July. The line was immediately popular, with 90,000 passengers travelling on each of the first four days.

The decision to charge a flat fare of 2d quickly led to the nickname 'Twopenny Tube'.

## **Vibration**

Shortly after opening, complaints were received from buildings along the line of route regarding vibration. The Board of Trade set up a committee to investigate. The cause was quickly established as the locomotives, with their unsprung weight, combined with a less than resilient (bridge) type of running rail, laid on longitudinal sleepers. The CLR co-operated fully with the enquiry and converted three of the locomotives to geared machines, using smaller, higher speed motors. This brought the overall weight down to 31 tons, and the unsprung weight to 10 tons. The company also converted four trailer cars into motor cars, using the recently developed concept of multiple unit operation, where one driver could control several motors remotely via electrically operated switches. This had been developed by Frank Sprague, who had supplied 48 electrically operated lifts to the company, and overcame the objections of the Board of Trade, as the control wires needed to run through the train were of low power.

The geared locomotives were found to reduce vibration by 70%, but the converted motor cars achieved an 80% reduction. Shortly after the Board of Trade report was produced, the company ordered a total of 64 new motor cars. These were quickly produced, and the changeover to multiple unit operation took just two months, completing in June 1903. Apart from two used for shunting duties at Wood Lane and two sold to the Metropolitan Railway in 1905 for experimental purposes, the remainder of the fleet of 28 locomotives was dismantled.

## **Early Changes**

From 1902 -05, passenger traffic was steady at 45 million passengers per year. In 1906, competition from the motor bus and the recently electrified Circle line caused a dip to 43 million, and to 37 million a year later. This prompted the introduction of 3d fares for journeys of eight stations or more, but the name 'Twopenny Tube' stuck for years to come.

The first extension to the line consisted of an additional track west of Shepherds Bush and a station at Wood Lane, where the trains were maintained. This opened in May 1908, in time for the Franco-British Exhibition at White City, and formed a complete loop at the west end of the line. The depot arrangements were cramped, and to fit the station in, one of the platforms was moveable. The end had to be rotated clear before trains could be signalled to or from the depot: this was achieved by power operation from the signal cabin, with a fully interlocked lever.

In 1912, the line was extended half a mile from Bank to Liverpool St. The latter station was the first to be designed for escalators on opening, and not long after the very first escalators at Earls Court in 1911.

## **Underground Electric Railways of London**

In 1910, the Charing Cross, Euston and Hampstead railway, with the Piccadilly and Bakerloo lines became part of the Underground Electric Railways of London (UERL). UERL took control of the City and South London and Central London Railways in 1913.

In 1920, the line was extended to Ealing Broadway, with an intermediate station at East Acton. As the tracks crossed over one another west of Shepherds Bush, they were crossed back again east of East Acton. Two further intermediate stations, North Acton and West Acton, were opened in 1923. The 1920s also saw improvements at several central area stations, with escalators introduced to replace lifts. In 1928, the line's own power station at Wood Lane was closed and power obtained instead from the Underground power station at Lots Road.

The absence of a convenient interchange with the Piccadilly line was addressed by the opening of a new station at Holborn in September 1933 and the simultaneous closure of British Museum, 100 metres to the west.

## **London Passenger Transport Board**

The London Passenger Transport Board took control of all tube and subsurface lines in 1933. Around this time, major extensions of the Central line were announced as part of the 1935-40 New Works Programme. These were to Denham in the west and to Ongar in the east, and would bring significantly increased numbers passengers to the central area. Station platforms were therefore lengthened from 99 to 130 metres and the running tunnels were straightened and enlarged to take standard size trains. The third rail power supply was changed to the London Transport fourth rail system, and the bridge type running rails and longitudinal sleepers were removed and replaced by standard components.

## **The Second World War**

Although it had been planned to open the extensions in the early 1940s, the Second World War imposed new priorities. Unfinished tunnels were used as air raid shelters, and a factory making military components was installed in 4 km of tunnels between Wanstead and Gant Hill.

The worst disaster in any tube station happened at the unopened Bethnal Green, which was being used as an air raid shelter. A crowd entering the station after an air raid warning pushed over a woman and child, who had tripped on a staircase. Those following pushed harder and fell on top of those in front, resulting in 173 fatalities.

Swift measures were taken to improve lighting, and to fit central handrails and crash barriers as a result.

## Post War Expansion

The extensions in the east opened in stages between 1946 and 1949. However, most of the stations had been opened from 1856, and the extension was largely the electrification and signalling of an existing main line railway. The only entirely new stations were Bethnal Green, Mile End, Wanstead, Redbridge and Gants Hill. A major train maintenance depot at Hainault was also part of these works.

In the west, the line was also extended in stages, between 1947 and 1948, as far as West Ruislip, which had a second major train depot. The opening of a new station at White City in 1947 allowed Wood Lane station (with its restrictive platform layout) to be closed.

Together with higher capacity signalling installed in the central area in 1940, the



Although other forms of motive power were examined (and tested), steam locomotives were the mainstay of the Epping–Ongar shuttle service until electrification. This view shows the push-pull shuttle train in the charge of an F5 class tank locomotive in 1956, amid the rural setting of the branch. The conductor rails, laid before electrification was halted in 1940, can also be seen.

*R. C. Riley*

Central line was effectively transformed into a major line. The only section that seemed a little out of place was the very rural single line section between Epping and Ongar. This was operated by a steam hauled shuttle train until 1957. Very lightly used, the closure of the passing loop at North Weald limited the service to a train every 40 minutes. The closure of Blake Hall

followed in 1982, and the section beyond Epping in 1994.

## Modernisation

By the early 1990s, the trains and signalling were 30 - 50 years old. A major modernization took place between 1992 and 1995. A total of 85 trains were ordered and were able to operate automatically between stations - the first line to do so since the Victoria line in 1968.

## Key Primary Sources

Reference	Dates	Description
LT000232/123	(1948-1959)	Epping-Ongar Line

LT000294/108-113	(1971-1989)	Central Line: Epping-Ongar Line
LT000341/203	(1943)	Bethnal Green: Papers concerning air raid alert notices, the Bethnal Green Station disaster - correspondence and reaction, list of shelter stations, and numbers at stations between 3 and 4 March 1943
LT000449/032	(1900 – 1913)	Register of booking clerks
LT 000449/095	(1895 – 1912)	Register of salaried staff
LT000460/281	(1969-1972)	Epping to Ongar Closure
LT000660/058	(1976)	Epping-Ongar Line
LT000683/121	(1891)	Central London Railway Act 1891 (Ch. 196)
LT000683/122	(1892)	Central London Railway Act 1892 (Ch. 241)
LT000683/123	(1894)	Central London Railway Act 1894 (Ch. 57)
LT000683/124	(1900)	Central London Railway Act 1900 (Ch. 37)
LT000727/217	(1907)	Central London Railway diagram plan
LT001893/003	(1987)	The Central Line: A Short History: Publication By M. Horne
LT001893/004	(1970)	Seventy Years of the Central: Publication by Charles Lee
LT001893/027	(1946)	Central Line Extension: Publication concerning the development of the Central Line from Liverpool Street to Stratford
LT001893/028	(1948)	Central Line Extensions: Publication concerning the development of Central Line stations in east and north-east London planned as part of the 1935/40 New Works Programme
LT001905	(1937-1999)	Central Line Structural Inspection Reports

If you would like to view any of the papers listed above or would like any further information please contact the Corporate Archives team at [corporatearchives@tfl.gov.uk](mailto:corporatearchives@tfl.gov.uk)

For further reading please see:

The Central London Railway, BG Wilson and V Stewart Haram, Fairseat Press Limited, 1950.

The Central Line, A Brief History, Charles E Lee, London Transport, undated, ISBN 0 85329 055 5.

The Twopenny Tube, J Graeme Bruce and Desmond F Croome, Capital Transport, 1996, ISBN 185414 186 4.

The Central Line, A Short History, MAC Horne, Douglas Rose, 1987, ISBN 1 870354 01X.

London Underground – A Diagrammatic History, Douglas Rose, 1980, Published by Douglas Rose, 35 Summers Lane, North Finchley, London N12 0PE, ISBN 0 9507101 0 5.