



## TfL Corporate Archives Research Guides

### Research Guide No 42: Trolleybuses in London

#### Introduction

The trolleybus is an electric bus that takes its power from wires strung over the roads on which it runs. Power is collected by means of two trolley poles mounted on the bus roof, which have swivelling sprung bases to ensure the collector shoes on the ends of the poles stay in contact with the wires while the bus manoeuvres. Most London trolleybuses also had batteries, enabling them to move independently for up to half a mile in emergencies.

#### Early history

The trolleybus became a viable technology in the first decade of the 20<sup>th</sup> century, with early systems operating in Germany, Italy, France and the Austro-Hungarian Empire. The first successful systems in Britain opened in Bradford and Leeds on 24 June 1911.

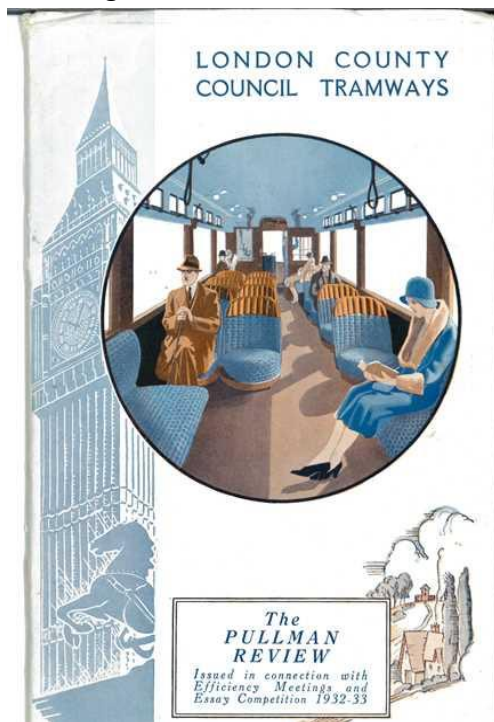
Technical demonstrations of trolleybuses took place in London in 1909 (in Hendon Tram Depot), 1912 (Greengate Street, West Ham), and 1922-3 (Haydon's Road, Wimbledon). Several proposals were made for trolleybus routes over roads with insufficient traffic to support trams, but none came to fruition. As the technology improved, trolleybuses became a direct alternative to tramways, and conversions of some British tramway systems to trolleybuses began in the late 1920s.

London United Tramways (LUT), a subsidiary of the Underground Group, opened the first public trolleybus service in London on 16 May 1931. Over the next four months, the LUT created a network of 5 routes run with 60 vehicles in the area between Wimbledon, Kingston, Twickenham, Tolworth and Hampton Court. The LUT's trolleybuses replaced obsolete trams running over life-expired tracks, reducing costs and generating considerable extra traffic and income. Two minor extensions were made before the London Passenger Transport Board (LPTB) took over in 1933.

The Archive has no original records relating to this period; these are held by the London Transport Museum and the London Metropolitan Archive.

### The network develops

The LPTB inherited from its predecessors (London County Council Tramways [LCCT], eight other municipal operators, and three companies owned by the Underground Group) a very large tramway network, which suffered from obsolescence and was expensive to run. Public sentiment was largely against trams, which were thought to cause congestion and were regarded as 'old fashioned'. Motor buses were developing, but they had a lower



passenger capacity than most London trams; there were also issues of staff costs (staff on red buses earned more than tramwaymen, and had better conditions of service). Trams also had a different fare structure, including widespread arrangements for transfers between routes without paying a further fare, 'all day' tickets and 'workman' tickets at reduced fares. Much of the tramway electrical infrastructure – power stations, substations and high-tension supply cables – had a good life remaining, and high costs would be incurred in writing-off these assets prematurely. The LPTB therefore decided to replace its tramways with trolleybuses; the work was initially expected to be completed in 1943. Authority for conversion was obtained through annual LPTB Acts of Parliament, since the legislation concerning trolleybus operation was similar to that for tramways. The

LT000246/005/001

project was financed as part of the LPTB New Works Programme, which also covered Underground modernisation and expansion.

Conversions started in 1935 and proceeded very quickly, until wartime conditions brought a halt in 1940. At that point all trams had been removed from East, West and North London, save for three routes that ran through the Kingsway Tram Subway. London's trolleybus network was the largest in the world at the time, with 1764 trolleybuses and 225 route miles.

Generally, trolleybuses only served roads previously served by trams, so there was virtually no operation in Central London. There were however some valuable new local links created, including connections in the Walthamstow area and across the Lea Valley, and a major extension from Canning Town to North Woolwich.

The overhead wires and supporting poles could be controversial when trolleybuses were introduced, as on most LCCT routes power had been collected through a slot between the rails and wires had not been needed. Trolleybus conversion had a marked effect on the local landscape which led to considerable opposition to London Transport's plans,

particularly for trolleybus termini on the fringes of Central London and led to some turning points being sited back from the obvious traffic objectives.

Files of interest in the Archive include the following:

ArchiveRefNum	Content
LT000705/036/001	Report of visit to United States by TE Thomas and GF Sinclair; includes observations on trolleybus operations and technical practice in several cities, 1934
LT000484/016/001	Copy of the LPTB Bill for the 1934-5 Parliamentary Session which includes extensive provisions for converting specific tramway lines to trolleybus operation, 1935
LT000490/016	Chairman's file on general trolleybus matters. Includes report of Ministry of Transport inspection of new Trolleybus overhead from Aldgate to Amherst Park, memoranda on cessation of tram services in Dartford (Wilmington) and Alexandra Park without trolleybus replacement and memorandum regarding not using a "T" prefix to Trolleybus route numbers, 1934-1939
LT000548/001, LT000548/003 & LT000606 Series	Minutes of Deputy Chairman's Traffic Committee. These contain many references to policy, planning and implementation of tram to trolleybus conversion schemes, including consequential changes to motor bus services, 1935 - 1940
LT000694/1065	Correspondence, memoranda, drafts of evidence, draft clauses and minutes of meetings regarding the LPTB Bill for the 1938-1939 Parliamentary Session. Subjects include trolleybus routes and turning facilities in the Borough High Street and Southwark Bridge Road areas, at Peckham Rye, and on the Victoria Embankment, 1938
LT000694/374	Drawings prepared for the LPTB 1937 Bill showing roads proposed to be used (including possible alternatives) to turn trolleybuses at various locations including Beaufort St Chelsea, Borough High Street, Westminster Bridge Road, and Victoria, 1937
LT000694/546	Correspondence, memoranda, draft clauses, drawings and plans concerning communications with the London County Council regarding the LPTB Bill and the London County Council (General Powers) Bill in the 1936-1937 Parliamentary session. Matters covered include acquisition of land for trolleybus turning circles, and potentially weak bridges and pedestrian subways over which trolleybuses would run. Includes a general arrangement drawing of a typical trolleybus electrical substation, 1936-1937
LT000234/172	Statement of estimated financial results (passenger takings and working expenses) following tram to trolleybus conversions, prepared by the LPTB Chief Accountant, 1939

ArchiveRefNum	Content
LT000490/010	Memoranda relating to a report to the Post War Planning Committee on completion of the tram to trolleybus conversion programme. Subjects include the economics of conversion (including possibility of converting some motor bus routes to trolleybuses); suggested improvements to vehicle design; and power supply issues. The file also contain some extracts from pre-war planning reports, 1939-1943

### Operations

Between 1933 and 1950, trolleybuses were the responsibility of London Transport's Tram and Trolleybus Department which was entirely different to the Central Bus Department. It had its own management and supervision structure, staff pay and conditions, operating procedures and practices, fares and ticketing arrangements, premises, engineering and other features. Many of the senior personnel came from the LCCT and the Underground owned companies. In 1950, the Tram and Trolleybus organisation was subsumed into the Central Buses organisation in preparation for withdrawal of trams.

Files of interest in the Archive include the following:



LT001939/012

ArchiveRefNum	Content
LT000503/034	Analysis of the different scheduling conditions and related payments applying to Central Bus, Tram and Trolleybus, and Country Buses and Coaches drivers and conductors, 1942
LT000233/552	Correspondence and statistics regarding wages, conditions of employment and utilisation of tram and trolleybus drivers and conductors, 1936
LT000233/550	Statements comparing the conditions of employment of London Tram and Trolleybus men with other operators, and internally at different dates at Bexley and Sutton depots. 1936
LT000104/036	Annual Report of the Chief Welfare Officer for 1936-1937; includes photographs of new facilities at Hanwell and Stonebridge Park depots, 1 Oct 1937

ArchiveRefNum	Content
LT001121/001, LT001121/002 & LT1121/003	Minutes of meetings between senior managers and the Trolleybus Traffic Staff Negotiating Committee and Trade Union officers, covering issues regarding operation of trolleybus services from the viewpoint of drivers and conductors. Also includes issues arising from tram to trolleybus conversions and trolleybus to motor bus conversions, 1938-1959
LT000353/024 & LT000353/027 & LT000353/028	Drafts and final versions of Post-War Planning Committee report on simplification of the ticket system for road transport. Includes summaries of bus, trolleybus and tram ticketing systems and assessments of alternatives. Contains photographs of equipment, sample tickets, statistical information and cost estimates, 1943-44
LT001208/172	Weekly record of trolleybus passenger takings, passenger journeys and service miles, and private hire mileage and receipts, 1955-1961
LT001208/175	Weekly record of service miles, empty car miles and private hire miles run by each tram and trolleybus depot, 1939-1959
LT000490/001	Chairman's file of correspondence and statistics regarding the financial aspects of trams and trolleybuses, 1940-1946
LT000490/008	Chairman's file of replies to public complaints about trolleybus services, 1945-1946
LT000798/011	Includes official reports on trolleybus accidents involving personal injuries and deaths; also some press reports on these accidents, 1940-1941
LT001391/001	Trolleybus staff accident record book. Includes brief details of incident and injuries sustained, 1939-1941
LT000798/025	Includes records of accidents to passengers and pedestrians involving trolleybuses, 1943
LT000490/012	Trolleybus fatal accident reports. Certain restrictions apply to access to this file as it contains personal data, 1947
LT000044/041	Press Office file on trolleybuses containing answers to correspondents' questions on trolleybus services, the network and vehicles. Topics include technical specifications; maintenance arrangements; the trolleybus conversion programme; vehicle withdrawal dates and preserved trolleybus 1348 which went to Ireland. The file includes some photographs, 1961-1977

## Vehicles

A total of 1891 trolleybuses were owned by London Transport, though not all were in service at the same time.

LUT's first 60 trolleybuses were 56-seat 3-axle double-deckers of archaic design, including a half-width driving cab with the motor and control equipment alongside in the position where the engine would be in a motor bus. For reasons now uncertain, they were nicknamed 'Diddlers' by passengers and staff.

Most other London trolleybuses were 70-seat double-deckers with three axles, 30 feet long and 7ft 6 ins wide, with metal rear-entrance bodies built to a distinctive “house style” which looked more modern than contemporary motor buses. There were also some 26-foot long 60-seaters for use on less busy routes and those with tight corners to negotiate.

Some experimental buses were built, and the most significant was development of a vehicle with an integral chassis and body. This structure was more robust, saved weight and reduced height, and resulted in more than 200 similar buses being built. This experience contributed to the design of the ‘Routemaster’.

43 vehicles built for Durban and Cape Town were delivered to London during the war because export shipping capacity was not available. They were London’s first 8-foot wide buses, and were restricted to operating in the quieter Ilford area because of Police concerns over the extra width. Before they arrived, some trolleybuses were hired from Bournemouth Corporation to cover for war damage, which also resulted in a significant number of standard bodies being written-off and replaced.

Between 1948 and 1952, 127 new trolleybuses were purchased, to replace the ‘Diddlers’ and some other worn-out vehicles. They were built to the London Transport specification, but were 8-feet wide. In 1960, these buses were withdrawn and all but two were sold to operators in Spain, where some lasted until 1979.

Files of interest in the Archive include the following:

ArchiveRefNum	Content
LT000246/011	Draft article on the development of London trolleybuses by Mr Anthony Bentall, who retired as Technical Officer (Trams and Trolleybuses) in 1950, for publication in the "London Transport Magazine," 1951
LT000246/042	File of papers on tram and trolleybus electrical and other equipment, assembled by Mr Anthony Bentall when Senior Technical Assistant. Mr Bentall was noted as being largely responsible for the design and construction of London's Trolleybus fleet, 1908-1950
LT000345/116	Brief details of every trolleybus bought by London Transport, including class code, registration number, chassis and body manufacturer, month and year into service, depot at time of withdrawal, details of official withdrawal paperwork, date of sale and purchaser, 1935-1962
LT001245/040	Papers relating to licensing of a patent for a "Chassisless Trolleybus" to the English Electric Company Ltd, 1938
LT000559/007	Formal Ministry of Transport approval for the design of a chassisless trolleybus produced by Leyland Motors, 1939

ArchiveRefNum	Content
LT000490/004	Chairman's file of memoranda and correspondence regarding trolleybus rolling stock including correspondence about acceptance of 43 8-foot wide buses built for South African operators; post-war purchases; and a report on experience with the construction and maintenance of chassisless and 'unit construction' vehicles, 1940-1946
LT000315 Series	Reports of technical trials and experiments carried out by LPTB Road Services and its predecessors and successors. Includes a number of trolleybus items, especially LT000315/9826 - report on the future policy on repairs to trolleybuses; includes analysis of the present condition of particular trolleybus types and a proposed withdrawal programme for the fleet during the conversion period, 1953
LT002010/002/001-045	Reports on experiments, trials and modifications carried out on trolleybus equipment, 1950-1959
LT000353/002	Report of acceleration tests comparing trolleybuses and 'RT'-type motor buses, 1946
LT001788/1	Minutes of the Tram and Trolleybus Main Technical Committee, covering modifications, trials, investigations, failures and other issues concerning these vehicles, 1947
LT001208/009 & LT001208/010	Correspondence, reports, drawings and photographs concerning miscellaneous trolleybus technical matters, particularly regarding investigations into equipment failures. 1948-1949
LT001384/035	Correspondence on proposals to reduce the number of internal and external notices and markings on buses and trolleybuses. Also extracts of report of committee on this subject which includes photographs, 1949-1952
LT000233/148	Reports on tram and trolleybus maintenance costs and quantities, and papers seeking authority to buy replacements for trolleybus bodies destroyed during World War 2. Also a printed and bound copy of a paper entitled "The Trolleybus" submitted to the Institution of Electrical Engineers by GF Sinclair, 1940-1947
LT000852/014 & LT000852/015 & LT000852/028-035	Records and correspondence relating to sale of vehicles and spare parts to Spanish trolleybus operators, 1961-1962

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