

London's Railways—Their Contribution to Solving the Problem of Growth and Expansion

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Capital cities are usually the most populous urban centres in a country. They are also likely to be the largest in geographical area and hence transport problems are liable to occur first and to a larger extent in capitals than in any other towns. London in the nineteenth century fitted this model. It was by far the most populous city in Great Britain and its population grew by about 20% every decade, from about 1 million in 1801 to 4 million in 1871 and over 7 million just before WWI¹. So although London was much smaller than Tokyo at the beginning of the nineteenth century, in later years, London was the larger city². As London's population grew, so did the geographical extent of the capital from about 25 square miles in the 1840s to over 100 square miles in 1900³. With this growth in population and area, it is not surprising that many of Britain's transport problems appeared first and most acutely in London. Unlike much of the UK's rail network, London's railways were subject to government planning, even if this was more negative than positive in character⁴.

The Nineteenth Century

In the early nineteenth century, London was still emphatically a walking city. It was small enough in extent for nowhere to be more than a few miles from the centre. People lived close to, or even over, their workplace because working hours were long, wages were low and there was no cheap mass travel. The aristocracy had private carriages, the gentry and merchants could afford hackney carriages, and the middling classes rode horse-drawn omnibuses, but the workers walked.

London's first railway was the London & Greenwich, from London Bridge (opened in 1836) to Greenwich (opened in 1838), only a few miles to the south-east⁵. The early railways in London, especially to the

south and east, catered for short-distance traffic but they were soon followed by the termini for long-distance lines, such as Euston in 1837 for the north and west, and Paddington a year later for the west via Reading, Swindon and Bristol. These latter railways had little impact on mass intra-urban travel. Their fares were too high and they did not really cater for short-distance commuters, being more interested in long-distance, inter-city movement.

Indeed, in many ways the building of railways added to urban congestion rather than easing it, because the railway tracks, stations, goods yards and associated buildings, such as hotels and offices all occupied a considerable acreage of urban land, and the railway companies became among the largest urban land owners. The land they needed was mostly in areas of cheap, working-class slum housing. This made sense for the railways because it was cheaper than fashionable areas, caused less outcry because the inhabitants had no voting rights before 1868, and allowed the railways to claim that they were providing a social service by clearing out unhealthy over-crowded localities.

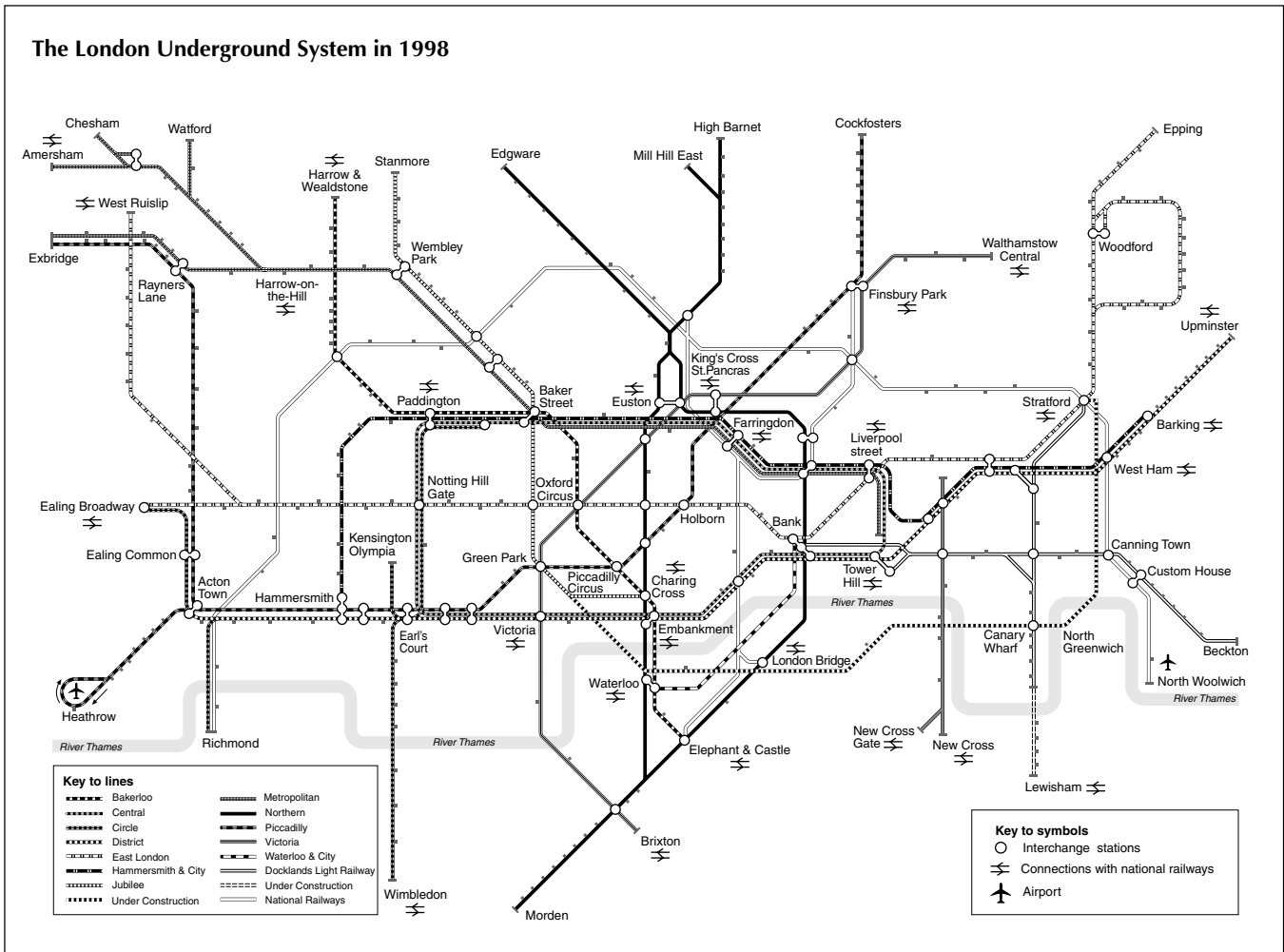
There was some truth to this claim, but what of the displaced inhabitants? Their numbers were considerable. Dyos estimated that 76,000 people were displaced between 1853 and 1901 by railway schemes in London⁶. Because these people were mostly poor and worked long hours for low wages, they could afford neither the time nor the money to move very far from their place of work. Consequently, when their existing dwellings were demolished, they moved into nearby accommodation, worsening the overcrowding.

Thus, the construction of the railways in London initially aggravated the housing situation rather than improved it. By contrast, the City of London Corporation opposed the penetration of railways into the City. The Eastern Counties Railway was halted at Shoreditch (later Bishopsgate), and the London & Southampton at Nine Elms. The only exception was the London & Blackwall, which was allowed (at the second attempt) to run into a terminus at Fenchurch Street⁷. Much of the later expense of building railways in London was incurred by extensions to more convenient termini, such as Waterloo in 1848, Victoria



Old steam loco of Metropolitan Railway (built in 1866 by Beyer, Peacock & Co.) with smoke and steam recycling apparatus, preserved at London Transport Museum (EJRCF)

The London Underground System in 1998



(Adapted from London Regional Transport materials)

in 1860, Charing Cross in 1864, and Liverpool Street in 1874⁸.

For similar reasons, the Royal Commission on Metropolis Railway Termini of 1846 examined and rejected the idea of one or two large termini in central London, into which all lines of the railway companies would converge. Furthermore, they also rejected the idea of allowing overground railways into central London at all, with one or two later exceptions. Hence there came to be a multiplicity of stations forming a parallelogram around central London⁹. This was quite different from the central Tokyo Station, the Union stations in many big American cities, and the *Hauptbahnhof* of German cities. Instead of having one hub, London had fifteen terminals¹⁰. This policy of diffusion required a means of linking these multiple

terminals, which gave rise later to a mix of overground and underground tracks. There were one or two minor exceptions to the rule of excluding railways from central London, such as the Victoria and Charing Cross stations mentioned above, and the Blackfriars to Farringdon Street line, which became important much later when it formed the essential north-south link (see below).

Because they had the money and greater time flexibility, commuting to the suburbs began with the middle classes. They could afford the high train fares to Harrow or Ealing, were likely to start work later and spend fewer hours in the office. Consequently, in the middle of the nineteenth century, white-collar city workers using either the horse-drawn omnibus, their own pony and trap if well

off, or the railway, began moving from the city centre. The advantage of the suburbs—lower rent, less-crowded conditions, less polluted air and streets—became more obvious as the centre of London became more congested and horse traffic soiled the roads. Other discomforts were the smoke from coal-burning domestic hearths and boiler chimneys, which caused lung and breathing disorders. In addition, London acted as a magnet for pickpockets, burglars, tricksters and other undesirables, so the suburbs looked attractive to the 'respectable classes'.

The horse-drawn tram was a significant boost to working class mobility. By putting the carriage on steel tracks, rolling resistance was reduced and a team of horses could pull a larger vehicle than a



London Underground trains at Farringdon Station which dates back to 1863

(EJRCE)

horse-drawn omnibus. Horse trams could accommodate up to 40 passengers. There were significant capital costs in laying track, and flexibility was limited, but this horse-drawn railway, almost a harkening back to the earliest tramways, was a great step forward in mass transit. The first in London was laid in 1860 along Liverpool Road in Islington. However, there was resistance to the innovation. Horse-drawn omnibus operators opposed this competition and some local councils objected. The use of a rail flush with the road surface, rather than one that protruded, made it more acceptable to other road users, but inner London refused them as likely to increase congestion rather than relieve it.

Because above-ground congestion was so bad, with areas like London Bridge a permanent traffic jam in daylight hours, an obvious way to move people quickly was the underground railway. London was the first city in the world to have such a line, thanks to financial support from the City Corporation.

The first underground was built in 1863 from Paddington to Farringdon Street in the heart of the business district. Appropriately,

it was called the Metropolitan Railway and was built using cut-and-cover techniques following the line of roads above. Steam locomotives were the source of motive power. It was a great success, carrying over 10 million passengers in its first year¹¹, and was soon followed by extensions, which, together with the Metropolitan District Railway, formed the Inner Circle linking most of the capital's railway terminals by quick, frequent services around central London.

A number of breakthroughs in the latter half of the century began to make it possible for workers to move out of the centre of London. Some railway companies began introducing workmen's fares from the 1860s, which were cheap return tickets with the outward journey having to be made early in the morning. This step was boosted by the 1883 Cheap Trains Act that encouraged this sort of provision. As a result, outer London working-class suburbs to the east of the City, such as Enfield and Walthamstow, began to develop. The rail network by the end of the century was comparatively dense in London, particularly in the districts south of the Thames. So much

so, that Edwin Course referred to 'the Battersea Tangle' where there was such a plethora of criss-crossing railway lines serving Victoria, London Bridge, Charing Cross, etc., that districts such as Battersea, Bermondsey, Clapham and Croydon were severely dissected by railway tracks¹². By 1900, over 5% of central London's land was owned by railway companies¹³. The number of passenger journeys on London's underground and other local railways increased rapidly in the first few years of the twentieth century, rising from about 228 million in 1900, to 300 million in 1906, and over 440 million in 1913. Journeys in Greater London on *all* railways rose from about 460 million in 1900 to 725 million in 1913¹⁴.

Electrification and the Tube

Towards the end of the nineteenth century, two technological breakthroughs changed the face of London's transport system. These were electrification and the advent of underground 'tube' railways. The use of electricity was crucial to increasing the use of trams. Electric trams were faster, and could carry more people at lower cost. As a result, workers could afford a daily commute of a few miles and could join the move to the suburbs.

It was not only the trams that benefited from electric traction. So too did the underground railway. Using steam locomotives in underground railways was not an ideal solution. Steam, soot, and smuts entered the carriages and made surroundings dirty.

Electric traction obviated this and provided a much cleaner environment. Also, since ventilation was not such a problem, railway tunnels could be sunk much deeper, allowing the advent of deep tubes driven through the London clay, which was suitably strong ground. The tubes were made of cast-iron sections bolted together and the tunnels were

driven using modern mining techniques involving a shield and mobile cutting equipment. Since they were deep, they avoided all the other services, such as sewers and gas pipes, and reduced the risk of subsidence to existing property. The path-breaker was the City & South London in 1890, the first electric underground railway in the world. A number of lines were driven through that became the Piccadilly, Bakerloo and Northern lines. They provided cheap frequent and quick journeys from the inner suburbs. Initially, lifts were used to carry passengers to the deep level, but escalators followed, the first being installed in Earls Court Station on the Piccadilly Line in 1911. By WWI, London had an underground-railway mass-transit system. Adoption of system-wide ticketing and a common logo persuaded passengers to perceive it as a system rather than just individual lines, and transfers from one line to another became easier.

Electric traction was also available for the above-ground main-line railways, but was hardly adopted before WWI. Some suburban commuter lines on the London Brighton & South Coast, and London & South Western railways were electrified by 1914, but the length was small. The huge capital cost, the commitment to steam locomotive design and construction, and the ready availability of cheap coal acted as disincentives to electrification. There may well have been a failure on the part of British venture capitalists to see the potential of electric traction. Much of the money for constructing the London tubes came from American financiers, chief among whom was Charles Tyson Yerkes of Chicago. The Americans had electrified urban transit earlier than the British and had made great profits, not least from associated property development, and they hoped to be similarly successful in Britain. In fact, the large profits were rather illusory, but the Americans built a quality system that brought social gains if not private profits¹⁵.

The First World War saw a freezing of most developments in railway and urban transport but not of usage. Full employment, the massive use made of railways by the government to move troops and munitions, and lack of regular maintenance and replacement, left the physical stock of the railways in poor condition. The wartime experience of running the railway system as a whole network convinced the government that there were economies of scale to be had, and that competition between lines was largely impractical. Perhaps the effective competition of coastal ships on some routes and for some commodities before the war, and the probability of competition from motorized road transport following the improvements made during the war, combined with the government's faith in a regulatory body, convinced it that oligopoly was safe. As a result, when the government handed the railways back to private hands in 1921, it insisted on amalgamation of the hundred-plus companies into four regional groups—the Southern, the London & North Eastern, the London Midland & Scottish, and the Great Western Railways.

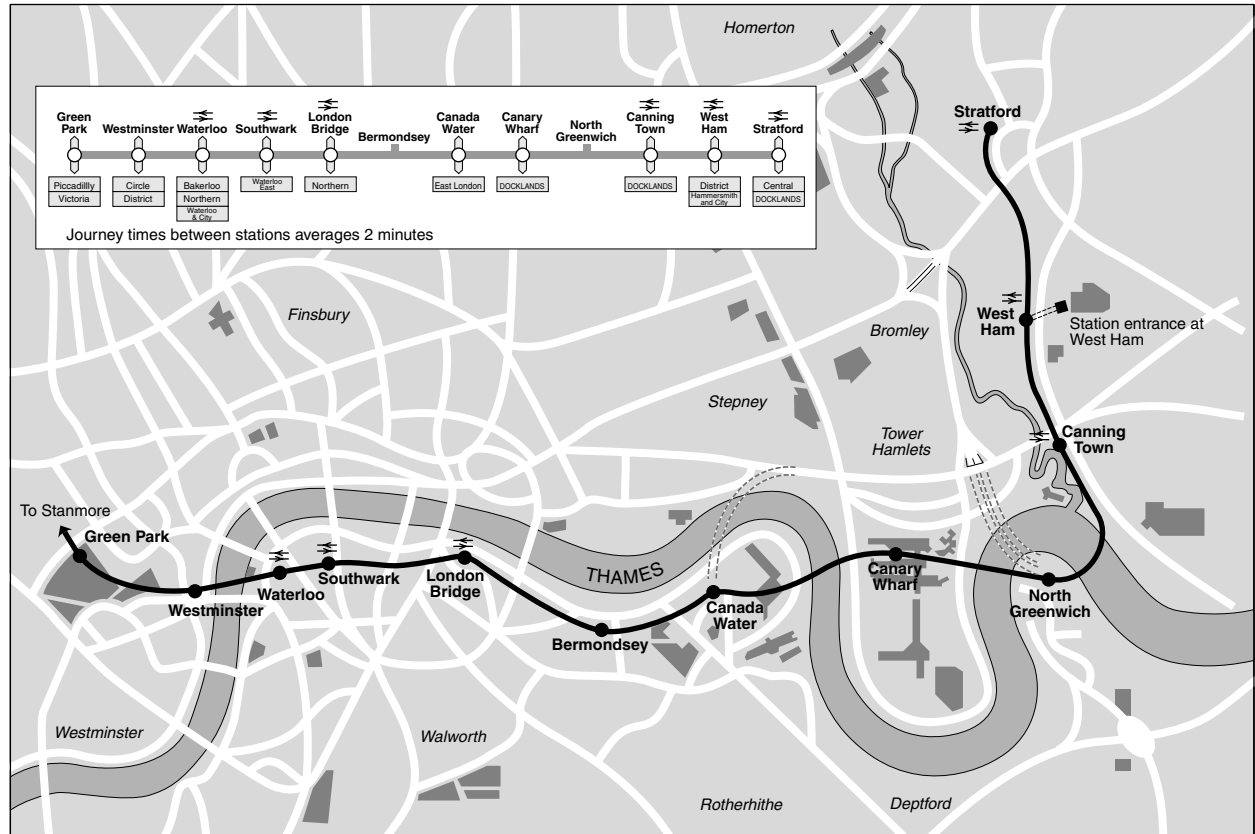
For commuters into London, perhaps the most important development on the railways in the period between the two world wars was electrification. The Southern Railway pressed ahead, electrifying about a quarter of its track mileage. It adopted electrification to take advantage of the benefits of higher speeds and reliability. The better acceleration of commuter trains making many stops was of particular importance. Electrification widened the range of locations that City or West End workers could commute to. Despite these advantages, electrification was not widely adopted by the other main-line companies, partly because of a shortage of funds for the large-scale investment, and partly because of a natural conservatism.

The Interwar Years

The interwar London streets saw the proliferation of the motor bus, at first complementing and then competing with trams. The motor bus became a large-scale people mover after reliability had been improved, and the pneumatic tyres gave a more comfortable ride. Unregulated routes and services encouraged unsafe and anti-social practices. Bus drivers were inclined to operate only in the peak hours when they could fill their buses, or raced each other to the next stop to pick up passengers. As a result of the high competition, the wages of bus workers were low and the hours long. The London Traffic Act of 1924 was an attempt to curb some of these abuses, but was only partially successful. As a result of continuing problems, the idea of coordinating all London's passenger transport gained popularity. It was believed that cooperation might be more efficient than competition.

The London Passenger Transport Board was established by an Act of Parliament in 1933 to coordinate all of London's buses, trams and tubes. It was independent—one of the first Quasi Non-Government Organizations (quango)—and non-profit making, and took over the assets of five railways, 14 tramways, and 60 bus undertakings. It was the first example in the world of such coordination, and was remarkably successful under the guidance of Lord Ashfield as Chairman and Frank Pick as Chief Executive Officer. In the late-1930s, it began extending the tubes, often above ground, as more middle-class people moved to the outer suburbs creating London urban sprawl; areas such as Ruislip, and Harrow became dormitory towns. The number of passenger journeys on all railways reflected this growth, rising from 725 million in 1913 to over 1.1 billion in 1919–20, falling back to 925 million per annum in 1923–27, and exceeding 1 billion in 1928–34¹⁶.

New Jubilee Line Extension on London Underground



(Adapted from London Regional Transport materials)

Post World War II

Like the First World War, WWII put pressure on the railways. More movement was required but other forms of transport, such as coastal shipping were very vulnerable to attack. Again, the government operated all the railways as one system. Prewar debates about the value of coordinated transport, plus wartime experience, combined with a postwar Labour government led to the nationalization of virtually all types of transport—airlines, railways, canals, buses and most road haulage—in the late-1940s. They were placed under the British Transport Commission, but a separate executive was established for London Transport. This body outlived the Labour government and managed London’s transport until 1969 when the Greater London Council took

over many of its policy-making roles. The 1950s to 1980s saw limited development of the London underground, especially compared to other capitals with greater civic pride, such as Paris and Tokyo. A new underground—the Victoria Line—was driven through from Walthamstow to Brixton. It was the first new line for over half a century. Construction began in 1963 and was completed in 1971. The justification was not narrowly financial, but was based on wider cost-benefit arguments about the value of a more comfortable journey,¹⁷ because much of the line would take traffic from heavily used existing lines. The outer ends opened up new areas to the tube system. Construction of the Jubilee Line, essentially a duplicate route from central London to the north-west suburbs, was authorized in the late 1960s on a similar basis, to take traffic from the

heavily-used Bakerloo Line between Baker Street and Charing Cross. It was opened in 1979 from Stanmore to Charing Cross and subsequent extensions were authorized to cross the Thames to help expand and revitalize the Docklands developments being encouraged by Conservative governments of the 1980s. Ironically, it was pressed forward by the champion of free-market economics, Prime Minister Margaret Thatcher, in order to revive the ailing Canary Wharf property development company, which had undertaken renovation of the docklands and needed a quick form of transport to the City. The 16-km Jubilee Line Extension was given an added urgency when the millennium showpiece—the Millennium Dome—was planned for construction on a brown-field site in North Greenwich. The line opened in stages in 1999 to ensure visitors are able to visit the millennium

celebrations. The station at North Greenwich became the first in the UK to use glass platform doors¹⁸.

Given London Transport's recruiting problems in the 1950s and 1960s, which necessitated employing workers from the Commonwealth, the logical response was a shift to personnel reductions. This was emphasized by the reduction in labour costs achieved by what became known as 'driver only operation' (DOO), eliminating conductors on buses and guards on tube trains. The Victoria Line used DOO operation right from the start of operations in 1968 (it could also run without a driver), as did the Jubilee Line a decade later. In the 1980s, older lines such as the Circle were converted to DOO by installing cameras and large monitors on stations so the driver could see the full length of the train. By then, the motive was cost reduction rather than labour recruiting difficulties.

Immediately after WWII, there was an attempt to disperse population and industry from big cities such as Birmingham and London to New Towns and depressed regions, based on the recommendations of the Barlow Commission of 1940. This was meant to have a double benefit of easing congestion and pollution in the cities and

creating employment in depressed regions. The Location of Offices Bureau established as a government agency in 1963, encouraged decentralization of both government and private offices. It used a large-scale advertising programme to press the advantages of New Towns and areas of higher unemployment. A number of government departments were moved out of central London. Some measure of its success might be seen in the decline in the 1970s when the number of commuters to London by public transport dropped from nearly 1 million a day in 1971 to just over 800,000 in 1980¹⁹. This decentralization policy was scrapped by the Thatcher government, which believed that market forces should be allowed to operate and that *dirigiste* government policies were a misallocation of resources. This put even more pressure on London's transport at a time when government was disinclined to invest public money in state-run organizations. The number of people commuting to the capital by public transport then rose to 885,000 in 1985 and 916,000 in 1990²⁰. Current economic conditions and increasing road congestion has created rising demand with the result that the existing system is now stretched to capacity.

GLC and Docklands Light Railway

One attempt to reduce the gridlock was made by the Greater London Council (GLC) in 1981 in its 'Fares Fair' policy. The GLC believed that fares were too high and were therefore encouraging use of private cars. Hence, it argued, reducing fares would encourage people to use public transport and reduce congestion. The fares were reduced on average by about 30% and 'patronage of both the underground and the buses increased dramatically'²¹. However, this innovative approach was seen as discriminatory to some London areas poorly served by public transport and was ruled illegal by the House of Lords. As a result, London Transport fares shot up in 1982 and travel fell by about 15%. In response to this setback, in 1983 the GLC introduced the Travelcard which allowed unlimited travel on both bus and underground and used zones rather than many tapering fare stages. Travelcard made travel much easier and cheaper if a number of journeys were made. In 1985, the Capital Card was introduced, allowing unlimited travel on British Rail lines within London, as well as on London Transport tubes and buses. Again, there was enthusiastic take up, and in the mid- and late-1980s, tube and rail usage increased, which was ironic when government policy did not favour public transport.

Another irony of the Thatcher-government years was the Docklands Light Railway. The government was very committed to redeveloping the London docks area, which had been largely abandoned when shipping moved down river to Tilbury. The government saw an opportunity for a brand-new prestige development of offices, shops and residential accommodation with wonderful views over the docks and Thames. The dock area is very close to the City and hence highly desirable to well-paid City high-flyers enjoying the 1980s



Jubilee Line train at Wembley Park Station

(EJR/CF)



Driverless train of Docklands Light Railway entering Shadwell Station

(EJR/CF)

economic boom. However, it needed a public transport link to the City. The cost of either an overground railway or an underground extension was so prohibitive that the government opted for a more cost effective solution—the Docklands Light Railway. This was much lighter and cheaper than the tubes, used shorter trains—only two carriages—with driverless computer-controlled operation and a different electric voltage. It was authorized in 1984 and opened in 1987 from Tower Gateway to Island Gardens in one direction and Stratford in the other. Initially, it was unreliable and had too little capacity, so more development work took place, including an extension to the underground system at Bank in 1991, partly paid for by Olympia & York, the Canary Wharf developers. It still has critics because it cannot be integrated into the underground and stands alone. It was a symbol of the late Thatcher government—innovative, privately built, exciting, but needing development. Subsequently, trains have increased in size, and extensions have been built, first eastwards to Beckton (1994), and second, southwards across the Thames to Lewisham (1999). However, rush-hour

capacity still leaves much to be desired. That said, traffic has risen from 18,000 passengers per day in 1988 to 55,000 in 1997.

As far as London is concerned, the postwar history of the railway system is one of lost opportunities. Some initiatives were taken, but many ideas never came to fruition. As part of British Rail's 1955 Modernisation Plans, electrification of the suburban services from Liverpool Street and King's Cross was undertaken, allowing quicker, cleaner journeys and greater capacity²². Electrification from Bedford to St. Pancras and Moorgate followed in 1982. Ambitious plans in 1981 for further electrification were abandoned following government rejection. A major project outside London was the East Coast main line from Kings Cross to Edinburgh, which was finally fully electrified in 1991 although it had been in the 1955 plan²³. One partly seized opportunity was that of cross-London traffic. GWR trains ran through to Aldgate via the Metropolitan line until 1939. The Metropolitan District Railway ran an Ealing Broadway to Southend service between 1910 and 1939, but there were no through services

from a main-line railway in the west to another in the east. This was the promise of CrossRail as described by Cecil Parkinson, Minister of Transport, at the 1989 Conservative party conference. It was to be a new tube built to main-line standards linking the Great Western line west of Paddington to the Great Eastern line east of Liverpool Street. Resistance by property owners fearing vibration and noise plus high costs have prevented it from becoming reality so far.

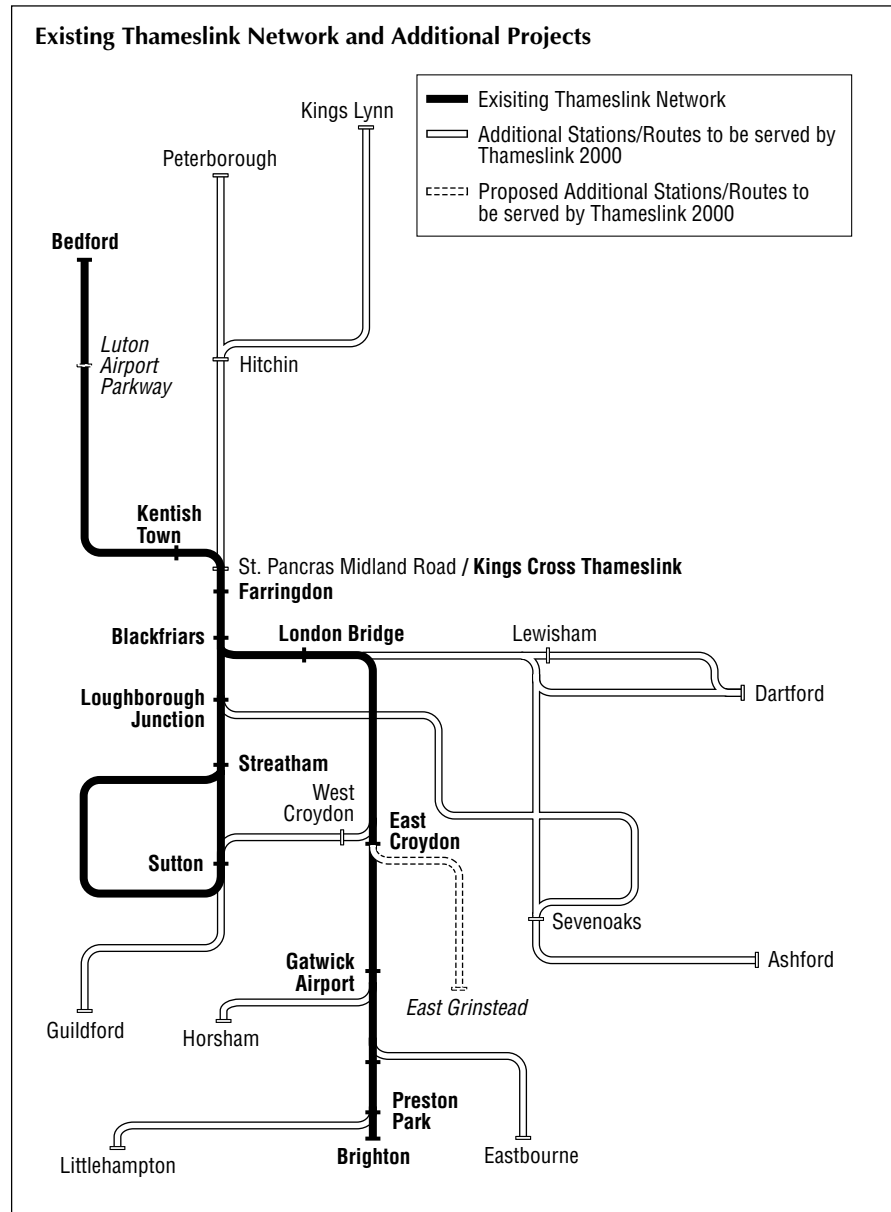
A north–south link became reality in 1988 when Thameslink trains began running from Brighton to Bedford using two electrical systems on track that had been modernized some years previously for passenger trains. This development included reopening the Snow Hill tunnel between Farringdon and Blackfriars, which enabled Network SouthEast to provide through services between Bedfordshire, Hertfordshire, Kent and Sussex. The £54-million investment (including trainsets) provided the first significant north–south services through London. It allows passengers to cross London without changing trains or stations and has proved a great success. In 1991, City Thameslink Station was opened for the convenience of commuters, but plans to upgrade a raft of services—Thameslink 2000—have yet to be implemented. They include longer trains, a new low-level station at St. Pancras and more frequent services to a wider range of destinations. The GLC financed electrification of the Dalston–North Woolwich section, allowing the North London Line service from Richmond to be diverted from Broad Street to North Woolwich in 1985. Demolition of Broad Street followed immediately to allow redevelopment of the Broadgate scheme. This was the most notable of a series of station redevelopments, especially rebuilding Liverpool Street while conserving its Victorian heritage. It was an impressive example of a private–public partnership in which property developers,

Rosehaugh Stanhope invested over £150 million; the redevelopment started in 1985 and was completed by 1991²⁴.

Airport Links

London was at the centre of the phenomenal postwar growth in air travel, so better air-rail links (see *JRTR* 19) were required. An early response was to extend the Piccadilly Line underground to Heathrow Airport. This was completed in 1977 and a 1986 extension brought the new Terminal Four into the system. This development provided cheap, frequent and relatively fast services into central London, although access was rather awkward for people with a lot of luggage. Gatwick, which became London's second airport in the late-1950s, was close to the London to Brighton main line and had its own station on that line. In 1984 dedicated Gatwick Express services were started to provide regular non-stop journeys to Victoria Station. Although the fares are relatively expensive, the trains have good luggage space and the station is directly under one of the terminals, so the services are heavily used.

It may have been the success of this service that inspired the British Airports Authority (BAA) to go into partnership with British Rail to build a dedicated service from Heathrow to Paddington Station. It was intended to be a non-stop, fast and frequent electric service. Despite a construction mishap when a tunnel collapsed causing subsequent subsidence in an office block above (which had to be demolished), it was opened in part in 1998 and fully in 1999. There has been some criticism of pricing policy, complaints that it adds to congestion on the approach to Paddington, and that Paddington was not a central location. However, its target market is business travellers for whom time is money and where the cost of the Heathrow Express



(Adapted from Railtrack materials)

plus a taxi is cheaper than a taxi all the way from Heathrow to central London. Now, both of London's premier airports are well connected to the city centre²⁵. The most important structural change to Britain's railways in the 1990s was their privatization after half a century of nationalization²⁶. The process began in the early 1980s when the Thatcher government ordered the sale of ancillary parts of British Rail that were not seen as core business, such as hotels, ferries and catering. The details behind this move

are well documented elsewhere and beyond the scope of this article. Railtrack assumed ownership of the land, track, signalling and buildings in 1994. The impact of the railway privatization on London has been limited so far, although the present Labour government plans to partially privatize the underground infrastructure. There have been no significant improvements to commuting services, although some innovative services were introduced before privatization, such as the above-mentioned Thameslink and

the Chiltern service into Marylebone. Many commuters complain that services are now worse than before, while two terrible accidents at Clapham in 1988 and Ladbroke Grove in 1999 have pointed to the need for investment in modern safety equipment and perhaps better training of personnel. However, the privatization is still too recent to be able to take a balanced perspective.

Prospects

Although London's population fell from just over 8 million in 1951 to less than 7 million by 1981²⁷, the number of people working in London has seen little change. A large number of visitors come for tourism, business, or cultural events, and the use of private transport, essentially motor cars, to commute to London declined dramatically by over 20% between 1980 and 1995²⁸. The Blair government has considerably scaled down the number of road-improvement schemes, so any increase in motor transport is likely to result in slower speeds and greater congestion. There are two ways to cope with this: buses could be given greater lane priority and tubes could carry more traffic, relieving roads of vehicles.

There are a number of exciting developments on buses that may make them more competitive. Priority bus lanes have existed for many years, but modern technology can make them much more effective. For example, microcomputers on buses nearing red traffic lights could change the lights to green in favour of the bus, so expediting the journey. Real-time display boards at bus stops could give waiting passenger details of approaching buses, encouraging passengers to wait for the bus. With deregulation, bus companies can try new routes, so offering better services to passengers. In theory, it is possible to bury cable guides in the roads to guide

buses and indicate stopping places. This may make the driverless bus a real future possibility. This technology would need to be combined with automatic barriers and ticket checkers and there may be strong passenger resistance to completely unstaffed buses.

The London underground has enormous potential, but is suffering from serious under-investment. It is intensively used, with over 860 million journeys in 1998 (a record year²⁹) covering more than 4 billion miles. During the Conservative governments from 1979 to 1997, London's public transport and railways were short of funding. As a result, much rolling stock is worn out, signalling is obsolete, breakdowns are frequent, operating headways are low and trains are overcrowded. Of course, there are large variations between different lines. The Northern Line was known as 'the misery line' because it was in such poor condition, but it has received much-needed refurbishment of carriages and trackside signalling. That said, massive investment is required to keep the system working, let alone increase its capacity and speed. Money is a problem. It may be aided marginally by the completion of installation of automatic ticket barriers, because fare revenues may rise as fare dodging becomes more difficult, but much more is needed. The Blair government, contrary to pre-election pledges, is reluctant to invest directly, and privatization looks increasingly unlikely, especially as the most favoured purchaser—Railtrack—lost much credibility following the two accidents on Paddington-bound Great Western tracks. There is also significant political and popular opposition to privatization. An alternative to outright privatization is a private-public partnership, where a private investor provides the capital for a particular improvement and then receives an annual fee from London Transport. The problem is that if it is to be attractive to the investor, the end price over several decades must

be higher than outright purchase.

The opening, at last, of the Channel Tunnel meant there was an urgent need for a suitable passenger terminal. Since much of the traffic originates from London, it followed that a London terminal was needed and, given the delays in agreeing on a high-speed link from the tunnel, Waterloo was chosen. This involved much new construction because the *Eurostar* trains have to be isolated from the rest of the station. It was completed on time in 1993 and opened in February 1994 when the *Eurostar* international services began. The route of the high-speed link from the Tunnel and the location of its London terminus were even more controversial. Much time was wasted in arguing about the route and debating the various merits of Kings Cross and St. Pancras. Both schemes required long tunnels under London, and St. Pancras eventually became the most favoured location.

The slow progress in improving London's transport may also have political causes. It may seem extraordinary to readers that London has not had an all-embracing political institution since the GLC was abolished in 1986. The Blair government is committed to appointing a mayor for London in 2000. One of the most important aspects of the mayor's brief will be London's transport system and it may well be that the central government does not wish to pre-empt any mayoral decisions or leave London's leader with unwanted commitments. Perhaps the new mayor will be prepared to try more radical solutions to improve transport, such as road pricing schemes because much of the opposition to these ideas is from people living outside London. The mayor will need to be very innovative; as London becomes a 24-hour city, the shutdown of the tubes from 0030 to 0600 seems increasingly out-of-date and hence new cleaning and maintenance practices will need to be devised. The cost of driving new lines through London is very

high, but so is the cost of upgrading the system to increase frequency and capacity.

Long-distance commuting from places like Southampton, Norwich and Doncaster is already well-established—a reflection of relative house prices. Continued movement out of London to live in dormitory towns may be possible if faster trains are introduced on some lines. One such example may be ‘the pendolino’ tilting trains promised for the Virgin west-coast main line. There is evidence that commuters are more interested in journey times rather than distance so reducing journey times by increasing speeds will open up some regions to more commuting. Rail fares are also a major factor in commuting as is spare line capacity during peak hours. The latter is a particularly hard problem to solve.

However, even if more London residents become longer-distance commuters, it does not take the pressure off intra-London services because few commuters can walk from main-line termini to work and usually have to take either the tube or bus. There are no easy answers to London’s transport problems. The appointment of a mayor may provide new leadership with dynamic ideas, but a great deal of investment will still be required. ■

Acknowledgement

We are very grateful to Grahame Boyes who read the draft and made many improvements.

Notes

- 1 B. R. Mitchell and P. Deane, *Abstract of British Historical Statistics* (Cambridge, 1962), p. 19.
- 2 W. W. Lockwood, *The Economic Development of Japan. Growth and Structural Change 1868–1938* (Princeton, 1968), pp. 482–4.
- 3 T. C. Barker and M. Robbins, *A History of London Transport. Vol. I. The Nineteenth Century* (London, 1968), pp. xxviii–xxix
- 4 Jack Simmons, *The Railway in England and Wales, 1830–1914, The System and its Working* (Leicester, 1978), p. 113.
- 5 R.H.G. Thomas, *London’s First Railway: the London & Greenwich* (London, 1972).
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