

THE STORY OF A STATION - OXFORD CIRCUS

INTRODUCTION

When the engineers rebuilding Oxford Circus station as part of the Victoria Line project unexpectedly struck tunnel iron they were rightly perplexed. Next to the Bakerloo Line platforms, it appeared to be a disused passenger subway leading sharply downwards, but where to? It was not shown on any of the engineering drawings compiled from recent surveys and a compendium of early station plans.

These engineers could not have realised that they were in many ways carrying on a tradition started by their colleagues almost exactly 60 years earlier when they, too, were rebuilding Oxford Circus station. The significance of the earlier occasion was that the station had not yet opened but the engineers were dealing as expeditiously as possible with what was the latest in a long sequence

of unfortunate delays in the opening of the Baker Street and Waterloo Railway. Reconstruction before a station even opens may not be unique, but it is certainly very unusual. In this instance the evidence remained buried for six decades.

It is too easy to take today's Oxford Circus station for granted until a minor upset causes some inconvenience. The following attempts to chart the development of the station since its earliest days, and in particular shows how a large Underground station has actually evolved piecemeal in that time, with hardly a moment when some sort of significant development is going on there. Perhaps it will bring home that stations, like people, have a life of their own.

THE VICINITY

The name Oxford Street must be known throughout much of the world as one of London's chief shopping streets, though this fame extends back little more than a century. As its title suggests, Oxford Street acquired its name through being part of the former major route between the cities of London and Oxford. However the road is of at least Roman origin, and prior to the predominance of the Oxford route formed part of the main thoroughfare to the West from London via Newgate, Tyburn, Brentford and Staines. The road was commonly known as Tyburn Lane until the eighteenth century. Authorities vary as to the exact name at about this time, the names Tyburn Lane, Oxford Road and Oxford Street being used without apparent discrimination. Miecklejohn's "London, a Short History" (1898) quotes 1729 as the first occasion of the use of the name Oxford Street.

The area to the West of the Charing Cross and Tottenham Court Roads was built up rapidly between about 1720 and 1750, largely on pasture land. The buildings erected along Oxford Street were largely residential although many of these were subsequently adapted to incorporate shops on the ground floor level.

The only noteworthy roads in the vicinity to run northwards was Tottenham Court Road and Marylebone Lane. To the south there was a fairly intense street pattern dividing the innumerable residential blocks which lie between Oxford Street and Piccadilly. One of the through routes was known as Swallow Street, this divided almost im-

mediately to the south of Oxford Street, the other road being called King (now Kingley) Street.

Argyll Street, which was the next street to the east of Swallow Street, was connected to Oxford Street via a narrow passage about 70 feet long. Argyll Street ran south for about two hundred yards before turning to the left to join Great Marlborough Street. The northern end of Swallow Street formed the boundary between the parishes of St James's (east side) and St Georges (west side). Oxford Street was the northern boundary of both these parishes, separating them from St Marylebone. Opposite Swallow Street, on the north side of Oxford Street, subsequent construction produced a block of buildings bounded by Princes Street, to the west, and Bolsover Street, to the east. The latter continued as Edward Street and disappeared into the blocks of buildings rapidly taking up all the available rind to the New Road (now Marylebone Road).

The northern side of Oxford Street in this vicinity-and indeed much of the land to the north-became part of the estate of Viscount Portland in whose possession the land remains. East of Swallow Street and to the south of Oxford Street the land formerly belonged to the Mercers Company. Disputes with the monarchy resulted in the land changing hands several times, until it was obtained by the Maddox family who in due course split it ; the portion on which the oldest part of the station was built became part of the Pollen estate. John Kemble, second Duke of Argyll, came to occupy a house just off King Street in 1706 and started to acquire many of the leases of nearby

properties up to Oxford Street, and in Argyll Street, subsequently named after him.

Little changed until under the direction of the Prince Regent (later George IV) the architect John Nash created the spacious thoroughfare from Lancaster Place to the New Road, at the same time laying out Regent's Park. The necessary Act of Parliament was obtained in 1813, however shortage of cash delayed completion in its entirety until 1840. The southern portion of the new route became known as Regent Street. North of Piccadilly it comprised a broad new road on a graceful curve. In due course it intercepted Swallow Street and absorbed the course of that road to a point just south of Oxford Street (leaving only a short stretch of Swallow Street running between Piccadilly and Regent Street). Regent Street diverted a little to the east of the former road to cross Oxford Street and then absorbed Bolsover and Edward Streets where the new route diverted to the west, to form the new Langham Place, and then to the north forming the impressive Portland Place. At the Piccadilly and Oxford Street intersections "circuses" were created as architectural niceties, both

being officially denoted as "Regent Circus". The prestigious new artery significantly increased the importance of the surrounding areas and many notable shops soon opened. The new businesses were very successful. In turn, subsequent lease renewals attracted increases in ground rents of the order of nine-fold and inevitably this became a significant factor in determining the future style of business which would be conducted in the street and its environs.

Not unsurprisingly, the existence of two locations called Regent Circus, both in the same road and only a 10-minutes walk apart, proved ultimately to be inconvenient, if not irksome. In the natural way of things, a method of distinguishing between them gradually evolved. The exact process will probably never be known, but "Wonderful London" (1930) states that, "it was the bus conductors who first used the present names," thus the northern Circus became "Oxford Circus" and the southern one "Piccadilly Circus". Official recognition duly followed, apparently between 1873 and 1889.

A STATION FOR THE CENTRAL LONDON RAILWAY

The traffic using the ancient route from the City via Newgate, Holborn, St Giles Circus, Oxford Street and Bayswater Road to Shepherd's Bush increased at a phenomenal rate as London expanded outwards. Traffic was at least to a small extent ameliorated by the construction of the Metropolitan and District railways "Inner Circle" underground railway, which ran parallel. However the apparent engineering breakthrough of deep level tube electric railways-exemplified by the City and South London Railway (CSLR)-suggested new solutions, and the Central London Railway bill of 1890 was one of numerous further such schemes. The advantage of tube lines was the reduction of inconvenience during construction as streets did not need digging up, a matter which would have made new sub-surface construction along a route like Oxford Street quite impracticable.

Nevertheless opposition to the Bill came from many quarters and it duly failed. The line was to have run from Queens Road to the City, and join up with the CSLR at King William Street. However the company persisted and after meeting many of the objections the royal assent was given on 5th August 1891, the terminals having been adjusted to Shepherd's Bush in the west and Bank in the east. Thirteen stations were to be constructed, one of which was at Oxford Circus. The Oxford Circus station site was to be situated at the northwest corner of the junction of Argyll Street

and Oxford Street, with the longer side of the rectangle running along Argyll Street.

The former restricted access to Argyll Street had been widened many years previously but the demolition required for the new station allowed for further minor improvement. Existing property on the site comprised 237 and 239 Oxford Street, which were respectively Henry White and Sons, booksellers and Willox and Co, chemists. In Argyll Street properties were numbers 15 and 16, which contained a multiplicity of minor businesses.

Sub-contractor for the Oxford Circus section of line was Walter Scott and Co, to whom work was let early in 1896. Possession of the station site had been obtained by the time of the June 1896 half yearly report and by the end of that year considerable progress had been made with shafts and some tunnelling had been started. At 80 feet, the platform tunnels were fairly deep below street level. Access was to be by four lifts (occupying two shafts) and a separate stairway shaft. An 1896 plan (illustrated) shows the proposed platform and passageway layout and the proposed one-way passenger flow. This one-way system also appears to have included the stairway shaft with separate up and down flights-intertwined in the same shaft-as indicated. However some modifications-all within the limits of deviation-were clearly made and an inspection of the now disused stairway shaft indicates that a single and not intertwined stairway

was installed-though with two access points at the lower level.

The station opened on 30th July 1900, at the same time as the rest of the line. The platforms were about 325 feet long (enough for six carriages) and were built on a "hump" above ambient tunnel level, to assist braking of approaching and acceleration of departing trains. All station finishings were in glazed white tiling and gave a bright appearance with the electric lighting installed.

The surface station (by Harry Measures) was finished in brown unglazed terracotta in a style common to the other stations on the line. Although a single storey building, provision was made for subsequent development above the structure. The entrance to the station was in Oxford Street and the exit-direct from the lifts-was to Argyll Street. The four lifts were electrically operated, with equipment of American origin supplied by Sprague and installed at the bottom of the lift shafts, in deep lift pits; the lift travel was quoted as 75 feet. A basement area directly beneath the ticket hall provided gents lavatory accommodation and a mess room for the porters ; the ladies lavatory was at ticket hall level. Three ticket windows were provided in the ticket office and service must have been brisk with the twopenny flat fare origi-

nally charged-the tickets were collected and cancelled en route to the lifts. The first year's traffic amounted to one million passengers.

Not long after the station opened an elaborate four-storey red-brick building by Delissa Joseph was erected above the station which came to accommodate the head offices of the Central London Railway, provision for access to the superstructure having been incorporated in the design of the station when built. Although much of the accommodation in this building was subsequently commercially let, the head offices of the Central Line retained their presence in this building until 1979 when it removed to Baker Street (though London Underground retained some occupation subsequently). Various excrescences soon appeared on the exterior of the building in the interests of traffic promotion. In particular a glazed canopy was erected over the entrance and a huge "TUBE" sign attached to the side of the superstructure above the canopy. Neither feature contributed much to the overall architectural merit of the building, which included a stone cherub surmounting a pinnacle above the entrance-until, this too, got in the way of a London Transport "bullseye" sign in 1952 and had to be removed.

A STATION FOR THE BAKERLOO RAILWAY

The Baker Street and Waterloo Railway (Bakerloo) the was the next arrival at Oxford Circus, though setbacks had caused a thirteen year gestation period following the passing of its enabling. The Bakerloo followed a very much more recent traffic artery than the Central London. Initially it ran from Baker Street (Metropolitan Railway) station via Park Crescent, Portland Place, Regent Street, Haymarket and Northumberland Avenue before crossing the river to terminate at Waterloo (later extended to Elephant and Castle). The Bakerloo scheme was first promoted in 1891 but the enabling Act was not secured until 1893, receiving the Royal assent on 28 March. The Oxford Circus station authorisation was unusual in that the limits of deviation allowed for two possible station sites, one situated in Great Castle Street, to the north-west of Oxford Circus, and the other in the vicinity of Argyll Street, just to the south-east of the Oxford Circus quadrant. Section 46 of the Act required that in the event of the Argyll Street location being selected the station would require to be set back to a new building line to allow the width of the street to be made uniform, and improving the access to Oxford Street (removing an anomaly dating back some hundred and fifty years ; one must bear in mind the CLR had also to im-

prove the building line on the other side of Argyll Street, but construction was not yet in sight).

Five years elapsed before finances allowed a start of work on the Bakerloo in August 1898. However work commenced in a northwards direction from a shaft in the Thames and, later, from Baker Street southwards, so little happened at Oxford Circus for a while longer.

It is clear that at the latest by the end of 1899 the Bakerloo had opted in favour of the Argyll Street site-a very small square plot on the western corner of that street and Oxford Street, and right opposite the Central London Railway station by now under construction. The tiny site permitted the sinking of only two shafts, a single 34 ft shaft for the lifts and an 18 ft shaft for stairs. It was, frankly, not a very convenient site either in size or in relation to the proposed location of the platforms (which were to be north of the Circus, under Regent Street). However the protective clauses inserted into the Act to satisfy the vested interests of the Portland Estate made a station building on the north side of Oxford Street an even more unattractive venture.

The existing occupiers of the station site comprised the premises in Oxford Street then numbered 241, 243, 245 and 247 which were, respectively: a London & North Western Railway

booking and inquiry office; Everard and Co, tobacconist; Thomas Millard and Sons, opticians, and Cooper, Cooper and Co Ltd, tea merchants. Number 17 Argyll Street, referred to as the 'Pamphilion' (which appears to have been some sort of ale house) was also included.

It was a requirement of the 1893 Act that plans of the station be submitted for approval to the London County Council, and approval was duly sought in a letter of 2nd February 1900. The LCC's Building Act Committee noted with satisfaction that the station was set back at an angle to permit the widening of Argyll Street. Nevertheless the plan was thrown out on the grounds that the space in the booking hall would be insufficient. The LCC and the company were unable to reach agreement on the matter, which was then referred to arbitration (the LCC were frequently at loggerheads with the tube railways about their stations, the LCC's legal position in such matters being open to debate, and the railways being disinclined to be over-cooperative).

Under these particular circumstances the Act required the President of the Institution of Civil Engineers, then Douglas Fox, to appoint an arbitrator, and William Shelford M.I.C.E. was duly appointed. His award was made on 13th June 1900 with suitable alterations to internal detail having been made (this was mainly confined to moving the ticket office-the exterior walls of the station and the position of the shafts of being unmoveable).

In March 1901 the directors of the Bakerloo stated that they had obtained possession of all the property for the station and that the site was being cleared with preparations being made for sinking one of shafts. No running tunnels had been built in the area but good progress towards Oxford Circus was being made from both the north and the south. However at the end of 1900 the London and Globe Finance Company which was financing the Bakerloo, and with which it shared directors, failed as a result of a scandal. Work was immediately stopped on the northern portion of the line to save money but work was pursued as a more relaxed pace on the southern portion until May 1901 when activities were reduced to little more than a token gesture. In consequence, the Directors reported in August 1901 that progress at Oxford Circus have been confined to underpinning property adjacent to the station, and pulling down the last house on the site in preparation for sinking the 18 ft shaft which, as yet, had not been started. Neither had the running tunnels yet reached the station site.

The Bakerloo was saved by the intervention of an American syndicate, which had already purchased a controlling interest in several tube

schemes (these eventually opened as the Charing Cross Euston and Hampstead Railway and the Great Northern, Piccadilly and Brompton Railway). The necessary negotiations took several months to complete but the London and Globe's interests in the Bakerloo became vested in the syndicate's Metropolitan District Electric Traction Company in March 1902, following which progress on the construction of the Bakerloo was again vigorously pursued. A little later the traction company was renamed the Underground Electric Railways Company of London Ltd (the UERL), which survived until 1933.

In April 1902 the directors were able to report that the 18 foot shaft had been fully sunk and the passage connecting it with the up (southbound) tunnel had been built. At this time the southbound station tunnels had not actually been started, although by August 1902 it had been completed. By March 1903 the 30 foot lift shaft and remaining lower passages were well advanced and work was in progress on the northbound platforms, all of which work was largely complete by August 1903.

Various further problems now came to light. The Board of Trade was required to approve many aspects of new railway schemes included amongst which was the design of underground railway stations. This was a comparatively new requirement that had not been in force when the Bakerloo was originally authorised, nevertheless the view was now taken that any new plans had to be submitted. In the case of Oxford Circus there was intense dislike of the low-level layout, which was felt to be restrictive to passenger traffic and failed to meet the Board of Trade's latest minimum criteria, then under consideration. Restraint on their part had been exercised on the basis that the design had originally been authorised by parliament; nevertheless the company was left in no doubt that the layout (then under construction) was considered objectionable.

To the Bakerloo's credit the arrangements were reviewed; as a result the Company decided to build a new passage (P8) to minimise the conflicting flows. Apart from the construction of the new passage there was the filling in and making good of the connections with the original passage (P6), leaving, as the only evidence of the previous scheme, a short level portion in an otherwise sloping subway.

Meanwhile, a difficulty had arisen at Street level. In the light of experience on the other tube lines it was now desired to improve the level of the ventilation on the Bakerloo by the use of fans. This required a fan motor room at street level, which could not be accommodated within the layout dictated by the Shelford award. Leslie W

Green had been appointed as company architect and arranged to meet the LCC's superintending architect on 15th December 1903 as a result of which the street level layout was completely revised, the opportunity being taken to remove some of Shelford's impractical proposals as well as improving further the area for passengers, within the constraints of the site. By March 1904 the company was therefore able to report that the surface site was available for reception of the station building but that a short lower level passage required by the Board of Trade still required to be constructed.

Whether or not any of the additional low-level passage was actually constructed is now not easy to establish, for even while preliminary work must have been in progress a revised plan (dated December 1903) was forwarded to the Board of Trade at the end of January 1904. The object of the revision was to replace what was now becoming a highly inconvenient passageway to the northbound platform while taking into account the Board of Trade's objection to the previous arrangement. The replacement passageway would bridge the running tunnels, rising and falling in a 1 in 12 slope whereas the earlier passageway dived underneath the tunnels, presumably to avoid interfering with the Regent Street sewer, which ran just above the southbound running tunnel. The new passage had therefore to squeeze between the sewer and the running tunnels, a delicate matter. One result of substituting slopes for stairways was that the passage could not be brought to platform level at the south headwall but had to run parallel with the platform for about 80 feet until the connection could be made where the two were at the same level. The earlier passage (largely constructed) was completely abandoned and at least partly filled in. It was the entrance to this long-forgotten tunnel which the Victoria Line Engineers encountered sixty years later.

The resulting station layout while perhaps better than that proposed was unusual and unlikely to prove at all satisfactory for very long, nor did it comply with the Board of Trade general requirements for a separate access to and exit from each platform. The board's Railway Inspectorate remarked:

"We admit there is room for criticism of Oxford Street station, but the site here was one of exceptional difficulty, as the company had to encounter not only the Central London Railway, which had to be crossed at right angles, but also large and important sewers of the LCC which affected the arrangements of the passages between the platforms and the lifts, and further, the company were hampered by restrictive clauses in the Act of Parliament preventing them acquiring

lands which might have permitted of a more convenient arrangement".

The work of erecting the station buildings was started at the end of 1904 or early 1905 and was completed largely in accordance with the plans agreed with the LCC in 1903. In common with the other tube stations belonging to the UERL syndicate the station building was steel framed, two storeys high, and designed around a series of large arches the curved tops of which incorporated the first floor windows. The building was clad in ruby-red glazed terracotta blocks supplied by Leeds Fireclay. Three lifts would be installed in the single 30 feet shaft, each with a travel of 73 feet, but unlike the CLR lifts over the road the machine room was to be installed above the lifts, on the first floor level. The equipment was to be supplied by the Otis Elevator Company. Again the lift operator worked from within the lift, but unlike the CLR lifts he was to be assisted by having the exit gates operated by compressed air from a lever near his controls at the entrance. Like the CLR station the main entrance was in Oxford Street with the lifts disgorging their load into Argyll Street. The only passenger facility provided at ticket hall level was the ticket office itself. Two stairways led to basement level, one to the ladies lavatory the other to the stair shaft, gents lavatory and staff accommodation. Little use was made of the basement area actually under the station building itself, the lavatory and staff rooms being installed in the vaulting beneath the pavements bequeathed by the earlier buildings on the site (those beneath Argyll Street-still there today-reflecting the former building line).

The station opened on 10th March 1906, at the same time as the remainder of the Bakerloo Railway. Traffic was slow to grow at first although it rose steadily after the twopenny flat fare system initially adopted was replaced with graduated fares. The low-level finishings of the station was similar in general layout to most other stations on the UERL, with a system of white and coloured tiles forming a repeating pattern along the platform walls and with coloured tiled bands extending upwards over the ceiling vault, which (unlike the CLR) was otherwise of a plaster finish. The station name was repeated in large lettering fired into the tilework at three places on each platform. A low level connection was formed with the Central London Railway that required the provision of a small interchange ticket office for people changing lines, through fares were not initially available. An early plan indicates that one of the interchange passages was for traffic to the Central London and one from that line. Whether or not the CLR had there own interchange ticket office is not known.

THE ADDITION OF ESCALATORS

There is no evidence to suggest that the Central London Railway station, with its four lifts and relatively short passageways to the platforms, was not the early years able to cope quite well with the prevailing traffic. This cannot be said of the Bakerloo station, where events developed rapidly.

Instructions dated 1907, transcribed to the following table, shows something of the way the Bakerloo station was then operating.

Time	No of Ticket Office Windows in Service	No of Lifts in Service
Start until 7.30am	1	2
7.30am-10am	1	3
10am-12noon	1	2
12noon-4pm	1	3
4pm-5.30pm	2	2 (from 3.30pm)
5.30pm-8pm	3	3 (from 5pm)
8pm-9pm	2	2
9pm-10pm	1	2
10pm-11.30	2	3
11.30pm-Close	1	2

The existence of the busy late night theatre peak is pronounced. It was noted that with three lifts a 50-second lift service should have been possible. The two outer lifts were a little larger than the centre lift but the average capacity could have been only about 66, which would give a total hourly flow of less than 5,000 passengers in the peak period-by modern day standards about six well filled train loads. When traffic levels picked up congestion must have been serious, and substantial use must also have been made of the emergency stairs.

Traffic must have been encouraged by the introduction of through bookings between the Bakerloo and Central London Railways from Wednesday 18th December 1907. By agreement with the Underground Group and the independent lines it was decided to adopt the word "Underground" as a common marketing term from March 1908, including some joint publicity. Soon afterwards canopies appeared over the station entrances bearing the name "Underground" prominently.

In March 1909 a system of bells operated by approaching trains was introduced, the object being to try and connect the inwards lift service at quiet times with the train service both north and south, the system was also used at some other stations. By this time cloakroom accommodation had also been made available to passengers presumably

at basement level. Towards the end of 1909 it was clear that in terms of traffic levels the Bakerloo station was in real trouble ; bookings had exceeded 3 million (with another 21/2 million people exchanged with the Central London Railway). During the year the company attempted to obtain parliamentary powers to enlarge the station premises but the Bill was withdrawn.

However a salvation offered itself in the form of escalators. At this time none had been tried on a railway system in Britain although those installed elsewhere showed some promise, and a pair of escalators were in process of installation at Earls Court station. In consequence, the Bakerloo sought powers (granted on 26th July 1910) to install a pair of escalators linking the existing station site to new low level subways which would provide a shorter, though not necessarily quicker, route to the platforms compared with that from the lower lift landings.

It would be helpful at this point to add that another Bill enacted on 26th July 1910 had the effect of amalgamating the Bakerloo Railway with the other two tube railways owned by the Underground Group to form a new company called the London Electric Railway Company (LER), which name will be used hereafter. The Memorandum distributed to shareholders at the time specifically states:

"In connection with the consolidation of the three Railways it is proposed to carry out much-needed improvements by additional works at Oxford Circus, where the present accommodation is inadequate for the large amount of local and through traffic dealt with"

The work required was extensive and required careful planning, particularly in view of a number of highly restrictive clauses in the Act making it impossible to break up the surface of Oxford Street (beneath which the escalator shaft started) and confining the working site to the area of No. 18 Argyll Street-the "Argyll Hotel". In fact visual evidence suggests that the hotel site might not have been used and that all construction was achieved through the railway's commercial unit on the corner site and through hoardings erected in Argyll Street next to the lift exits.

Work started in November 1912 with the construction of a 110 ft long, 16 ft 4 in diameter shaft from the basement of the station sloping down to a point 9 feet above platform level and 30 feet short of the platform headwall. The escalator shaft pierced the existing northbound subway

requiring an alternative route to be provided in advance for interchange traffic (P 13). To allow connection to the lower escalator chamber subway P 11 required reconstructing towards the southern end to form, in effect, P 14. Three further passages were added to introduce an element of one-way working. All this work must have been immensely difficult under the prevailing traffic conditions, and have required careful planning.

Part of the new low-level subway system appears to have been in use by June 1913 when the advantages of the multi-opening passages in distributing their load along the platforms was explained. Whilst this work was in progress the Central London Railway became a part the Underground Group on 1st January 1913 although it was not for another year that the interchange ticket offices were closed "as serving no useful purpose" and until April 1914 when both railways' ticket offices at Oxford Circus sold tickets for both railways. This latter move must have partially eased the difficulties of the LER (Bakerloo) station during rebuilding.

The new escalators came into use on 9th May 1914, at which date they were the longest in the world. Two machines were provided, one for ascending traffic and one for descending, although the latter could be operated in the 'up' direction if the 'up' escalator failed. The machines were installed by the Otis Elevator Company and later became known as the 'A' type, operating at 90 ft per minute. Unlike subsequent escalator types, the driving mechanism was not at the top extremity of the machine but at a point near where the vertical rise flattened out; the comparatively high rise at Oxford Circus required the drive shaft and drive wheels to be duplicated some way down the machine, the two being connected together by shafting. Since "comb" type escalator landings had not yet been introduced the passengers were required to step off the machines sideways, a manoeuvre encouraged by the opposite balustrade being angled to pass over the treads and sweep (or shunt) people off if they hadn't quite got the message. Since the nominal 'down' escalator was reversible both machines required shunt type ends at the top landing whereas only the 'down' machine had a shunt end at the lower landing, the 'up' machine being end loading. The escalators sloped at the curious and as yet unsatisfactorily explained angle of $26^{\circ} 23' 16\frac{1}{2}"$, as with other A type machines; the balustrading was all of a heavy wooden paneling.

Since, of necessity, the escalators terminated at station basement level it followed that proper passenger access was required between street and basement, the older narrow stairs were quite unsuitable. However it was not possible to close

down the lift installation until the escalators were in operation, hence for a while it would be necessary to operate the station in the basement with a quarter of the area obstructed by the lift shaft passing through, even more inconveniently this was only a few feet from the ends of the escalators. The Board of Trade noted that for a while the only way out would be via a temporary passage emerging in Argyll Street, and that some congestion was likely at the top the escalators during the busy hours; the contingency plan required both escalators to be used for 'down' traffic and the CLR lifts for the 'up'-of course the 'up' escalator was not reversible and would have had to be used as a rather long fixed stairway.

Soon after the escalators opened the railway asked for Board of Trade approval to make this temporary exit permanent, however Westminster City Council were understandably unhappy about a permanent exit partly in the existing carriage-way and the LER made other plans.

The Bakerloo appears to have taken the former access to the basement and the emergency stairs out of use shortly before the escalators were introduced, at the same time diverting inwards traffic from the main station entrance to a temporary one on the site of a shop entrance, this allowed the main entrance to receive a wide staircase down to the basement to form a new way in, direct from Oxford Street. In the meantime the CLR station provided alternative lavatory accommodation and emergency stair access. Once the lifts were dismantled and the top portions of the shafts demolished, and both old and new ticket hall areas had been properly floored over, the permanent stairway exit to Argyll Street and the ticket offices were installed and, apparently, completed in July 1914.

The former Argyll Street cellar vaulting was reinstated as staff accommodation while part of the former shaft area became a ticket office, this time with five windows. Two new staircases led from the ticket hall to an intermediate landing from which a third stairway led up to the new exit in Argyll Street. Beneath the intermediate landing a cloakroom was provided. Of course, all this freed up valuable space at ground floor level, and the entire area not used for the entrance and exit stairs was then commercially let. The former emergency stairs were re-instated but were terminated at sub basement level; new stairs and passages connected them with the new ticket hall near the top of the escalators. The temporary exit in Argyll Street was removed and the roadway made good.

Admirable as the works may have been the ire of the LCC was raised when the Underground company sent them details of a fire escape from the new office block over the LER station. The

plans showed part of the Underground station and some eagle eye noticed that it now bore no relation to the plans authorised in 1903 and that they had not been consulted about any change. Strong protest was made but after some sabre rattling it

was conceded that the new arrangements were in fact, better, and the LCC contented themselves with telling Underground not to overlook them in future.

MODERNISING THE CENTRAL LONDON STATION

When the Central London Railway was acquired by the Underground Group in 1913 its operating practices were soon made to converge with LER practice. While this new approach did not specifically affect Oxford Circus, the heavily loaded station did benefit from a few of the new ideas. A feature which had particular impact was the equipping of the Central London Railway lift 'exit' doors with air engines. By implication, this indicates that lifts now became 'cross-flow, with passengers leaving from the opposite side to that which they entered (instead of entering and leaving at the same end at each landing). In turn this would mean the passenger flows to and from the lower landing would have been reversed at the same time (P1 and P3).

Although the CLR station had more or less coped with increasing traffic for 14 years the Underground Group clearly felt that it had now reached its capacity and would benefit considerably from the now proven benefits of escalators; traffic at both stations in 1914 amounted to some 14 million passengers, and was continuing to grow rapidly. The site was nearly as difficult as that at the LER station, but a scheme was soon established in principle and authorised by the Central London Railway Act 1914, receiving the Royal assent on 8th July. Britain entered World War One on 4th August. Clearly resources were now required for war work as the trains were running luxuries such as escalators had to wait. Nevertheless traffic growth continued relentlessly and 1919, the last year of the war, the annual passenger usage increased to a phenomenal 36,614,000 (it was the Combine's third busiest station). Whilst this quite exceptional traffic level could not last when peacetime conditions settled down, the trend was nevertheless an upward one and the escalator project was revived as soon as possible. During the 1920s a considerable amount of nearby redevelopment was threatened, with modern high capacity offices and shops replacing most of the 18th and 19th century property; this would significantly increase peak hour traffic.

Work on the redeveloped station actually started in October 1923. The scheme involved the construction of a broad subway the width of Argyll Street and extending out beneath Oxford Street for about half its width. The subway would in effect be a huge enlargement of the LER ticket

hall, but would encroach into the basement of the CLR station, receiving new entrances from that building. From the area beneath Oxford Street a 100 ft long, 17 ft diameter, escalator shaft would be driven down to point immediately above the westbound platform tunnel, where the lower escalator chamber would be formed. From here the passage would pass to a point above and between the two platforms, from where stairs would lead down to cross passages to provide an entrance and exit. A feature of the lower escalator landing was that the circular tunnel intersected the platform tunnel on which it sat. This required the progressive removal of a length of the upper tunnel segments and their replacement by cross girdering upon which the equipment of the lower machine chamber rested; the ceiling-now flat-being subsequently made good.

The driving of the escalator shaft was conducted from a hoarding in Oxford Street and required the extensive diversion of gas, water, electric and hydraulic mains. Another hoarding in Argyll Street enabled the construction of the ticket hall extension. The work was very delicate and required introduction of a considerable quantity of supporting girder-work which would support the streets above and carry the loads of the station frontages in Argyll Street and allow the demolition of the supporting walls in the basement.

The new CLR escalators and part of the extended ticket hall came into use to serve the Central London Railway on 5th July 1925 using a temporary arrangement of entrances and exits in the old LER station building. However, the Bakerloo Line escalators were taken out of use from the same date to allow extensive engineering work to take place. Bakerloo traffic was therefore directed temporarily to the CLR station building and used the lifts and interchange subways to get to the Bakerloo platforms. The Bakerloo Line escalators are believed to have been reinstated on Sunday 16th August 1925 from which date the CLR (temporarily Bakerloo Line) lifts were withdrawn from service and all traffic used the new ticket hall. Work then proceeded on dismantling the lift equipment and part of the top of the northern shaft to allow the ticket hall expand into CLR station basement area, from which a new staircase to

Oxford Street and two staircases to Argyll Street were built.

The two escalators were supplied by Waygood-Otis and were of the "L-HD" type, which rose at 30 degrees to the horizontal. The early "L-HD" types had shunt type landings but in 1924 a new installation at Clapham Common had been equipped with comb-type landings (end loading and unloading at top and bottom), following which all subsequent installations (including Ox-

ford Circus) had had comb landings. One advantage of this system was that whatever the nominal direction of operation all machines were reversible. One of the disused lift shafts was adapted as part of the ventilation scheme for the Central London platforms and a fan was installed. This followed a similar use of the former Bakerloo shaft into which a ventilation and "ozone air" plant had been installed, which linked via the new ventilation passage to both Bakerloo running tunnels.

EASING THE FLOWS

Apart from the major engineering works described so far, numerous minor steps were taken to try and improve the flow of passengers and prevent congestion. Following the introduction of Bakerloo escalators in 1914 the main point of congestion transferred itself to the Bakerloo Line platform level; here conflict arose between those leaving and entering the platforms when trains arrived, a particularly bad problem on the northbound side. With this problem in mind a system used on New York's Interborough Transit System was examined with some interest. It consisted of an elaborately organised arrangement of barriers along the length of the platforms, each one set parallel to, but several feet from, the platform edge. Incoming passengers were directed to wait behind the barriers while those disembarking from the trains had cleared out of the way of the train's gates (passing through a number of gaps in the barrier opened up for the purpose). When the way was clear the platform attendants slid numerous different set of bars out the way to allow waiting passengers to stream through the gaps and on to the waiting trains.

Board of Trade authority was sought in May 1917 for a very much less complicated arrangement, though based on a similar principle, to be erected on the northbound Bakerloo platform, as shown on plan?. Passengers were evidently kept behind the barrier until disembarking passengers were clear whereupon, presumably, there was a mad dash for the train. The system must have had some merit since it was extended to the Central Line platforms in the following year. The method was apparently superseded by a more overt system of queuing, also in 1918, but even this seems to have been short lived.

Another ploy to speed up traffic was tried successfully in February 1924 by the simple expedient of doubling the intensity of the lighting, it having been discovered the passengers' rate of progress appeared to be proportional to the amount of light. This followed a recorded message played at passengers using the escalators requiring them to "please keep moving. If you must stand,

stand on the right. Some are in a hurry, don't impede them". The announcements were introduced in 1921; like most innovations of this sort little publicity attended its demise, so it is not known how long the announcements lasted-they probably didn't survive the completion of the third escalator in 1928.

Further strain was put on the station by the gradual lengthening of trains to six cars, the improvements in the level of train service and the introduction of more modern air-doored stock by 1930 (replacing the last of the "gate stock" trains with their restricted, manually control gates situated only at the car ends). Great attention was then given to reducing the station stop times to an absolute minimum to keep the service on the move. Although the station coped, towards the end of the 1930s ever-increasing traffic levels were again causing difficulties, mainly because of congestion caused by opposing flows. Trouble was foreseen. A forthcoming programme of railway extensions was in the offing that affected both the Central London and the Bakerloo Lines. Trains on the latter were to be extended to 7-cars and on the former to 8-cars, and this would require all four platforms to be extended. Traffic was likely to increase appreciably as result. As part of the same improvement scheme it was therefore decided to offer partial relief to Oxford Circus by installing a pair of high-speed lifts in one of the disused Central London Line shafts in an attempt to clear passengers from the lower station more quickly.

The advent of War delayed inauguration of the new lift service until October 1942. The two lifts were of the Wadsworth high-speed type with a maximum speed of five hundred feet per minute (Queensway was the only other station to received lifts of this type). Installation was unusual. For a start it comprised three landing levels, and at each one only a single end of the lift was available for ingress and egress. Furthermore the installation was primarily intended for traffic leaving the station, though it could help 'way in' flows at certain times. Only one of the original CLR lower landing levels could be used as the other had been appro-

riated for ventilation purposes. Another novel feature was the provision of a motor generator set for each lift's power supply; this was placed at lower landing level although the winding gear was located above the lifts in the building over the station, now known as Western House (the original lift motors were below the lifts). A second landing was made at ticket hall level (65 ft above the bottom landing) by making a single entrance in the lift shaft, which emerged just off the ticket hall in the passage leading to the most southerly of the exits to Argyll Street. The top landing was 10 feet higher up, discharging passengers directly into Argyll Street.

Several combinations of lift operation were available. The lifts could be operated manually from within the cars to and from any level. An alternative form of manual control was available from the bottom landing (to send a lift to ticket hall level) and from the ticket hall (to send a lift to the lower level). A system of automatic operation was also available, and this allowed for three different modes of operation:

* Mode X - lift operates automatically between lower and street levels. [Useful for clearing lower station quickly]

* Mode Y - lift operates automatically between lower and ticket hall levels. [Useful auxiliary way in when exiting traffic light]

* Mode Z - lift operates automatically between lower and street level, thence to ticket hall level and returns to low-level. [Useful in evening peak when both-way flows heavy].

In automatic working landing stops were timed and visual and audible warnings were given before the doors closed. Whenever the lift operated to street level in automatic operation a member of staff was required at street level to discourage anyone from getting in; where the lift was used for passengers entering the station they were picked up at ticket hall level. Normally, however, the lifts were used only for outgoing passengers, the intention being to make it easier to clear the Central London platforms in the increasingly congested traffic peaks.

THE QUESTION OF MAJOR RECONSTRUCTION

A report by the operating manager into future traffic development and requirements of the Underground, dated August 1939, states that the reconstruction of Oxford Circus station 'is becoming a matter of some urgency'. It noted that it was the physical features of the alignment of the present station, and the foundations of buildings such as Peter Robinson and Liberty's, and the necessity to keep traffic moving during alterations, which was putting great difficulties in the way of planning alterations. Several schemes had been contemplated but none of them was very satisfactory.

Traffic at the station was near overwhelming already and was likely to increase very much more when the extensions of the Bakerloo Line (to Stanmore) and Central Line (to Epping, Hainault and Ruislip) had been completed. At this time traffic just entering the station annually was 13,550,000, about one million more than that of Piccadilly Circus, which had been comprehensively rebuilt in 1928. It was noted with little comfort that Oxford Circus ranked as the eleventh busiest station in the world (total traffic including interchange was 35,300,000). The report baldly stated: 'Oxford Circus is a medley of tortuous subways and inadequate ticket concourses founded by competitive companies 30 years ago at a time when no one was able to visualise the present growth of London or the part which the Underground would have to play in its movement'. So there we have it.

It may be asked why the problem was as bad as it was. Regent Street and much of Oxford Street had been largely rebuilt in the 1920s with grander buildings of more storeys, so not only was the general traffic growth caused by the expansion of London a major factor but the expansion of shopping and other office facilities locally caused the Oxford Circus area to be much more of a focal point. The reduction of inner London housing accentuated the one-way commuter flows, but Oxford Circus station suffered from heavy evening traffic leaving the station for shows, shopping and eating out, and this conflicted with the commuters trying to get home—a problem magnified on late night shopping nights. The problem seemed so intractable that the new Underground lines being planned in the 1930s were forced to avoid Oxford Circus to prevent matters being made even worse. In fact by planning routes close to adjacent stations such as Tottenham Court Road and Bond Street some peripheral relief might have resulted at Oxford Circus itself, but it was perverse that the complexity of providing relief at the station itself seemed to defy any rational. One might have thought that new tube routes through Oxford Circus would have helped matters, but at that time the main constraint was the awkward station site itself.

The Second World War resulted in some temporary stagnation, but afterwards passenger traffic shot up to peak in about 1950. Some facts

and figures are available from 1951-52 and give some idea of the traffic being dealt with.

ANNUAL STATION USAGE 1951

Journeys originating and ending	
28,000,000	
Interchanging	12,000,000
TOTAL	40,000,000

TRAFFIC MOVEMENT EVENING AVERAGE

(Originating) November 1952

5.0-5.15	3696
5.15-5.30	3591
5.30-5.45	5157
5.45-6.00	3401
6.0-6.15	3077
TOTAL	18,922

NUMBER OF TRAINS HANDLED 5.30-6.0pm MONDAY-FRIDAYS

Bakerloo NB	17 trains 139 cars
Bakerloo SB	15 trains 105 cars
Central EB	16 trains 125 cars
Central WB	16 trains 120 cars
TOTAL	64 trains 489 cars

FACILITIES AVAILABLE

Escalators	3 to/from Bakerloo 2 to/from Central
Lifts	2 operating 8.0 am until 4.0 pm for way out only

STATION CONTROL (Restriction on inwards traffic exercised by LT Police 5.0pm to 6.0pm)

Bakerloo entrance	1 constable
Central entrance	1 constable
Argyll Street entrance	1 constable
Ticket Hall	1 Sergeant and 1 constable patrolling

STAFF ESTABLISHMENT (not including police)

Senior Station Master	1
Station Master	2
Chief Booking Clerks	1
Senior Booking Clerks	2
Booking Clerks	5
Station Foremen	2
Cloakroom Attendants	2
Portable Ticket Machine Operator	1
Ticket Collectors	15

Stationmen/women	14
TOTAL	45

TICKET MACHINES

Fare denomination		Number
Daily Usage		
2d	5	3352
31/2d	5	3008
5d	5	4525
7d	4	2061
81/2d	2	317
10d	1	141
TOTAL	22	13,404

BREAKDOWN OF BOOKINGS

Ticket Office	53 per cent
Automatic Machines	40 per cent
Portable Ticket Machine	7 per cent

CLOAKROOM

Daily Deposits	300 items (av)
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Two matters perhaps require some explanation. The term 'station control' is used to describe the deliberate restriction of incoming passengers to prevent dangerous congestion within the station. At Oxford Circus the idea would have been to balance those coming in with those being taken away by the trains. Any delay to the train service (however minor) could result in the station, in effect, being closed until it was safe to admit more passengers. The second point to note concerns ticket issuing. Great weight was placed upon the use of the automatic ticket machines and by the early 'fifties the number of passimeters (booth ticket offices) had dwindled from the bank shown in photo X to just a single office with two windows. This rearrangement is understood to have taken place around the period 1939 to 1942. However, a man was employed with a 'TIM' type portable machine to sell the more straightforward tickets to those in the queues-the tickets were similar to those issued from blank rolls on certain buses; amazingly this method (involving just one man) managed to dispense 7 per cent of all tickets sold. And it was in this fashion that this very important central London station, whose need for reconstruction was urgent at the dawn of the Second World War, struggled on for nearly a quarter of a century longer.

THE VICTORIA LINE

Pre-war plans for the proposed south to north-east tube route studiously avoided Oxford Circus, the route initially passing north through

Tottenham Court Road though modified later to pass north through Bond Street. The scheme subsequently became the proposed "Route 8" of the

Railway (London Plan) Committee's report of 1946 (which still wanted Bond Street in spite of many other alignment modifications). The first proposal for utilising Oxford Circus was announced in the report of the London Plan Working Party of 1949, in which the modified route 8 became the new Route C.

The Committee observed that with the revised routeing through Oxford Circus a heavier traffic on Route C could be expected (especially outside the peaks). It was noted that 'satisfactory cross-platform interchange at Oxford Circus with the Bakerloo Line can be provided, but only if the new route is worked with a standard size tube stock, since available space at Oxford Circus is restricted' (this follows an earlier proposal to use main line size tube trains in larger tunnels). It appears that by 1949 the engineers felt they could now cope with the Underground obstacle course at Oxford Circus.

A paper written about Route C in 1951 refers to Oxford Circus as 'probably one of the most important stations on the new Line'. After referring to the 'difficulties' in being able to handle the existing traffic it is observed that it was obvious that the existing surface level entrances and basement level booking hall would be completely unable to cope, with the result that much more extensive rebuilding would be required here than at other stations on the new line. A tentative plan of the rebuilding proposals is shown as figure X, but beware of the heavy stylisation.

The fundamental principle adopted was the provision of a complete new ticket hall beneath the Circus to be used entirely for way in traffic, with separate new banks of escalators to all lines. The existing escalators and station premises would then be used entirely for way out traffic. On this basis parliamentary powers were obtained in 1955 and in due course the route became known as the Victoria Line. But nothing happened at Oxford Circus for several more years because finance for the new line was not forthcoming.

The line was at last authorised by government on 20th August 1962, and since it was envisaged the Oxford Circus station reconstruction was likely to be the single most time-consuming task within the whole Victoria Line project preliminary works started almost immediately. The first task was to undertake a huge exploratory survey of the new station site to determine the location of all the mains and services of the statutory undertakings, this could only be done by physically digging for them which meant that work had largely to be done at night-it took six months.

The fundamental principle of reconstruction was the same as that conceived in 1951 although much detail differed. In essence this was a new

ticket hall beneath the Circus, new accesses to the platforms and complete segregation of 'way in' and 'way out' traffic. Nine new escalators were to be provided, with retention of the existing five, which would be updated. A completely new system of one-way interchange subways between the Bakerloo/Victoria Lines and the Central Line were also to be built. The lifts would be withdrawn. The problem was to knit all this into the existing subterranean network whilst keeping the over-worked station in complete operation throughout; added complications were the requirements to avoid upsetting traffic in Oxford Street and Regent Street or of causing too many problems to the local traders and property owners.

The low-level works had to be phased with great care with construction being executed from a worksite in Cavendish Square, from which lengthy access tunnels had to be built. Two 15 ft diameter shafts were sunk from the south side of the square. One of these was 80 ft deep from which a 380 feet long 12 ft diameter heading was driven to the site of the northbound Victoria Line station tunnel, from which point the station tunnel drive commenced. The other shaft was a hundred feet deep from which a much longer heading was constructed which led to the site of the Victoria Line southbound tunnel. From this heading led a branch turning south to enable the construction of the new Central Line interchange passageways.

In the main new passageways were built and opened in a way which allowed those they replaced to be closed the next day. For the convenience of readers these changes have been grouped arbitrarily into 10 phases (A to J) for the purposes of illustration in the accompanying diagrams, which are largely self-explanatory. As each phase of the reconstruction proceeded, the new passageways gradually eased the cramped and conflicting conditions. One of the more urgent objectives was to replace the Central to Bakerloo interchange passage in the area of the former junction with the Bakerloo Line lift landing (then used as the station masters office) since it was physically in the path the southbound Victoria Line tunnel. In fact the southbound line passes along the course of the former entrance passage and the running tunnel was connected to the former stair shaft via the original cross passage for draught relief purposes.

In connection with the reconstruction of the station, ventilation arrangements were rearranged and a new ventilation plant was built in the former Bakerloo lift shaft just below sub-basement level. At the bottom of the same shaft (replacing the old ventilation plant) a new substation was constructed for the Bakerloo Line-this was commissioned on???, and was the first example of a

substation in such a shaft (a later example was at Holborn).

The most obvious example of the reconstruction was inevitably at street level. It had been decided that the most practicable way for the work to proceed without complete traffic diversion would be for the whole of the new ticket hall area to be bridged, so that work could continue beneath. The bridge consisted of a massive steel deck comprising 245 pieces of separate prefabricated steel work. The deck plates rested on a system of steel girders which in turn rested on 25 cylindrical 3 ft diameter concrete foundations which were sunk to a depth of between 43 and 73 feet during night-time occupation of the road, and temporarily obscured by the road surface. The cylindrical piles had to clear the sites of the main and secondary roof beams of the new ticket hall, the diversionary tunnels for telephone services and water mains, the services which were not to be diverted and various low-level obstructions including sewers, escalators, connecting passages and of course the Bakerloo and Central Line running tunnels which crossed beneath the Circus. The piles were constructed with wide footings to minimise the risk of overturning—some would have at least 30 feet exposed at the upper end during the later stages of ticket hall construction.

The steelwork was delivered to the main working site in Cavendish Square prior to the August bank holiday weekend 1963. On the morning of Saturday 3rd August Westminster City and Marylebone Borough Council staff removed bollards and traffic lights from the circus, and hoardings were erected; traffic was diverted away from the circus at 1.30 pm. Work then started in erecting the huge decking structure. Two gangs fitted the numbered pieces together to a carefully predetermined plan. Some of the existing road surfacing and curbs required removal first and special fittings to receive the girderwork had to be attached to the uncovered piles. Once the main trusswork was in place the decking could be positioned, and when this was done the road surface at the ends of the 1 in 15 ramps at each end had to be built up—the decking pieces were already pre-laid with one and a half inches of road surfacing material. All this was finished by 12.15 pm on Monday 5th August. Numerous other tasks now presented themselves, ranging from installing appropriate signing and road markings, general cleaning up and making good the road surface which would require to be serviceable for some years. At 06.30 on Tuesday morning the traffic diversions were removed and vehicles were permitted use what became known as the Oxford Circus 'umbrella'. A 2-lane carriageway was provided along Regent Street in the southbound direction only; north of

the circus this was on the western side of Regent Street allowing the northeastern quadrant of the circus to be used as a working site. A full width four lane carriageway was provided for Oxford Street traffic, though in a westerly direction only. North and eastbound traffic was diverted away from the area.

The result was a steel umbrella deck, 3 ft 6 inches above the original road surface; in being completely self-supporting it relieved the existing road of its load. Works then proceeded beneath in diverting some of the mains services, and supporting others from the decking. Included amongst this work was the diversion of a major Oxford Street water main and some telephone services into a new service tunnel built beneath the station site with branches leading into Regent Street. The Marylebone sewer (which also ran beneath Oxford Street) was diverted around the north side of the ticket hall site partly through existing, but disused, basement levels of buildings on the northern quadrant of the circus. This done, it was then possible to excavate the new ticket hall area and escalator shafts. It became necessary to bring considerable quantities of materials, including columns, girders and concrete into the ticket hall site. Much of this was done at night and involved the temporary removal of certain deck sections to facilitate access.

To allow construction of the passageway connecting the old and new ticket hall sites it was in due course necessary for the umbrella deck to be extended eastwards along Oxford Street. This happened during the August bank holiday weekend of 1966. Oxford Street was closed just eastwards of the Circus from 2pm on Saturday 27th August when the ramp section outside the former Bakerloo station was removed. Work then proceeded on the erection of a 100 ft long decking extension—31 deck panels on new girdering resting on additional deck foundations. The original ramp sections were then re-utilised at the end of the new section, just east of the old CLR station. All was ready for Oxford Street traffic by 06.30 the following Tuesday. The ramp extension caused the north end of Argyll Street to be closed to vehicular traffic, an arrangement which became permanent.

As all the excavation work proceeded, the load of the umbrella deck was gradually transferred from the temporary piles to new supports which rested on the completed sections of the new ticket hall roof steelwork; the temporary piles were then demolished to leave the ticket hall area clear. When the roof steelwork was complete the permanent roof concrete (and road surface foundation) was gradually installed and the umbrella deck load was again transferred, this time from the roof steelwork to the new road surface founda-

tion, which was a nominal 4 inches below final road level

Having done its job for five and half years the time came to remove the umbrella decking during the Easter weekend of 1968. The area was closed to road traffic at midnight at the start of Good Friday 12th April when work commenced on removing some 900 tons of steelwork with a further 300 tons of asphalt. This was all completed the following day, fully exposing the new road foundation. It was intended to re-open the Circus from 06.30 on the Tuesday morning, but the process of completing the new top surface was completed sufficiently far ahead of schedule to allow traffic to be resumed several hours earlier.

The Southbound Victoria Line station tunnel presented some interesting challenges. The only available location was immediately beneath the "Peter Robinson" store on the northeast corner of the Circus. Many of the footings of the foundations of the building lay directly over the site of the tunnel, though details were not precisely known. Plans suggested that the footings were about 12 ft square and carrying loads of up to 500 tons within a few feet of the proposed tunnel crown. It was clearly essential that tunnel construction avoided the possibility of settlement in these foundations, and this could not be guaranteed with conventional tunnelling methods. It was usual to fill up the void between the tunnel-iron and the surrounding clay by injection of cement grouting, but the clay obviously remained unsupported until the grouting had been injected and had hardened, a method that would be unsatisfactory in these circumstances. It was therefore decided to use a special design of tunnel segment, which could be expanded directly against the clay during construction, thus taking up pressure loads immediately. For several reasons, including that of absorbing the stresses while being jacked into place, the segments were fabricated from mild steel instead of cast-iron.

As an additional precaution against settlement it was also decided to construct a prestressed concrete raft directly beneath Peter Robinson's third basement level prior to driving the platform tunnel. This would further reduce the risks of settlement during the time the tunnel face was passing beneath and had the added advantage of spreading the load from the isolated foundation piles more evenly over the tunnel-in effect making the tunnel itself the foundation footing. The prestressing was required to reduce the chances of the raft shearing directly above the unsupported ground behind the tunnel shield prior to the erection of the segment pieces.

To enable the raft be built a dedicated access heading had to be built, itself forming a further

branch from the worksite heading to the southbound platform site. From this point a pilot tunnel was dug just below-but parallel to-the Peter Robinson foundations. Headings were then made from the pilot tunnel beneath the foundations to embrace the final area of the raft. A succession of narrow headings were then driven adjacent to each other beneath the cross headings and beneath the foundations; these were filled with concrete into which a duct was formed for the reinforcing cables, which were inserted and tensioned after what would become the raft had been completed. Below the raft area itself a weak concrete mix was inserted in the form of a "saddle" in cross-section. When, in due course, the station tunnel was driven it passed through the base of this saddle against which the segments were subsequent expanded to take up the final load. On the subject of the Peter Robinson store it is worth mentioning that an area of the second basement level was requisitioned for use as the access passage and upper escalator landing for the single escalator leading from the new intermediate concourse level to the Central Line platforms.

The final work to be executed before the new ticket hall opened to the public consisted of constructing the station entrances from the pavement in each quadrant of the circus, finishing the installation of new escalators, and completing the architectural finishes in all the new passages and in the ticket hall.

The new ticket hall opened on Sunday 29th September 1968 and everyone (passengers included) heaved a sigh of relief. Quite apart from the new facilities the complete separation of 'way in' and 'way out' traffic produced immense benefits. Initially only two of the top flight of four new escalators were commissioned but even at this stage the station snatched the record for the largest number of escalators at one station (12 of the final 14) from Piccadilly Circus, which had 11. Work then started to adapt the old ticket hall area for its new role in life of serving 'way out' traffic only. The main 'way out' stairway leading from the top of the Bakerloo escalators up to a passage which led to Argyll Street was closed off and demolished to make more room, the area at street level becoming available for letting. The remaining entrances were retained as exits. The lifts were removed, with their ticket hall entrance sealed off and the area at street level floored over and let. The ticket office and all machines were removed and the area re-laid out with new barrier lines. The existing lighting was replaced by fluorescent lighting and all surfaces re-decorated in the Victoria Line style of two-tone grey tiling with stainless steel trim. Two booths were provided for the collection of excess fares and the issue of excess fare

tickets, and six automatic barriers were provided for the collection or examination of the encoded tickets used at Victoria Line stations, although they were not commissioned in time for the opening of the line. Manual barriers were retained for the collection of conventional tickets.

The new ticket hall was equipped with a ticket office directly opposite the bank of upper escalators, and a bank of automatic barriers each side, the two banks starting adjacent to the ticket office and curving round the ticket hall. At the extremities-as far as possible from the ticket office-were situated manual barriers (the object of this arrangement was to encourage ticket purchasers to use the automatic barriers in preference to the manual ones). A large number of automatic ticket machines and a note changer were also provided.

The Victoria Line itself opened on 7 March 1969, following which traffic increased very rapidly. The station rose to second in the league table for passenger traffic entering and leaving the station, and first in the table of busiest stations when interchange traffic was included. During 1971 traffic entering and leaving amounted to some 31 million rising to a peak in 1980 of 49 million-78 million when interchange was included. To handle this traffic many new features were provided at the station.

A station operations room was the focal point for all station operations. Situated in the centre of the ticket hall, but screened off from the public by a one-way mirror, the supervisory staff could see what was going on and communicate with other staff. The latest communications equipment was available, including closed circuit television surveillance and zoned public address facilities. Direct telephone lines were also provided to various key points on station. Special emergency switches were available to stop the automatic Victoria Line trains, to discharge traction current on Victoria Line tracks, and to stop escalators. Passenger Information points were also provided on Victoria Line platforms, also linked to the Operations Room. To provide more accommodation this room was extended in 1982 further into the ticket hall area, darkened glass windows being used instead of one-way mirrors. At about same time a radiating aerial cable was installed around station allowing staff with portable radios to keep in constant contact with the operations room.

Once the Victoria Line opened the station settled in to a state of relative stability, although the automatic barriers were not a great success: the 'way out' barriers were replaced by manual barriers in 1972 and 'way in' barriers were simplified in operation. The Bakerloo Line platforms were relighted and received a finish of grey tiling to match the Victoria Line platforms shortly after the

latter Line opened but the money was not then available for more substantial modernisation; the Central Line platforms were largely untouched and retained their 1900 finish. Once the new ticket hall had relieved pressure on the old escalators they were progressively rebuilt with modern finishings and some new equipment, becoming styled LHD-M.

A concerted effort to modernise and refurbish many busy Underground stations during the early 1980s took on board many former central London stations including the platforms at Oxford Circus. These were resurfaced and the walls completely retiled with 'biscuit' coloured ceramic tiles which completely obliterated the former CLR 'seen better days' atmosphere. The subways remained finished in the Victoria Line style. When completed, work then started on modernising the Bakerloo Line platforms in a manner similar to those on Central Line (but with a snakes-and-ladders theme)-the Victoria Line style finish having not proved very satisfactory. The new Bakerloo Line finished incorporated patterned tiles based on a "snakes and ladders" theme.

During the Bakerloo modernisation several cross-passages were temporarily boarded up for use by the contractors storing materials. During the evening of Friday 23rd November 1984 a fire broke out in one such passage adjacent to the northbound Victoria Line platform. The fire eventually ignited some inflammable material that caused it to grow rapidly; flames soon emerged from grilles in the upper partition, where they lapped against the melamine panels suspended from the tunnel roof. In a relatively short time the whole of the tunnel roof was ablaze and a huge conflagration resulted with dense black smoke filling many of the passageways and soon belching from the station entrances. All three lines were shut down, though fortunately no lives were lost and there were no serious injuries. The Central Line resumed the following morning followed by the Bakerloo Line later in the day, though not stopping at the station until 30th November. The Victoria Line platforms were so badly damaged that the line was closed between Warren Street and Victoria until 17th December. One of the problems had been that the tunnel crown had been waterproofed with sheets of "cellactite" which was material incorporating asbestos on a bitumen base. The bitumen had burnt fiercely in the fire releasing asbestos into the atmosphere, all of which required the ceiling of the platforms and specialist clearance procedures before remedial work could even be started. The northbound platform tunnel was stripped right back to the tunnel segments when the line reopened and the work of installing new finishings started towards the end

of 1985, being finished in 1986. The new finish was closely based on the Victoria Line basis, though metallic, rather than melamine, panels were used for the roof.

This broadly brings the story of the station up to date {as it was in 1989 - what has happened since}, although it must be appreciated that this

article can only deal with highlights. A busy railway station handling hundreds of thousands of passengers a day is an eventful place and one full of difficulties, incidents, crises and humour-all of which have to be dealt with all of which are part of the history.

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