

The Post Office (London) Railway

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Introduction

The subterranean railway also known as Mail Rail was originally opened in 1927 and for over 75 years operated, unseen by most, beneath the streets of London connecting Central London District Offices with two of London's principal railway stations. In 2003 with declining use, the railway was mothballed and then lay abandoned and largely forgotten save for a small number of people committed to preserving the memory of this amazing piece of hidden industrial archaeology.

In 2015 The Postal Museum, which was at that time working to open a new purpose-built museum in the centre of London, began work to make part of the railway accessible to visitors in a way that had never been done before. The railway was built to carry post, not people, and the project to make a small section a visitor attraction was no easy task. With its associated exhibition, it was eventually to cost £26 million and created the Mail Rail ride which allows visitors to travel over a short part of the narrow-gauge railway network from the original maintenance workshop, down to the platform under the Mount Pleasant Mail Centre and back. When it opened to great acclaim in September 2017 visitor numbers proved the public's deeply held fascination with this unique piece of London's industrial history.

This article explores the history of this railway, how and why it was developed and how it operated and celebrates the fascinating history and the people that worked there.

The need for an underground railway

London is and always has been the centre of the postal network. It was in London that the GPO was established and has always had its headquarters. For much of its history, the nation's post has come through London. Prior to the formation of the cross-post system, mail going just about anywhere would most likely have come via the capital and it is truly fair to say that, for the Post Office, all roads led to London.

As the hub of postal distribution, the capital has increasingly been a place where post has had to traverse the city. Mail has never just arrived in London, been sorted and left by the same route; there has almost been a corridor through the city that the post has travelled along, often being passed from one end to the other.

The railways were an incredibly important tool for nationwide mail distribution and with their arrival in London this cross-London transportation became vital. Often, of course, the railway termini that were constructed in an approximate circle around the heart of London were not in the same places as the offices where mail was sorted and processed. Part of the post's journey therefore needed to take place by road, taking it from offices such as Mount Pleasant to railway stations such as Paddington and Liverpool Street.

Grid-locked roads and frequent delays due to sheer weight of traffic is considered a modern plight, a consequence of increased reliance on road transportation, wider car availability and increasing population. Many might imagine that 100 years ago it was all very different. While of course the means of road transportation was different, relying truly on horse power, traffic was not as free-moving as one might imagine. Jams were common and the journey time across London was often lengthy. In 1909 the average journey time from Paddington to the GPO was 37 minutes and from Paddington to Mount Pleasant 32 ¼ minutes; the average speed never rose above 6.5 miles per hour. Robert Bruce, the Controller of the London Postal Region, questioned 'Whether it will ever be possible to obtain an average reliable speed

of over 8 miles an hour during ordinary business hours in Central London even with motor vans is a matter of extreme doubt'.¹

The Post Office was needing to move more and more of its mail across London and by the beginning of the 20th century the roads were causing increasingly serious delays to the movement of mail. To understand the story of the Post Office (London) Railway and the idea of underground movement of mails, it is however necessary to go back to the 1850s.

Early schemes

In a minute dated 29 June 1855, Rowland Hill, then Secretary to the Post Office, submitted a report to the Postmaster General on a system for conveying mail in underground tubes.² The proposal was to connect Post Office Headquarters with an office at Holborn and up to eight other offices, linking them together with a line of tubes that were to be used to propel mail along their lengths with pneumatic power. Despite two engineers, Mr Gregory and Mr Cowper, confirming that the idea would work, the cost meant that the proposal got no further than discussion at this stage.

Within 10 years however the idea was partially realised when the Post Office inspected a new pneumatic railway, built by the Pneumatic Despatch Company. It ran nine feet below ground between Euston Station and the North West District Office at Eversholt Street. Mail was carried for the first time by pneumatic tube on 17 February 1863; it was loaded into specially built wrought iron cars, and the cars, running on rails, were propelled the length of the tunnel by air, generated by huge onsite generators. The Post Office was reluctant to buy into the scheme and the trial was suspended in 1866. The line however was later extended through Holborn to the GPO at St Martins Le Grand and the service was recommenced on 1 December 1873. Again, the Post Office declined to commit and mail was carried for the final time on 31 October 1874.

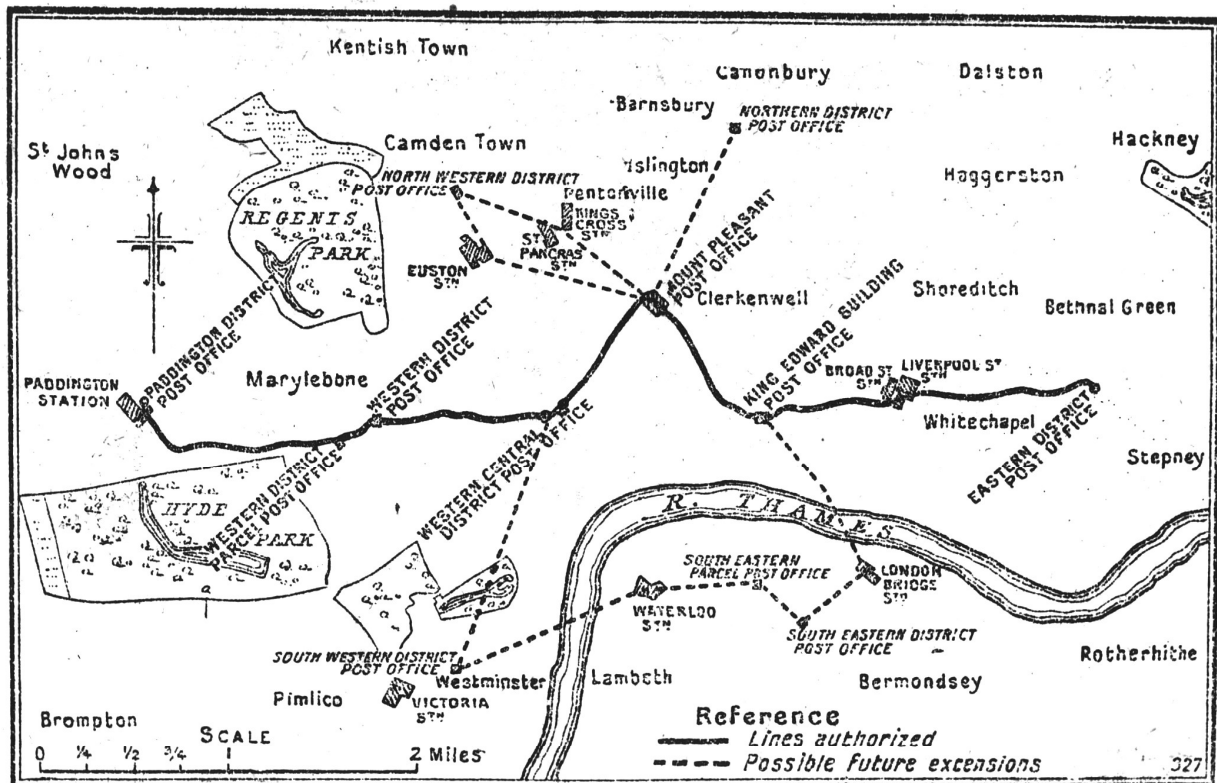
This period of experimentation perhaps marks the high point of pneumatic mail transport starting with experiments going back to 1667 and continuing right up to the 1909 commission set up to investigate fully the possibilities. The ideas – which included a continuous flow of cars running underground, connecting all the letter boxes with the sorting offices so that letters, when posted, dropped straight into the trains and on to the offices, and a pneumatic railway running under the English Channel connecting Britain and France – are summarised in a historical précis of schemes for the underground transmission of mails compiled by the Post Office as an accompaniment to the 1911 committee report.³

By the turn of the 20th century however the journey times across London above ground were so prohibiting that once more an alternative solution was considered. The continued discussion and experimentation with pneumatic railways led the Post Office to revisit the idea. Robert Bruce saw for himself pneumatic railways in use in the United States of America and in Chicago he saw an electric powered railway used for transit of heavy mails. In 1909 Bruce was commissioned to produce a report considering the alternatives and comparing pneumatic and electric railways.

His report published in 1911 offers the best and most detailed summary of the case to date.⁴ It explores the various plans considered to date and details the underground networks in use, or proposed, for other countries. It concludes that there is much to be said for the narrow gauge electric railway in Chicago but identifies serious draw-backs, including the vast number of interchanges and stations and the fact that it was used, not just by the Post Office, but by commercial companies for deliveries to shops and warehouses, this posing a problem for the security of the mail.

Bruce acknowledges a number of advantages to a pneumatic railway but concludes that a far more practical solution for London lies with an electric powered railway. He recommends the construction of an underground railway, solely for Post Office use, connecting the Eastern District Office with Paddington, linking together six other stations on route, five sorting offices and Liverpool Street station. Thus the idea for the Post Office (London) Railway was born.

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Designing the railway

The Post Office quickly gave approval to the idea and as a Government department it was also necessary to seek approval of the Cabinet and Parliament. A Bill was put before Parliament and was scrutinised by a select committee of the House of Lords. The Lords heard appeals, requests and concerns from a number of quarters, not least the companies operating London's underground passenger railway. Their fears of a state run competing network led to the inclusion of a clause banning the carrying of passengers on the railway. Eventually the Bill was passed and the Post Office (London) Railway Act 1913 entered the statute books where it remains to this day.

Passing the Act of Parliament did not end the legal disputes and discussions, however, and legal challenges, disputes and easements continued well into the construction. There was much concern from home and business owners under whose premises the tunnels would pass and within the Royal Mail Archive there are files of legal papers dealing with easements of people's property concerns.

Even before the Bill had passed through Parliament and the legal disputes were resolved, the Post Office began planning the construction. One of the leading underground railway engineers of the day was appointed as consulting engineer on the project, Harley Hugh Dalrymple-Hay. Dalrymple-Hay submitted a report to the Engineer-in-Chief of the Post Office in 1912. It was accompanied by a series of drawings detailing construction methods for the tunnels and setting out a time scale. The Engineer-in-Chief in turn submitted a report to the Secretary of the Post Office later that year formally proposing the scheme for the underground transmission of mails.⁵

Meanwhile trials of electric powered railways were taking place. On 22 March 1912 the Post Office observed a remote-controlled electric railway being tested by the British and Colonial Pneumatic Tube and Transport Company in Chelmsford, Essex. The test track was set up in the grounds of Messrs Crompton and Co. Ltd. The railway was powered by direct current as the Post Office's own railway was later to be. It comprised about half a mile of track arranged in a loop with a short length of ferro-concrete tunnel. It had a small station at one end. Rolling stock was designed to accommodate the largest parcel

accepted by the Parcel Post of the time. Each wagon was on a 4-foot 6-inch wheel base and ran on a track of 16-inch gauge.⁶

Following this, a further trial was set up by the Post Office itself at Plumstead Marshes on ground owned by the Royal Arsenal at Woolwich. Dick Kerr and Co. Ltd were given the contract for the construction of the line after receipt of tenders. Kerr subcontracted the construction of a timber building for use as a station to A. W. Gamage Ltd. The station building was 18 feet long by 20 feet wide and 8 feet high to eaves and 12 feet to ridge. Exact details of this trial are not clear and it has been disputed by some, but records within the Royal Mail Archive clearly identify the trial as having taken place.

The Post Office Railway – its operation

Before exploring the construction further, it is important to consider what the Post Office (London) Railway became.

The railway extended from the Eastern District Office on Whitechapel Road in London to the Paddington District Office (or more recently the West London Mail Centre). Its principal function was connecting these points and intermediate stations, linking together, away from the congested streets of London, the principal district and sorting offices and some of the mainline railway termini serving the Travelling Post Offices. It ran in total over 6 miles. After leaving Eastern District Office it originally went next to Liverpool Street Station, then the East Central District Office (King Edward Building), Mount Pleasant Sorting Office, West Central District Office at Holborn, Western District Office at Wimpole Street, Western Parcels Office at Baker Street before arriving at Paddington District Office where it connected with the railway station. In 1965 the Western Parcels Office and Western District Office were closed, and a new station was cut into the network at the new Western District Office at Rathbone Place. This later station is very different from the original ones which were constructed simply by widening the bore of the tunnel. Rathbone Place is a box shaped station and looks more like the office block basement it is than the tunnels of the older stations. A new section of track was laid through to the new station deviating off the original line before rejoining it on the other side.

For most of its length the line is within a single bore tunnel of 9 ft diameter with the tracks running side by side. At the approach to stations, the lines are split into two 7 ft tunnels before emerging into 30 ft tunnels in the stations. Track layout within stations varies with a 'permanent way' on the outside for through trains and scissor crossovers, to connect to the platform berths. Several of the stations also had loops, allowing trains to be turned around.

Trains could be stopped at any station for loading or unloading of mail or could be run straight through stations where required. Mail was loaded in bags or trays into special containers which were then loaded onto the trains. The destination of the bags of mail was identified by special bag labels, each with a number relating to a particular station. Mail was sent down to the platforms from the offices above on chutes and conveyed back up into offices or stations on conveyors or elevators or using the lifts. At Paddington a conveyor system was used to get bags of mail from the Post Office Railway directly onto the mainline station platforms, the longest of these conveyors being 390 ft. Today the tunnel they were in remains but the conveyors themselves have been removed.

The technical aspects of the railway have been well covered by both Derek Bayliss and Leonard Stanway⁷ and so here I will only offer a simplified appreciation of how the system worked.

The Post Office (London) Railway is a narrow gauge underground electric railway. It runs on tracks set at 0.6 m gauge. Trains are driverless and are controlled by varying the power sent to the train and setting and proving of points. In tunnels, the trains are powered by 440 volts DC supplied by a third rail and when in stations power is dropped to 150 volts. At the approach to each station track is laid on a slight incline which, when combined with the power change, slows the train sufficiently to bring it to a stop



against the platform. 440 volts are then used to start the train moving which then runs at 150 volts again until it leaves the station when the train hits the decline and power is again raised to 440 volts.

The routes of the trains were controlled from the line's opening in 1927 until the early 1990s by switch frames operated in sections at each station. Each platform had a cabin, much like a signal box on the mainline railway. The switch frames that sat within these cabins worked just like the mainline points levers, except on a smaller scale. Each station would control a section of the line east and westbound out of its centre and was then linked to the section controlled by the neighbouring station. The levers on the frame moved out through three positions and back in through three which threw the points and proved them before determining the route of the train. As a final check a train could only leave the station when passed as safely loaded and with all ramps closed by the postal worker on the platform. The postal worker pressed a button that activated the train ready relay and put the train under automatic control. Once the train was under automatic control it would depart the station as soon as the route ahead was clear; because this might not happen immediately a red light above the track indicated that the train was under automatic control and liable to move any moment. This red light gave rise to the nickname of 'the cherry' for this control process.

In the 1990s the route setting and control was taken over by a computer and the switch frames made redundant. Final release of the train remained with the postal worker on the platform.

Construction

Returning to the construction of the railway, work began in 1915 by John Mowlam & Co. with the sinking of bore holes along the length of the line. It was intended overall construction would be completed in 15 months. This time was extended considerably, as shall be discussed, by the First World War.

Construction began and tunnels were cut fairly rapidly under the streets of London. Methods employed by the Consulting Engineer, Dalrymple-Hay, were modelled on his work on the tunnels for the Bakerloo line on the underground passenger network. The tunnels were lined in sections with iron cylindrical



sections bolted together, the diameter of the rings varying as required in the stations and the approach to stations. Few problems were encountered until the tunnels were approaching Mount Pleasant, most particularly at the junction with Calthorpe Street and Phoenix Place where problems of water ingress occurred. According to *The Times* on 10 April 1915 ten men constructing the tunnels had to run for their lives with the sudden inundation of water caused, it was suspected, by the River Fleet running near to this spot. Here extra lining was required and throughout its history water ingress remained a problem with a concentration of sumps used in the area to pump the water out. This locality also sees the watertight flood gates: a set of heavy duty gates within the tunnel just outside Mount Pleasant station. In the event of a flood, these could be shut preventing inundation of the entire network. These gates were not part of the original construction but were added in 1943 due to fear of flooding caused by wartime bombing.

The outbreak of the First World War did not lead to instant suspension of the works, but discussions were had, not just on the temporary suspension of the construction during the war, but on the entire abandonment of the scheme.⁸ Questions were raised in Parliament and eventually construction stopped in 1917. By this point no work had been done on electrification but the basic network of tunnels was in place. So much so that for a time treasures from national collections such as the British Museum and National Portrait Gallery were stored here for protection from enemy bombing. Work was eventually re-started in 1924 when electrification of the network began.

Throughout this process reports were submitted to the Secretary of the Post Office giving regular updates on progress. Those wishing to explore the construction in greater detail are directed to these records, preserved in the Royal Mail Archive.⁹

Rolling stock

While work on the infrastructure was underway, development of the rolling stock was taking place. The first batch of 90 wagons was produced by English Electric. Differing significantly from later rolling stock these were four wheeled, rigid bodied wagons. Problems were identified with the design from a very early stage and, as the first trains began to run when the line opened, it was quickly realised that

excessive wear was occurring to the tracks by the turn of the train, made worse by the rigidity of the body. The problem was perhaps best summarised and a solution offered by Evan Evans, the first Post Office Railway Manager, even before the line was opened. His proposal for a bogied wagon which could turn better and allow for a longer train thus accommodating more containers was to become the standard for the rest of the life of the line, but his suggestion on 24 October 1927 was rejected by the Secretary of the Post Office on the advice of the Herbert Gunton, Power Engineer on the network.

By late 1927 the line was eventually ready for use. The first trains ran just in time to help with the Christmas pressure between Mount Pleasant and Liverpool Street. On 2 January 1928 the entire line was at last open. The network was then to remain in pretty much constant operation until its closure in May 2003.

For a system that operated for over 75 years, the Post Office (London) Railway was to undergo relatively few changes in its rolling stock. As has already been explored the original rolling stock introduced for the opening of the network in 1927 was quickly found to be wanting. Trials with new stock in 1928/9 led to the introduction in 1930 of an entire new fleet of trains very different to the four wheeled 1927 stock. The 1930 stock proved much more reliable and suited to the task and by 1936 further batches of these trains were being ordered. In 1962, experiments took place and two trains of a new design were introduced to the network, the first being delivered on 26 November 1962. A number of problems and failings were identified with these but the need for replacement stock was identified and complaints were received from the PO(L)R over the time taken on the trial. A real need was beginning to exist for replacement stock as the 'existing stock is in a very poor condition and has served its useful life'.¹⁰ It was the late 1970s however before a new fleet was developed. The trains that were to be in use until the suspension of the service were introduced in 1980 and were made by Greenwood and Batley, known as Greenbat, based in Leeds. The company was taken over by Hunslet Holdings soon after but continued to produce cars marked with the Greenbat name.

Operation

The introduction of the 1930 stock trains might, it may be argued, marked an almost settling down period for the PO(L)R. The system was now using a type of train and operating method that was to remain little altered until the 1980 developments described. The one notable exception to this was of course the Second World War which was to witness loss of life and damage to the PO(L)R. Perhaps somewhat surprisingly the network remained in use during the war (albeit with reduced hours at times) and was only suspended for brief periods when forced to by damage. The Manager's Reports through the war recount the stoppages. Perhaps the most telling example of this was the damage sustained to Mount Pleasant on 18 June 1943 by enemy action. A direct hit by a bomb destroyed the Parcels Block at Mount Pleasant and flooded the station at the Mount killing two workers. Most remarkably however the disruption to that section of the line remained only until the next day, a measure of the skills of the railway engineering staff.

As previously mentioned, a new station was built in 1965 at Rathbone Place to replace two of the original stations and, after the introduction of the 1930 stock trains, it can be said that this was the next period of significant change on the network. It was followed by a re-branding exercise in 1987 to mark the railway's 60th anniversary. Trains were re-painted in Post Office red and some had a special cowling added to streamline their design. Most significantly the network was renamed Mail Rail, a name that has retained greater popularity and affection despite the fact that it was known as the Post Office (London) Railway for 60 years but as Mail Rail only since 1987.

Engineering

Perhaps the most remarkable fact about Mail Rail, as it may now be called, was its total self-sufficiency. It was completely its own community. From its own postal, cleaning and railway staff to its own team of Royal Mail engineers. It was never outsourced as other parts of the business were. During the height of its working life everything it required was provided in house. After the tunnels, tracks and trains were provided everything else was done by its staff. The Car Depot at Mount Pleasant was its workshop; here trains could be brought, if not under their own power then pulled by the battery locomotives, and be maintained, serviced, repaired or entirely rebuilt. Every skill required could be provided in house and the Car Depot was equipped with machine tools for all engineering needs, with motor test beds and with train inspection pits. The inspection pits were something that were added later to the designs for the depot by Dalrymple-Hay at the request of the Post Office. It was also through the Depot that the only access to the outside world was provided for any large equipment. A hoist system was, and remains, in use at the Depot to get trains and other larger items in and out. In the 1990s when a computer took over the running of the network even this was maintained by Mail Rail engineers. The control centre moved around but by the close of the service was situated on the fourth floor of the Public Office Block in the Mount. Here a bank of monitors oversaw the railway which was all controlled by a 256-megabyte computer. The Post Office (London) Railway was truly a community of its own and a remarkable survival in its time.

Perhaps most importantly, it is vital to remember the contribution of the people. The engineers who kept the system running, safer and more reliable than any other railway in its time. The postal workers who loaded and unloaded the trains and ensured the mail was passed up to the offices and stations above ground and the support staff such as the apprentices and cleaners. Perhaps it is important to note some of the significant individuals in the railway's life.

Sir Robert Bruce was Controller of the London Postal Region and appointed as Chairman of the Committee set up in 1909 to investigate the possibilities of underground transmission of mails. He visited similar systems in use in other parts of the world and it was through his report that the PO(L)R was envisaged.

William Slingo was an electrical engineer and was Engineer in Chief at the Post Office during the development of the railway. It was Slingo who appointed the Consultant Engineer Harley Hugh Dalrymple-Hay and who made regular reports to the Post Office, most significantly to the Secretary of the Post Office.

Harley Hugh Dalrymple-Hay was the principal architect of the Post Office (London) Railway. A civil engineer, he had been involved with railway construction for over 30 years when appointed by the Post Office as Consultant Engineer. He was resident engineer with the Waterloo and City Railway and principal engineering assistant on the original section of the Baker Street and Waterloo Railway (Bakerloo Line); it was from this appointment that he based many of the ideas for the PO(L)R.

Herbert Charles Gunton was appointed in August 1909 as Principal Power Engineer to the Post Office and reported to the Engineer in Chief. He worked closely with Dalrymple-Hay in developing the railway and was responsible for working on the powering of the network.

Conclusion

Together these people, and all those who worked on the railway or supported, it kept a vital system in operation streamlining the operation of the postal service and helping to keep the country connected through the post.

Today The Postal Museum acts a guardian of a small stretch of this line and allows visitors for the first time to explore the story of this truly remarkable railway.

The author

Chris Taft is a historian and Head of Collections at The Postal Museum. Chris has researched widely on the history of the Post Office underground railway and has for over 14 years been involved with a number of projects, including opening up part of the railway to visitors with the new Postal Museum in London.

Notes and references

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