

Mind the Gap ! (Jan 10th 2020)

I expect you will all have experienced this! (video clip) I think this is Embankment, where you will see some of the worst platform gaps. These are among the hazards of the London Underground, which new projects attempt to minimise



Cross Rail is often in the news. It's costing 15 billion and much delayed. Here's an impression (video clip). You'll notice a wheel-chair user entering easily. You'll see the indication of air-conditioning. And the train finally arrives at a safe screened platform with platform doors.

It's far less well known that over 16 billion pounds, even more than crossrail, is also being spent on programmes to modernise the deep tube network in London. The largest project is known as "New Tube for London".



But this is how it all started.

The history interests me because of my own recollections going back to the 1930s and 40s. The deep tube lines were not that old then. The earliest parts of the London Underground were shallow cut and cover tunnels - the Metropolitan, District and Circle lines. They started with steam locomotives.



Electric traction was then adopted - and was the trigger for the building of the deep tube lines in around 1900 by private companies.

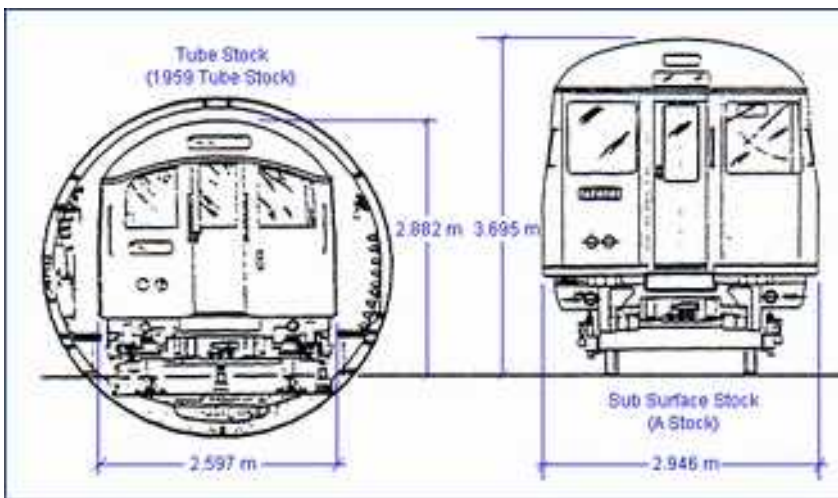
Today's unified Underground System with 270 stations goes back to 1933 when the private underground and bus companies were absorbed into the London Passenger Transport Board, and ambitious expansion plans were soon under way. Of course there have been lots of changes since then, including building new lines, but the London Underground system is still handicapped by the age of its underlying structure and piecemeal development.

A brief reminiscence will set the scene and bring out a few points.

As a small child, pre-war, I lived in North London. The local station was Woodside Park, and I was taken on the suburban steam trains which were part of the LNER inner suburban network. The tube didn't cover this area, and the Northern Line did not yet exist as such. But the New Works programme started in the 1930s changed all this. One portion was a new tunnel to link the existing Highgate tube station to the surface lines at East Finchley, and as a small child I sometimes watched the building of the tunnel entrance very near my grandparents house. Eventually I was taken on one of the new tube trains, and I remember how small the tube train seemed as it came into the overground station.



You can see it here - a Metropolitan line train, much the same size as a main-line train, and a tube train. They run on the same rail gauge. The big difference is that the larger trains have compartments with floors which are entirely above the wheels, whilst in the tube trains, the compartment floor is between the wheels, and the wheels actually run behind the seat-backs. And the tube trains are narrower, fitting a circular tunnel.



The new Northern line of 1937 with its extensions went on through central London with a split route - to the west end of London beneath Tottenham Court Road and also to the City via Moorgate. That's unusual. All the other tube lines consist of a single route through the busiest part making it much easier to achieve a frequent peak service.



On the Northern line, Camden Town is a bottleneck with its famously complex tunnels., with old stations dating back to 1900.



Many had the old Otis lifts which I remember well. These were oddly shaped. A pair of lifts ran in a large circular shaft, and to maximise capacity, each was a half hexagon. Each would take 70 people.. By the 1930s, many of them were automatic, and the Bostwick gates closed after "Stand Clear of the Gates" was announced. They were gradually removed, with the installation of escalators and more modern lifts, but, quite remarkably, they remained in use at Aldwych until 1994.



Here is Aldwych station in 1994, just before it closed. [\(video clip\)](#)

"Mind the Gap" was the other loud announcement at some stations - and unlike the "Gates" announcement, it is still heard - and seen.

So we come to the modern era, and the factors which influence new developments.

First, there's coping with the demand, which is increasing year by year. The capacity obviously depends on the passengers-per-train, and the achievable trains-per-hour. New trains will have more internal space. Improved signalling is allowing closer spacing of trains, exceeding 30 trains-per-hour. Transport-for-London claim that the Piccadilly Line capacity will be increased by 60%. A more drastic change is required for the Northern Line, because of the Camden Town junction. It is expected that it will be split into two separate lines with a passenger interchange between them at Camden Town station, which has to be rebuilt first. Of course platform length is a

factor. The two newest tube lines, Victoria and Jubilee, can accommodate longer trains.

Next there are the connected issues of safety and accessibility.

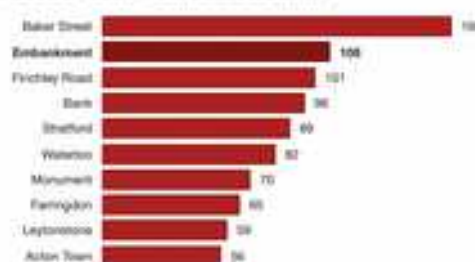
First of all, open platforms are obviously hazardous, especially when platforms are crowded. Of the older lines, only the Jubilee Line has platform doors



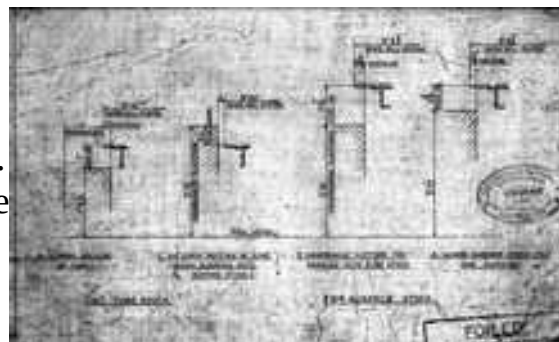
And the system is beset by platform gaps that were accepted in the past, but which we now regard as dangerous. It is not reliably wheel-chair friendly, even with recent improvements. More modern systems in other world cities are far safer. In 1900 we did not have today's emphasis on Health and Safety. and we had a haphazardly designed city. Today's stylised tube maps are very misleading. The actual routes of the deep tube are far from straight, and many stations are located on curves in the line. When a train stops at the platform on such stations, there will inevitably be horizontal gaps, either at the ends of the carriages, or at the centre. Hence "Mind the Gap".

Mind The Gap

Total number of falls down the gap at stations since 2003



This engineering diagram from 1978 shows how the platform heights were determined. On the right is a full height platform for big trains, giving a step up to the level of an oversailing sill. If tube trains used such a platform there would be a huge step down. On the left is a standard tube train platform, with a similar step up to an oversailing sill. But there are parts of the network where both sizes of train run. So a compromise height is used, giving a step up for big trains and a step down for tube trains. There is bound to be a horizontal gap to cross



These days transport accessibility for all is hugely important. And platform gaps need to be negotiable by wheel chairs. So how can that be achieved economically? At some stations, humps have been created for level access at door locations, and at others, movable ramps are available. But the big gaps at curved platforms pose a real problem. and that is actually made worse if the train floor is level with the platform. One approach is to provide gap-fillers. The most sophisticated are intelligent ones, either mounted on the train or on the platform, which move automatically into position. .

Another approach is to get the train to hug the curve more tightly. London is replacing its train-fleet, starting with the Piccadilly Line. The new trains will be semi-articulated. I don't know precisely what that means, but this film gives the general idea. [\(video clip\)](#)

The London Underground has travelled a long way since the bucolic visions of 100 years ago.

