

London Orbital network takes shape

London Overground improvements are coming thick and fast, TfL's London Rail Chief Operating Officer Howard Smith told James Abbott

London's outer ring rail has come a step closer with the completion of the infrastructure of the extended East London line. Testing of trains on the rebuilt line commenced on 5 October 2009, with two trips per day running from south London to Dalston at a maximum of 40mph.

In mid-October, three Class 378s were present at the new Silwood depot near New Cross Gate. The test trains are initially operating on the 'one engine in steam' principle, while preparations are made for the commissioning of the signalling on the line, which will be controlled from the new control centre at Silwood.

The final touches are being applied to the stations on the route, with items like the ticket gates being left until the last minute to avoid damage by contracting teams going up and down to the track.

In January, the main contractors for the project, the Balfour Beatty Carillion Joint Venture, will hand the line over to the operators, to allow time for driver training and bedding down of the train service prior to opening to the public on 23 May 2010. 'The project is running on time and we expect it to be on budget' reports Howard Smith, Chief Operating Officer of Transport for London's (TfL's) London Rail division.

While the BBCJV has been busy north of New Cross / New Cross Gate, Colas Rail has been working for Network Rail, preparing the infrastructure south of New Cross Gate for the East London services which will penetrate to West Croydon and Crystal Palace. A blockade over Christmas will see the commissioning of the new layout at West Croydon, where the track has been adapted for East London services, and a new crossover at South Croydon to ease operations in the area.

At Crystal Palace, the track and platform area will be ready for the new service in May, but changes to the station building are expected to come a little later. 'This is the one outlier in the whole scheme' says Mr Smith. Rather than going for a few simple changes to accommodate the new service, TfL and partners in the industry have taken the admirable decision to do the job properly. They are seizing the opportunity to make the most of the listed station building, a cavernous structure with dramatic spaces built to accommodate the vast crowds that used to visit the Crystal Palace exhibition hall before it burnt down in 1936.

Under the scheme now envisaged, the 'conservatory' – the 1970s structure insensitively stuck on the façade that has acted as a ticket office – is to be demolished, and the original ticket hall restored to its former purpose. 'It is an £8million job – a big and ambitious scheme' reports Mr Smith.

The East London line has been electrified on the Southern 750V DC third rail system, to facilitate through running from south London. The signalling is controlled from Silwood, fringing with London Bridge panel at New Cross and New Cross Gate and (eventually) Upminster Integrated Electronic Control Centre at Dalston. The technology is conventional Solid State Interlocking supplied by Invensys Rail.

While the technology on the route is for the most part tried and tested, one novelty on the East London line is that this is expected to be the first route using in anger the new GSM-R standard track-to-train communication system. The pilot GSM-R project in Strathclyde has been overlaid on an older system, which has been there to act as a fallback – whereas on the East London route

GSM-R will be the only communication system. GSM-R will not, however, be performing a vital safety role here: conventional lineside signals remain for control of trains.



East London line extension project contractors

Main contractor	Balfour Beatty Carillion Joint Venture
Technical adviser	Mott MacDonald
Programme Management Services	Parsons Brinckerhoff (Balfour Beatty) and Davis Langdon
Multi-disciplinary design	Scott Wilson
Enabling works	Taylor Woodrow (Vinci)
Alterations to Network Rail infrastructure for southern extension	Colas Rail
Power supply	EDF
Signalling	Invensys
Class 378 rolling stock	Bombardier



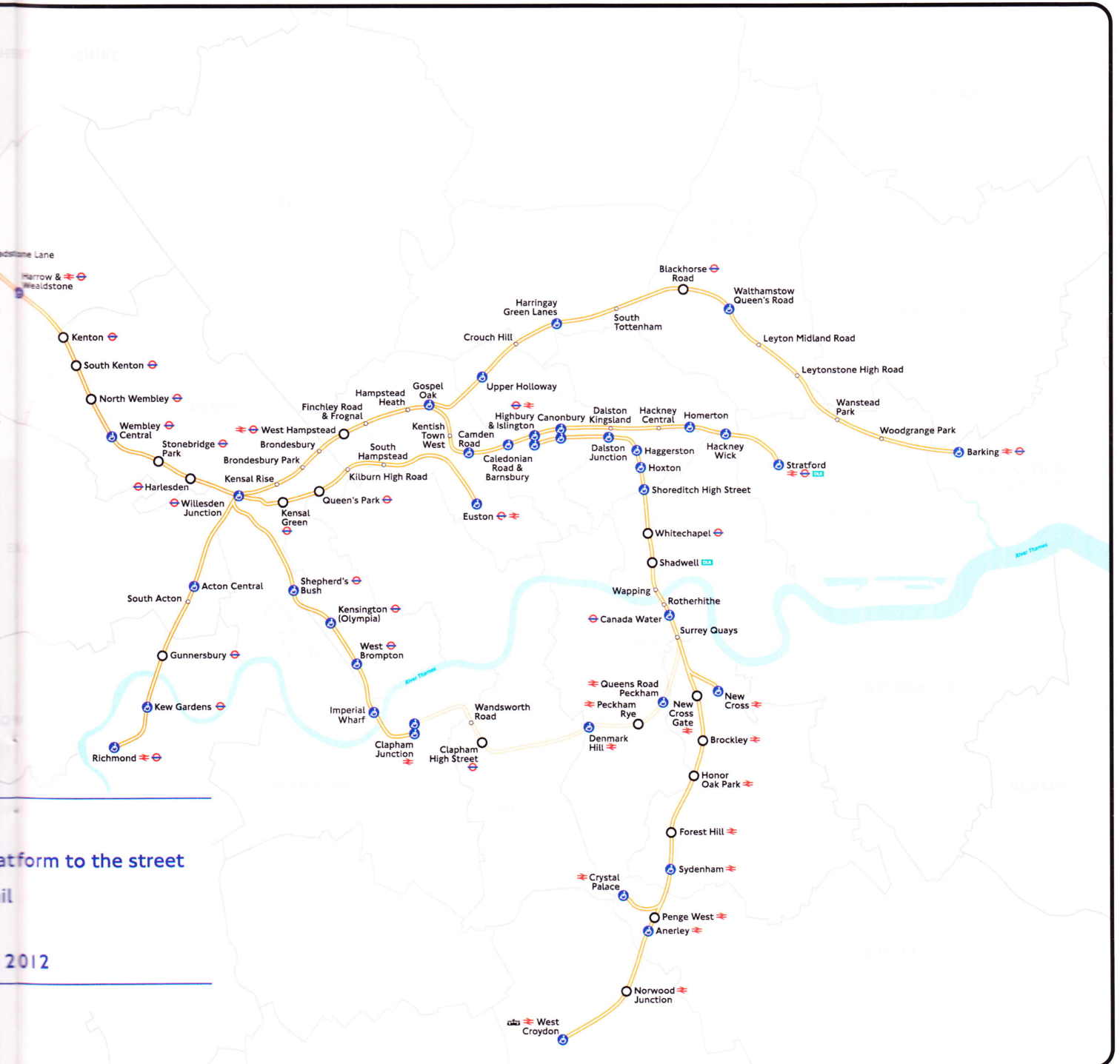
TfL will be responsible for the maintenance of the core part of the East London line: a contract for this has been let to Carillion.

Traffic

In May, there will be a train every quarter of an hour from each of the three southern termini, at New Cross, Crystal Palace and West Croydon, with the latter two in particular expected to be busy from the outset. Commuters from south London and further afield will be using the new trains to reach offices in Docklands and the City.

A change at Canada Water onto the Jubilee Line will give easy access to Canary Wharf, while other parts of Docklands will be accessible by changing onto the Docklands Light Railway at Shadwell.

A test train on the East London line runs across the bow string bridge over Shoreditch High Street. *Courtesy TfL*



Whitechapel will give interchange with the District and Hammersmith & City Lines, and in years to come with Crossrail as well.

Shoreditch High Street station is located next to Bishopsgate and is just a short step from the Broadgate area of the City. Planners toyed with the idea of naming the station Bishopsgate to emphasise this (and there was also pressure to opt for 'Brick Lane' to underline the accessibility of the area to the east of the line), but in the end 'Shoreditch High Street' won out.

New stations on the former Broad Street line viaduct will be located at Hoxton and Haggerston, and initially the line will terminate in the north at Dalston Junction. Patronage expectations are modest here for the beginning of the service, as going south has traditionally been difficult for this area so there are few existing flows to attract to the railway. But a new multi-use development is going up on a raft over Dalston Junction station, which will be a traffic generator, and historically Londoners have been shown to adapt their habits quickly to new public transport facilities.

The big boost at the northern end of the line is expected to come in 2011, when East London line trains go 'round the corner' to Canonbury and terminate at Highbury & Islington. Here, interchange possibilities with the Victoria Line, North London services and First Capital Connect trains from Moorgate are expected to prove traffic magnets.

Phase II

Earlier this year, London Mayor Boris Johnson gave the go-ahead to East London Line Phase II, an extension from Surrey Quays over the South London line to Clapham Junction. In the Network Rail investment process this has been progressed to GRIP Stage 3 by the Jacobs consultancy, while Parsons Brinckerhoff has been working for TfL. It is now moving to GRIP Stage 4, with tenders for construction work expected to be called in the first half of 2010.

At its eastern end, Phase II will follow the route of an old railway that is currently a footpath to link the East London and South London lines. TfL is to let the tender on this link, which will involve the completion of a grade-separated junction onto the East London line at Silwood.

A new station on the link at Surrey Canal Road is a possibility, although this is not yet funded. As the name implies, the road is built in the bed of an old canal, so it is below ground level and there are utilities below the road surface. This makes an elevated station the most likely solution if a station does end up being built here.

A new junction, Old Kent Road Junction, will mark the point where the new link joins the existing South London line from London Bridge. Few changes are required to the Network Rail line running west to Clapham Junction, save for at the latter station where provision must be made for the East London trains to turn round.

East London Line Phase II is expected to open in 2012 before the Olympics (provided the Clapham works are finished in time) and the four-trains-an-hour service is expected to prove a boon when work starts after the Games on the rebuilding of London Bridge for the Thameslink Programme. Network Rail

had already said the half-hourly Victoria-London Bridge service on the South London line will be withdrawn in 2012 to facilitate the work at London Bridge, and the new East London line service will help fill the gap.

Attracting some controversy has been TfL's decision not to provide the Victoria-Bellingham service once mooted as a partial replacement for the Victoria-London Bridge service. Although the East London line service will provide a more frequent service on the core part of the South London route, it will not serve central London termini.

North London progress

The North London line is seeing restoration of four tracks between Dalston and Camden Road to accommodate the East London service and to give extra capacity for both freight and passenger trains on the North London route itself. The core part of the line, in a brick cutting known as 'the canyon', is being rebuilt – as described in the July issue (p51).

Preliminary work has been concentrated under the track. Not only was there a dilapidated sewer which needed replacement, also Victorian wooden struts inserted to keep the brick walls apart when the line was quadrupled need replacement with concrete beams.

A four-month closure of the route in the first half of 2010 will see the main works taking place, with the restoration of the northern pair of tracks for North London services in July to allow work to proceed on the southern pair for East London line services in the second half of the year. In July next year the stations on this section will be able to accommodate four-car trains, and the project is due to conclude in January 2011, when East London services are expected to be extended to Highbury & Islington.

As part of the project the line is being resignalled, with the route westwards from Stratford up to the present boundary between Willesden and Acton Wells boxes due to

North London improvement works contractors

Main contractor	Carillion
Signalling works	Atkins
Hampstead Heath tunnel gauge enlargement (complete)	Nuttall

Upping North London line capacity

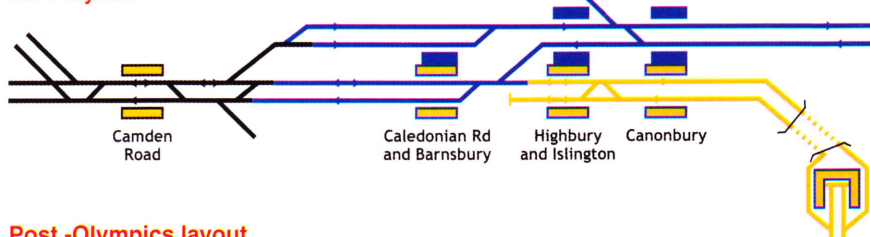
December 2007	Increase in evening services
April 2008	Six trains per hour in the peak
2009	Introduction of Class 378s
2010	Class 378s go from three to four-cars
May 2011	West London services (2 tph) extended to Stratford and additional peak services between Stratford and Camden Road, providing 8tph at the eastern end of the North London line

North London line capacity expansion

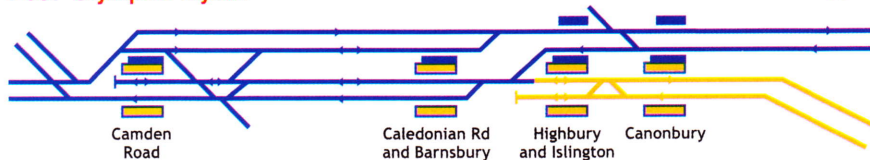
Existing situation



2011 layout



Post-Olympics layout



May 2011: intended frequencies, North and West London lines

Richmond – Stratford	4tph
Camden Road – Stratford	2tph*
Clapham Junction – Stratford	2tph
Clapham Junction – Willesden	2tph

* Peak only.

come under the control of Upminster IECC. The Gospel Oak to Barking line is expected to come into Upminster IECC in the middle of the next decade.

After the Olympics in 2012, the plan is to come back to the North London line in 2013/14 and complete four-tracking through Camden Road station, a project which has been sanctioned by the Department for Transport. This will give further additional capacity for freight.

West London improvements

The station at Imperial Wharf opened on 29 September this year (p9, last month), following on from the new station adjacent to the retail centre at Shepherd's Bush that opened exactly a year earlier.

By the fourth day, Imperial Wharf was attracting over 1,000 passengers in the peak – with virtually no advertising and in the centre of an area where redevelopment is still going on. The buoyancy on this side of the capital means the West London line is the fastest growing segment of the London Overground network.

London Rail's aspiration is to double the frequency on the route from two to four trains an hour, and use the extra capacity being installed on the North London line to extend two of the four trains each hour to Stratford. The West London line is bi-directionally signalled and has capacity in the central section for the extra trains: the problems with accommodating more trains on the line are at the current termini at Willesden Junction and Clapham Junction.

At the northern end, services currently terminate at Willesden Junction High Level, where they have to run on to Kensal Rise to reverse. The plan here is to insert a pocket siding in between the two lines east of the High Level station, to facilitate reversing moves.

At the southern end of the route, Clapham Junction, not only does space have to be found for a doubling of the service on the West London line in May 2011, there will also be four trains an hour off East London line Phase II to accommodate in 2012.

Providing extra capacity is not as simple as it might seem. West London services currently terminate at platform 2, one half of an island platform on the north side of the station. East London services are also expected to come into this part of the station, reaching it via the Ludgate lines and Longhedge Junction, diving under the South Western main line.

Reinstating the disused platform 1, where the old trackbed is cantilevered out over the 'banana arches' under the station, seems an obvious way to provide more capacity. But not only is the integrity of the cantilever structure questionable, the access to platform

1 is obstructed by a building housing signalling equipment essential for Waterloo services. Moving this equipment would not only be expensive, it would also require a blockade that would be difficult to organise in the timescale envisaged by London Rail.

For this reason, London Rail is currently considering a 'Cambridge solution' for Clapham Junction, with West and East London services using just one long platform face at platform 2, with the rear half of the platform reached via a siding in between the present platforms 2 and 3.

Also required will be redoubling of the Latchmere curve, joining platform 2 to the West London line. To facilitate tendering, this is expected to form part of the package of infrastructure works for the East London line Phase II project.

Class 378s arriving en masse

Bombardier is building a new fleet of Class 378 EMUs at its Derby plant to serve the London Overground network. As we have reported, this construction project has run late, but the '378s' are now appearing in force. By mid October, there were eight in service on the North and West London lines, with two units spare. Three DC-only units had been delivered via the Southern to Silwood depot for early trials on the East London line.

When Phase II of the East London line was authorised earlier this year, another three trains were added to the order. Eventually the fleet will comprise 57x4-car units: 34x4-car dual-voltage units for the West and North London and Watford 'DC' routes maintained at Willesden, and 23x4-car units for the East London line maintained at Silwood.

The East London and 'DC' routes will be third rail only. The North and West London lines will be predominantly 25kV AC overhead, with the sections south west of Acton Town on the North London line, and south of the Westway bridge on the West London line, operating on third rail.

Gospel Oak – Barking

Signalling enhancements on the Gospel Oak to Barking line were completed on 14 November 2009, equipping the route with extra capacity to allow it to act as a diversionary route for freight when the main North London line is blocked next year.

The Gospel Oak – Barking service currently comprises two trains per hour in each direction. It was planned to double that frequency in the December timetable this year, but this has been put off till May next year for two reasons. First, the freight diversions from the North London line in next spring's blockade will require considerable line capacity. Second, the new diesel trains being built for the route are running late in construction.

The transformation on this north London bywater next summer will be dramatic, with eight new Class 172 DMUs and a doubling in frequency. The trains will be the same length as today – just two cars – but they could easily be lengthened should future demand justify so doing. The problem is that platforms at South Tottenham station, hemmed in at both ends, would be difficult to lengthen.

London Rail remains keen on electrifying this route. There is a stand-off with the DfT on this, over who should pay for a GRIP 3 study of the project to see if it stands up financially. Transport for London has offered to pay £200,000 – approximately half the cost. **MR**

The 14.08 London Overground service from Willesden Junction arrives at Clapham Junction platform 2 on 28 September 2009.

Brian Morrison



Improvements every year

East London Line Phase 1, Gospel Oak – Barking frequency enhancement	May 2010
East London line northern extension, North & West London line frequency enhancement	Jan/May 2011
East London Line Phase II	May 2012