

# **MEETING REPORTS**

## **THE EAST LONDON LINE EXTENSION**

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**A report of the LURS meeting at All Souls Club House on 13  
January 2009**

Members would be familiar with LU's East London Line, which closed for reconstruction in December 2007. Current works will extend this line northward from just before the closed Shoreditch station to Dalston Junction, and also link in with Network Rail at New Cross Gate to allow southward projection of services. Phase 1a will then see some trains extended alongside the North London Railway to reach Highbury & Islington. Finally, phase 2 promises a branch at Silwood Junction, south of Surrey Quays, to link with the South London Line, enabling trains to be projected to Clapham Junction platform 1. From there the West London Line provides a link to Willesden Junction on the North London Railway, effectively providing a low budget outer-London orbital route operated in sections by Overground to avoid any disruption spreading throughout the network. South of New Cross Gate trains will reach alternately Crystal Palace and West Croydon.

The planned train services will provide four trains each hour on all branches through to Dalston Junction, with those from New Cross Gate projected on to Highbury & Islington in Spring 2011, giving eight trains an hour. There will therefore be twelve trains an hour between Surrey Quays and Dalston Junction from May 2010 until stage two is completed to Clapham Junction, when it will become sixteen trains an hour. Apart from Dalston Junction's four platforms, all other stations will have only two platform faces.

The route has a long history, the Thames Tunnel being constructed from 1825 although not opened until 1843. Intended as a road tunnel, no money was available for approach ramps so it was used by pedestrians and became mainly a tourist attraction. In 1865 the North London Railway opened their line between Dalston Junction and Broad Street, alongside Liverpool Street station. The East London Railway modified the Thames Tunnel for steam train operation and commenced passenger services from New Cross to Wapping in 1869, reaching Shoreditch in 1876. The Broad Street line eventually closed in 1986, and in 1996 LU obtained the Northern Extension TWA Order allowing them to link the East London Line through to this viaduct to extend their trains to Dalston Junction. In 2001 a Southern Extension TWA Order was obtained to effectively incorporate the branch into the national rail network.

The new rolling stock contract was awarded to Bombardier in 2006 to include 24x3-car dual voltage sets due soon for the North London Railway [DM-T-DM], to be followed by 20x4-car DC-only sets for the East London Railway (with AC provision) [DM-M-T-DM]. They are derived from the Electrostar class 377 design but, with longitudinal seating and wide inter-car gangways, crush loading is put at 600 persons. Consideration was recently given to the future possibility of 5-car or 6-car trains but problems exist at several points on the route, including the Dalston Junction bay platforms, and station sites at Canada Water and Rotherhithe. LU carried light loadings on this branch except at Whitechapel and Canada Water during

peak periods. Views were shown of the first trains under construction and out on test runs.

A tour of the route started at Dalston Junction, where two bay platforms for terminating trains will be situated between the through platform faces, which come together as an island platform at the north end of the site where the stair and lift access is situated. Provision exists for a single line curve to be reinstated from the southbound through platform to the North London Line for Stratford should this be funded at some future time. Provision is also made for construction of the Chelsea-Hackney line (or Crossrail 2) beneath this site by the positioning of piles for the planned over-station development clear of the safeguarded route. The line south from Dalston Junction will be roofed to Forest Road, the first overbridge.

The 1865 brick-arched Kingsland viaduct continues south with steel or iron bridges at road crossings, which have been renovated or replaced. The line was originally built for three tracks, later widened to four by constructing to the west a parallel viaduct abutting the original but with no connecting support. The line is being reinstated for only two tracks. Of the 171 brick arches, 168 were retained, being refurbished as required by repointing, grouting, pinning and/or stitching. The poorest three were at the site of Haggerston, the next station south, where cracks around the barrel and to the face at the crown could be seen. These arches were demolished and replaced with a concrete structure, allowing more space for the new station entry area. The new platforms are constructed outside the two-track viaduct.

The original Regents Canal bridge was a two-span construction with cast iron columns on the tow path, beneath which LEB electricity cables have recently been buried. The bridge decking rotted away over time, and it was decided to construct a new one-span bow-string arch bridge here.

At Hoxton the original viaduct arches were in suitable condition for retention and adaptation for use as entry points to the new station platforms, which again flank the viaduct. A sub-station will be located here. Further south, at Kingsland Road, the LCC constructed a large skew steel bridge with two parallel spans about a century ago in connection with tramway electrification. This is to be refurbished with a new concrete trough carrying one track on each span, rather than the original two.

A tight 180-metre radius curve on the new Holywell viaduct, named after a former priory, will take trains from the old Kingsland viaduct to the new Shoreditch High Street tied-arch bridge, narrowly missing a listed building. The bridge was assembled on the old goods yard site, and lifted complete into location over a weekend possession last March. It connects with the new Bishopsgate viaduct which will accommodate a new station, and link with a new bridge GE19 over the Great Eastern main lines to reach the original East London Line route just south of the old Shoreditch station.

The old Bishopsgate Goods Yard was built on two levels, with wagon lifts allowing vehicles to reach the lower level. Archaeological investigations had to be dug before piling for the viaduct support columns could be undertaken. The new viaduct here is completely enclosed to protect it from later construction work to provide a multi-storey development over the whole area. A suggested link with a new Central Line station here would be expensive, given the height difference between the lines, and is considered too close to the current Liverpool Street platform and sidings.

The Holywell viaduct consists of reinforced concrete edge beams, carried by columns on piled foundations, supporting a slab carrying the two tracks with noise

barriers and cress walkways. The Bishopsgate viaduct is similar, but with precast frames and cladding enclosing the train deck and an insitu cast crash deck. This is enlarged at the Shoreditch High Street station site to enclose the platforms, with provision for up to 8-car trains in the long-term. This area will be mechanically ventilated and comply with all regulations for sub-surface stations, although it is not so classified.

Bridge GE19 crosses six tracks into Liverpool Street station, all with overhead electrification. In December 2007 the original structure was demolished to schedule, although the possession overran for lack of Network Rail staff to reinstate the overhead lines. The new bridge is an 84-metre span Warren truss design, built with a 1 in 29 slope as the line descends from the new viaduct to the original cutting. This bridge was constructed south of the main line and launched forward, all 1,600 tonnes, during a possession in May 2008. After successfully positioning the bridge, the launching nose was removed. It was only later, due to an oversight, that the bridge dropped slightly, allowing debris onto the mainline and disrupting services.

The Shoreditch cutting has been filled from the original station building, to form part of the 1 in 29 decline from the bridge. This is being covered with a concrete slab, which will extend throughout the old LU tunnels to carry the new Sonnevile block track which is set up and then concreted in place.

At Whitechapel precautions are being taken in case of settlement from construction of Crossrail under the site in the next few years. It will pass under the north end of the platforms, where escalator and lift access will be provided down to the new line and up to the District Line platforms. The main Crossrail entry will be in Cambridge Heath Road.

At Shadwell the original platform access routes are being reinstated as emergency exits. Beneath the Eastern Basin of the London Dock the tunnel is constructed in the same form as the original Thames Tunnel, with linked adjacent single track roads.

At Wapping, secondary means of escape are to be constructed in access shafts sunk outside the brick retaining walls. The original Brunel staircase will remain at the main entrance, although the lift will be replaced. In the Thames Tunnel very little work is required, major refurbishment having been completed by LU not long ago which obscured most of the construction with shotcrete render. Because of restricted space within the tunnel, any train evacuation will be via the front cab door and down to the track.

At Rotherhithe emergency exits are also to be constructed, this time within the retaining walls. At Surrey Quays new stairs at the north end of the platforms will allow escape to street level. The riveted girders and deck of the Surrey Canal Road bridge have been replaced with a welded girder structure to meet increased weight load standards.

The new rolling stock will be stabled and serviced at a new depot just north of New Cross Gate. The maintenance facility building, west of Canal Junction, will have four roads, one of which will be equipped to jack a whole train. The new northbound link from Network Rail will join the existing line alongside this building. The bulk power supply and traction sub-station will be located immediately to the east of Canal Junction. The train crew centre, signalling and control centre will be a multi-storey building to the west of the line.

All trains for the line will be stabled between the new northbound and the existing line. Servicing will be undertaken overnight, and lighting is designed to be

unobtrusive to neighbouring properties. It is intended to wash all trains every other day, either before or after their daily duties, using recycled wash water and harvested rainwater from the site. A wheel lathe is provided in the heavy clean building, where jet washing is done. A 25kV pantograph test facility is provided, since dual voltage North London line units will also be serviced here.

The New Cross Gate flyover allows Network Rail northbound trains to cross the main four-track line to reach the East London line. It has a 75-metre Warren truss span, with a further 31-metre span over the depot access track. The bridge was assembled alongside the site and, during a possession, was rolled to its final location on multi-tired vehicles and lowered onto its abutments. The southbound route will continue through platform 1, linking with the down slow track beyond the first overbridge, allowing trains to reach Crystal Palace or West Croydon.

In phase 1a of the extensions, the Dalston western curve is to be reinstated to allow trains to reach Highbury & Islington via Dalston Western Junction. This is mainly a covered way with buildings above, but the original cast iron girders will need to be replaced and therefore the buildings must be removed. The route under Kingsland High Street was renewed for tramway electrification, but not the sections under walkways and buildings, so this will all be renewed. The original three-track covered way is the route to be renewed. The parallel single-track route constructed later is in poorer condition and will be refilled.

Phase 2 to Clapham Junction will later reinstate a section of line linking from Surrey Quays to Old Kent Road Junction, closed around 1910 although still in railway ownership. The Silwood Triangle area, where this route diverges from the existing East London line, has been used as a contractors work site, and is equipped with temporary sidings for loading of works trains used in the tunnel section. After works on phase 1 were started, it was decided to make provision for Silwood Junction required by phase 2, and the northbound line is now to be diverted slightly west of its original alignment to cross a bridge over the route for the future Clapham Junction trains before joining what will become the northbound route from that branch.

Subsequent to this presentation, it was announced that phase 2 is also to be funded, for completion before the London Olympics.

**John Hawkins**