

# **MEETING REPORTS**

## **CROSSRAIL – WHERE ARE WE NOW?**

**by David Anderson, Engineering Director, Crossrail**

**A report of the LURS meeting at All Souls Club House on 10  
February 2009**

Our speaker had worked on the Crossrail project for over six years, but the current scheme was first proposed back in 1989 by the Central London Rail Study. Although it failed to receive Parliamentary approval in 1994, the route remains safeguarded. The Strategic Rail Authority reconfirmed this route in its East-West study, and in 2001 formed Cross London Rail Links with LU to progress the proposal. A business case was completed by 2003, showing a very strong 3 to 1 cost/benefit analysis, and the Parliamentary Bill was prepared.

Crossrail became a key element in the Mayor's London Plan due to expected population and employment growth, providing a direct link between Canary Wharf, the City, West End and Heathrow. This will aid retention of World City status and therefore support growing GDP and tax revenues, to the benefit of the Nation. It will add 10% to network capacity, providing congestion relief over a wide area and improving service quality.

The Parliamentary Bill was deposited in 2005, and some 400 objections were received, compared with 1,000 received by the Channel Tunnel Rail Link. Select committees considered these in detail in the Commons and later in the Lords, during which time some mitigation was offered, and the Royal Assent was finally given in July 2008. The Bill, now the Act, defines limits of deviation, provides for compulsory acquisitions, etc. Some details still need to be determined with the local authorities.

The approved route is 90km from Shenfield to Maidenhead, with branches to Abbey Wood and Heathrow, although the route is safeguarded beyond Maidenhead and Abbey Wood. The Heathrow branch is the current route, with works confined to the flyover junction; the current Heathrow Connect service will be replaced whilst Heathrow Express continues. Crossrail trains will call at all stations, except to the west. The peak service pattern will be 24 trains hourly, half from each eastern branch, bound for either Heathrow, Maidenhead, West Drayton or Paddington. There are 28 surface stations, 11 of which will be substantially rebuilt. More than 80% of the project costs are for the 21km of central area tunnels, with sub-surface stations and shafts for ventilation, intervention or escape.

A £15.9 billion funding package for the project was agreed at the end of 2007, with agreements entered into by the end of 2008. The financial crisis has had no effect on the project to date, with published speculation being both positive and negative. Work is now under way to acquire sites and clear them for construction works. Scheme design work is now becoming more detailed, and the procurement process is under way. Enabling works will begin later this year, with the main construction commencing in 2010 and the launch of the first tunnel boring machine in 2011. Proposals for systems, signalling, communications and rolling stock are being developed for procurement. Later there will be testing, commissioning and finally opening of the line by the end of 2017.

Cross London Rail Links will deliver the central area tunnelling works, including railway and stations. However, 'on Network' works are with Network Rail whilst LU is

providing the stations at Bond Street and Tottenham Court Road in connection with congestion relief works at their adjacent stations. At Farringdon an integrated ticket hall is being developed with Thameslink through Network Rail, and the Canary Wharf Group are providing the Isle of Dogs station in conjunction with a new commercial development. At Woolwich the station box is to be constructed by Berkeley Homes in connection with their housing development. All these delivery agents are to be co-ordinated by Crossrail. There will also be interface with DLR at Custom House and alongside the Great Eastern line. It will also be necessary to work with the utility companies, regulatory authorities and the Olympic Delivery Authority. Many stations will have commercial developments above, which still require local government approval.

Design vision principals include a modern railway to support London, suit passengers and integrate with the Network. Design values include simple, easy to use, sustainability in all aspects, maintainable, inclusive and accessible, easily operable, value for money, and to always maintain the business case.

The main tunnel drives will be east from Royal Oak and west from the Limmo Peninsular, by Custom House, under the Thames. These drives will meet in a deep pit at Farringdon, where London clay is not available for easy tunnelling. A short drive will run east from Stepney Green junction to the Pudding Mill Lane tunnel portals. Another drive will take the line under the river to Woolwich. The tunnels will have a 6-metre diameter to accommodate suburban trains with overhead electrification, and provide side walkways. This is smaller than the recent Channel Tunnel Rail Link tunnels, but will produce 7.3 million cubic metres of spoil to be disposed principally from Westbourne Park by rail and from Limmo Peninsular by barge. It is hoped to find reuse possibilities, rather than using landfill sites.

A generic layout for a central area station showed 240-metre platforms, half as long again as at tube stations, although the initial service was expected to use 200-metre 10-car trains. Most such stations will be double-ended, with a depth of 25- to 30-metres. They will generally feature subterranean concourses, linked by escalators and lifts to the ticket hall above, and to a central area between the platforms below. Some will be built from the surface, whilst others will break out from the running tunnels below.

A tour of the line started at Paddington, built in a shallow box beneath Eastbourne Terrace, with links to the Hammersmith line at the north end, and to the other tube lines at the south end. At Bond Street the west end of the platforms link to the LU station and a new Davies Street development, whilst the smaller east end is in Hanover Square, not far from Oxford Circus. The busiest station is expected to be Tottenham Court Road with a western ticket hall at Dean Street, and linking at the east end with the new LU station beneath a new Astoria development. Farringdon station will be adjacent to Smithfield Market, with a new western ticket hall to be shared with Thameslink, and a smaller eastern ticket hall in Linnsey Street linked to Barbican station. Liverpool Street station will have a western ticket hall in the Moorhouse development, built with a ventilation shaft for Crossrail some years back. There will be a connection with the LU station there, and also with the main Liverpool Street ticket hall at the eastern end, where a new ticket hall will also be built in the Broadgate development. At Canary Wharf, the Isle of Dogs station will be built to the north of the current cluster of buildings, in the north dock, with a commercial development above. Interchange with nearby stations will be by surface connections. To the east, the old Connaught tunnel, recently abandoned by the

North London Line beneath the Royal Docks, needs to be refurbished for double-track use again.

Detailed planning of all aspects is now under way, including logistics for delivery of materials and removal of spoil, the precise number of shafts required, the number of tunnelling machines, etc. Around 1,400 people will be required for these works, and a skills and resources academy is to be developed. Rolling stock will be stabled throughout the route, and this has still to be finalised. However, servicing and major maintenance will be undertaken within existing rail works sites at Old Oak Common and North Pole.

**John Hawkins**