

BANK STATION CAPACITY UPGRADE PROJECT

by Simon Addyman, Programme Manager

**A report of the LURS meeting at All Souls Club House
on Tuesday 8 October 2013**

Bank station already operates at near capacity. Whilst inward and outward passenger numbers there increased by 25-30% from 2003 to 2010, interchange traffic increased by over 40%. It is mainly an interchange problem that needs to be rectified. The Northern Line platforms also provide an interchange route and when it becomes necessary to non-stop trains to relieve congestion, adjoining stations immediately become overcrowded themselves and also at risk of closing. Service disruption incidents at Bank more than doubled between 2010 and 2011.

The upgrade project has been under-way for some ten years now, looking for congestion relief, step-free access, and compliance with fire and evacuation requirements. There will be savings in journey times and improvements in ambience. Around 140 options were considered before the base case was defined. These included avoiding the need for diversion of a running line by widening the current platforms through pushing out the walls in some way, but this was found to be impracticable.

The Bank site is a difficult one. Of the 67 buildings in the affected area, 38 are heritage listed including the Mansion House and St. Mary Abchurch (designed by Wren, of brick construction on an 800 year-old foundation). 80% of affected buildings are in a conservation area. A public consultation exhibition opened in the church on the day of this meeting as part of preparation to submit an application for a Transport & Works Act order.

The original project baseline solution had a 60 year business life. There were journey time benefits of £774m and a benefit to cost ratio of 2.4:1. But there were operational hotspots with complex construction, a constrained work site and a complex power solution. It was sub-optimal and would have been over time and budget. In a new approach, the scheme design was put out for procurement under an Innovative Contractor Engagement which supplied pre-qualified innovators with all work to date as background information, but required them only to meet the project objectives within the budget and timeline. Discussions with each contractor were held in confidence, but upon contract award to Dragados the innovative ideas of unsuccessful bidders were rewarded and shared with the successful party.

The Dragados design was the only one to cut the envisaged five month interruption to services on the Northern Line. It was also outstanding for the capacity enhancement and reduced journey times offered. Other improvements in design and construction and in step free access were obtained from unsuccessful tenderers. The benefit to cost ratio has been improved by 45% to 3.5:1, whilst the journey time benefit is up by 19%. At the same time the budget has been cut by over £60m, or nearly 10% and revenue increased by over £30m or 15%.

The selected scheme will block Arthur Street and sink a shaft into the old King William Street station tunnel, the City terminus of the first tube railway, which will become a work site and base for tunnelling. *[The sharply curved tunnels under Arthur Street were avoided by the extension to Moorgate in 1900].* Arthur Street was closed during the Olympics and is not in the conservation zone so this innovation is expected to be approved. Five or six trucks could be parked along the street awaiting spoil loading for use as landfill, probably on the Thames Marshes.

The plan is now to use the whole of the 10 King William Street block as a construction site, but to retain 20 Abchurch Lane as site offices which will save money. Triple escalators are to be provided at all four locations, including to the new ticket hall on Cannon Street which originally was only to have lift access to King William Street. The current southbound Northern Line platform is to become a concourse, with a new platform constructed further west because of the wrong-road running in this area. A 94m bi-directional moving walkway will be provided in the Central Line interchange passage which will cut journey times. The current disabled access lift will be retained whilst three new lifts are provided direct to the Northern Line and DLR, an improvement on the base scheme. The Northern Line blockade will be shortened by five weeks, and there is a simple power relocation scheme.

The tier two sub-contractors are now being contracted and co-located so that safety can be designed into the construction and later maintenance stages of the project. This is another innovation since they are usually not involved until designs are near finalised.

The critical path programme showed that on-site works cannot commence until mid-2016 whilst design work progresses to enable the Transport & Works Act application to be made and heard. At the same time works on utilities diversion and settlement mitigation can be undertaken. Once the Order is achieved, the Arthur Street shaft will be sunk and tunnelling commenced from the south of the site progressively towards the north, first with the new running tunnel and enlarging the new platform tunnel. Tunnelling will continue with the moving walkway passage and on to the Central Line escalator shaft. The high voltage switch room will then be fitted out and the moving walkways installed. Less critical will be demolition of existing buildings for the station box excavation, the new ticket hall and the escalators at the south end of the site. In mid-2020 there will be a closure of the Northern Line for some four months whilst the new connections are made and all work at deep level is completed. On reopening in autumn 2020 all the new interchange facilities will be available and only the new ticket hall will need to be completed for opening by mid-2021.

Answers were provided to a wide range of questions from the audience. Work on handling the line blockade is at an early stage, but it is intended to co-ordinate closures with other Northern Line works including any for the Battersea Extension. It is hoped to operate a curtailed service to Moorgate and run additional trains through the Charing Cross branch during line closure. The closeness of the current running tunnels prevents train operation whilst connections with the diversion tunnel are constructed. The inevitable inconvenience will have to be managed as best as possible. The connection between Kennington and Moorgate will need to be covered by additional bus services.

In response to a suggestion that Crossrail will have a major impact on central London overcrowding, our speaker pointed out that projected demand took account of all planned transport developments. The effect of Crossrail will be noticeable in the short term, but demand is expected to continue to build.

The planned escalators will be of a new standard LU design which should cut costs and improve reliability. Space for triple banks of escalators, where only two had been thought possible before, results from new tunnelling techniques that have been learnt from the Jubilee Line Extension and now on the Crossrail project. All tunnelling in the area is within London clay. The biggest flood risk within the project will be from the historic under-river tube tunnels into the former King William Street terminus, and this has to be mitigated.

Our speaker was thanked for his comprehensive presentation in the usual way.

John Hawkins

The following notes complement the meeting review, above.

THE BANK STATION CAPACITY UPGRADE CONSULTATION EVENT

by Antony Badsey-Ellis

As part of the public consultation for the Bank Station Capacity Upgrade scheme, an exhibition was held at St. Mary Abchurch (adjacent to the proposed new Cannon Street ticket hall) between 4 and 8 October 2013. A number of display panels were placed in the church, as well as a large, colourful 3D model of the station and proposed new underground structures. This was apparently produced using 3D printing technology. A smaller and plainer model of the new Walbrook entrance currently under construction was also on show, although this does not form part of the consultation. There were several staff from the project team on hand to explain details of the project and answer questions. The following notes cover areas not discussed in the talk to LURS on 8 October 2013.

The construction site in Arthur Street allows stacking of lorries and avoids the need for a lorry to service the Cannon Street site every 2½-3 minutes, which would rapidly lead to gridlock in the City. However, Arthur Street is the designated route for fire appliances from Dowgate Fire Station to Bank station, and hence discussions about alternative routings are being held.

The shaft in Arthur Street will be sunk into the platform area of King William Street station. There was no awareness of any requirement to protect any heritage in the station.

Planning work with LU operations is determining the best way to manage the 2020 blockade. It is currently envisaged that this will be for 17 weeks on the southbound line, and 5-6 weeks on the northbound, with these trains not stopping at Bank for the remainder of the 17-week southbound

closure. Unfortunately, the locations where the new running tunnel connects with the old do not permit the construction of step-plate junctions, which could have been built around the running tunnels with shorter closures. The southern connection is close to the river and possibly in ground disturbed by the piles of the original London Bridge; this is the same situation encountered when the new southbound Northern Line platform was constructed at London Bridge station. To the north, the junction will be beneath the junction of Lothbury, Princes Street, and Moorgate. At this point the Northern Line running tunnels are one above the other as they curve north into Moorgate, and there is insufficient room to build a step-plate tunnel.

By 2020 Crossrail should have eased congestion at Moorgate station. There are still concerns about whether sufficient Northern Line trains can be reversed to allow a service to operate to the northern branches of the line during the blockade. The crossover is of the trailing type; more trains could be reversed if this was to be replaced by a scissors crossover, but installation of this would mean many weekend closures prior to the blockade, and would be complex because of the disused floodgate at the station. There would be no need for a scissors crossover after the blockade, and hence the cost and disruption of installing one would have to be weighed against the benefit of its presence for just 17 weeks.

South of Bank, there are no crossovers north of Kennington. Consideration has been given to single-line working from London Bridge southwards, but the heavy traffic at this station is likely to make this not feasible.

Although a triple bank of escalators will be created linking the Central Line platform level down to the new moving walkways, it is expected that this can be achieved without closure of the Central Line or its platforms. Some propping might be required though.

No decision has yet been taken as to whether the existing tiling and design theme used at Bank will be extended to the new areas, or if the Northern Line would gain a new look.