THAMES TUNNEL
–INITIATING THE DELIVERY OF THE UK’S LARGEST
PRIVately FINANCED PROJECT

Report of seminar 167 held on 23rd February 2012
at Savoy Place, London

SUMMARY
KEY CONCLUSIONS

• Although the current Victorian sewerage system was built at a time when London’s population was 2.4 million, it was designed to serve 4 million. Nowadays rainfall causes the system to overflow and discharge into the River Thames and the tidal effect retains the outflow for longer.

• A large number of sites are required for construction activity and it was important to adopt an agreed methodology to select sites. Also design was progressed as a parallel process. This allowed the assessment and adoption of a modified route and optimised solution.

• Although the Department for Environment, Food and Rural Affairs’ (Defra’s) interest is driven by health issues for the general public, it is difficult to monetise the ecology, ecosystems and visual appearance. The economic base case reflects high benefits with large variations and uncertainties in some benefits. There is though a high level of scrutiny.

• In a large project of this nature there are difficulties in balancing each component case. Therefore, you cannot make presumptions about issues like speed of decision making or other aspects of the numerous components.

• Being one of the top 40 government-supported projects provides greater support and progress, but this has to be balanced against the huge value of the project and the promoter’s balance sheet. The ‘in principle’ support of the Government (if needed) makes the project affordable.

• Discounted cash flow assessments for business cases provide a perspective from today, whereas the benefits invested for our grandchildren might provide a better viewpoint for long-term projects.

• Problems should be ‘back solved’ from a long-term end-game position, recognising that solutions become confined by developing constraints.

• Ofwat recognised that this project is 100 times larger than usual capital works in this industry and covers more than one price-setting period. A staged approach to funding was approved going forward. Finance on this scale is a key driver of value for money for the investor.

• Public consultation included a specially designed envelope to encourage the posted notices to be opened, and every request for a meeting was granted.

• The requirement of the new planning regime necessitated the identification of all potential land affected, and the need to maintain the database over time has added to costs, with lack of flexibility once the application has been lodged.

• Key lessons so far in the design stage are the early appointment of a world class project manager capability, provision of clarity on how it will be done and an open dialogue with all stakeholders.

These are the views of Malcolm Noyce, Executive Director, MPA
London’s 150-year-old sewers designed by Sir Joseph Bazalgette are an astounding example of Victorian engineering, and still serve the capital today. However, the sewage network, which collects both foul waste and rainwater, is overloaded, resulting in an average of 39 million tonnes of raw sewage overflowing into the River Thames every year.

The solution is the London Tideway Improvements project, which includes improvements to various existing treatments works together with the construction of the 7km, £635 million Lee Tunnel. Work on these schemes is already underway.

Chaired by Norman Haste OBE, this seminar looked at the third, and most complex element of the solution, the Thames Tunnel – the UK’s largest privately financed infrastructure project. It has been under development for the last 10 years, and is now close to getting a planning decision for implementation.

Delegates heard from speakers who have been involved with the project from its inception through to the planning and delivery processes.

The first presentation, from the Head of London Tideway Tunnels at Thames Water, put the Thames Tunnel project into context by looking at the history and current challenges of London’s existing sewerage system. It was explained how the dire state of the River Thames provided the catalyst for Sir Joseph Bazalgette’s mid-19th century sewers – which are still in excellent condition today, but lack the capacity for modern day London.

This undercapacity in the Victorian system means there is a potential hazard to all river users from frequent sewage discharges into the Thames – as little as 2mm of rain can now trigger a discharge from combined sewer overflows (CSOs), whilst tides mean that the sewage stays in the river for weeks, affecting dissolved oxygen levels and habitats. Legally, the UK fails to comply with the EU Urban Waste Water Treatment Directive.

The presentation outlined the possible solutions that have been considered over the last decade. The Thames Tideway Strategic Group worked between 2000 and 2006 to define the scale of the problem, and evaluated the various options. In conjunction with the upgrading of London’s five tidal sewage works and construction of the Lee Tunnel, the Thames Tunnel is considered to be the most cost-effective way of tackling the problem.

The development of the optimum design to meet the scheme’s objectives was summarised, looking at the options for the tunnel’s route from Hammersmith in West London through to Beckton sewage treatment works in the east.
The second presentation, from Defra, considered the main policy and regulatory drivers in the waste water sector – public health, the environment, appearances and the economy – and the difficulties of monetising their impact. Money spent on maintaining waste water standards is usually money well spent, but it can be difficult to demonstrate a clear cost/benefit ratio.

For instance, public health was historically the key underlying driver, with a series of public health acts dating back to the 19th century. However, it is not easy to monetise the benefits of an efficient sewerage system for public health reasons: the figures for public health incidents arising from sewage are quite low, but if a similar calculation had been done following the cholera epidemic of 1858, the figures and thus the resulting monetary benefit value of intervention would have been much higher.

Equally, it is difficult to monetise either the long-term economic or the environmental impact. For example, whilst the environment is becoming more important as wider benefits to society and the economy are recognised, monetising the long-term benefits is not straightforward.

The presentation went on to look at the main legal drivers, and the key regulatory agencies involved in the Thames Tunnel project. For example, Defra sets the policy framework and is responsible for ensuring that the overarching framework is fit for purpose. Ofwat is the economic regulator: one of its duties is to ensure that an efficiently run water and sewage company can finance itself to deliver compliance with the law. The Environment Agency enforces environmental law.

It was explained that the waste water sector is highly regulated, and for good reasons. For example, the impacts of sewage and its treatment are usually felt many miles from where it is first produced: the people most affected would not be the ones who caused the pollution.

The Thames Tunnel presents unique challenges in project development and finance. This presentation explained that as project sponsor, Thames Water must address the interests and concerns of its customers, shareholders, Ofwat, central and local government, the wider community of London and many other stakeholders, including the financiers and the contractors.

As sponsor, Thames Water will provide effective and efficient sewerage and drainage services to London, while meeting environmental law with respect to the CSO discharges into the River Thames.

In meeting its obligations Thames Water has to make proposals to fulfil the requirements of regulators and the law. These proposals must be implemented cost-effectively, ensuring they are financed appropriately, have the necessary consents, and that customers and other people affected are kept appropriately informed.
The presentation went on to look the role of the programme manager CH2M HILL, the business case for the tunnel, and the preferred commercial delivery route. For example, as far as the business case is concerned, it was explained that the tunnel is an essential piece of infrastructure needed to sustain London as a successful city, future-proofing the network for the next 120 years. In employment terms, over 4,000 jobs will be created directly and a further 5,000-plus jobs indirectly over a period of up to seven years.

In terms of delivery, the project requires the formation of a project-specific vehicle as the infrastructure provider (IP) under the Flood and Water Management Act 2010. The IP is established within the regulatory framework of the water industry, and involves for instance the use of measures to achieve the required levels of cost and risk control, and incentives.

The key features of a regulated utility model for the preferred delivery route were outlined – for example, as a private sector solution, the project has access to capital markets as well as banking markets, and a remote call on government backstop if necessary.

The presentation also looked at the proposed contractual structure, and at the different roles Thames Water will undertake during the development, construction and operational phases of project implementation. It concluded with a résumé of key project development issues.

**HOW WILL THE REGULATOR ENSURE THE CUSTOMER GETS VALUE FOR MONEY?**

This presentation looked at the Thames Tunnel project from the perspective of Ofwat, the organisation established in 1989 as the independent economic regulator of the water and sewerage industry for England and Wales.

It outlined Ofwat’s duties as the regulator, and went on to look at objectives for the project. These include ensuring that Thames Water’s customers achieve best value for money, and that Thames Water and any third party infrastructure providers are accountable to customers. They also include support for the use of new approaches for large projects that deliver better outcomes for customers across England and Wales.

Some of the project characteristics and key regulatory and commercial issues for its funding and implementation were discussed – for example, procurement and construction considerations such as the capability and capacity of the tunnelling market and competitive pricing. It was noted that the project is more technically complex than other tunnelling projects, and financing and mitigating the tunnelling risks are significant considerations for the regulator.

In concluding the presentation it was noted that the Thames Tunnel is a one-off project for Ofwat in terms of scale, financing, regulation and resources within the regulated market. This means that Ofwat has the challenge of resourcing the development of a solution to a project, but without a template.
A project of the scale of the Thames Tunnel raises a number of strategic planning issues, even before the detail of the application is considered. This session from Thames Water looked at site selection, the route to consent, the Planning Act 2008 and the consultation process.

The first thing to be done following the setting up of the project planning team involved consultation with local authorities to agree a methodology to select the 22 construction sites needed to build the tunnel. A shortlist of 1,149 sites was drawn up; after sifting there was a final list of 150 sites for detailed consideration.

It was explained that the route to consent was not straightforward – for instance, the standard planning route would have involved seeking individual approvals from 14 different borough councils. The route chosen was to use the Planning Act 2008 process, which involves a single application for a consent order from the Infrastructure Planning Commission (IPC) for a Nationally Significant Infrastructure Project (NSIP). An initial difficulty was that the Thames Tunnel did not immediately fall into any of the categories in the Act, and an order to amend the types of developments categorised as NSIPs was required.

The implications of changes made to the procedure following the 2010 general election were noted – for example, the new Localism Act 2011 and the abolition of the IPC (which merged into the Planning Inspectorate in April 2012.)

The Planning Act 2008 places emphasis on consultation through the Development Consent Order (DCO) pre-application process. The nature and scale of the detailed phase one and phase two public consultations that have taken place since September 2010 were outlined. Responses to the phase two project-wide and site-specific issues are in the process of being analysed, and a draft scheme will be determined in the light of outcomes to the consultation, in preparation for application towards the end of 2012.

The session concluded by considering some of the drawbacks of the Planning Act process, and lessons learned.

The Head of London Tideway Tunnels at Thames Water gave the final presentation of the day, outlining how the project has progressed over the last year, the technical challenges, and the delivery route strategy.

The proposed 25km long, 7.2 metre diameter Thames Tunnel will broadly follow the route of the river from west to east, up to 67 metres below ground and beneath all other infrastructure. It will capture sewage from the 34 most polluting CSOs and transfer the flow to Beckton sewage treatment works. Using the existing sewerage system to best advantage, the preferred route will run from the Acton storm tanks in the London Borough of Ealing to Abbey Mills Pumping Station in East London, where the Thames Tunnel will connect with the Lee Tunnel.
Some of the considerable technical challenges were discussed – for example constructing the deepest tunnel in London, dealing with vast volumes of sewage falling significant distances, air management, odour control and protecting third party infrastructure. It was explained that the scheme will use a range of creative and innovative solutions to minimise the environmental impact of construction.

The project was named as one of the top 40 priority infrastructure investments in the National Infrastructure Plan 2011. Thames Water is working very closely with Defra, HM Treasury, Infrastructure UK and Ofwat to get the best value for money (VfM) mechanism for delivery, and a final decision on the best VfM approach will be made after further analysis is completed.

The proposed timeline for the programme was outlined: phase two consultation is complete, and the scheme now needs to be finalised, the Environmental Impact Assessment completed and designation as a Nationally Significant Infrastructure Project achieved. The DCO application is due to be submitted towards the end of 2012. If determination of the application is made in 2014, it is expected that the main construction works would start in 2016, for a duration of six to seven years.

CONCLUSION

A cleaner and healthier River Thames is essential for the prosperity and global reputation of London. Currently, untreated sewage from an overstretched sewerage system is polluting the capital’s river; this is not only unsightly but is a potential health risk for river users, damaging to wildlife, and in breach of European legislation.

The Thames Tunnel project is a vital investment to ensure that London has a sewerage system to rely on for the next century and beyond, as well as a clean river running through its heart.
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