## **PLANNING** IN LONDON

THE JOURNAL OF THE LONDON PLANNING & DEVELOPMENT FORUM



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#### Sustainable suburban centres

Dr Nicholas Falk on what can be



### Inclusive design The people-centred approach –

Yanki Lee of the RCA



#### Heathrow - a retirement plan

Sir Peter Hall and Tony Hall



#### From backyard to Gateway Sarah Allan introduces CABE's

guide New Things Happen



### How extreme is Stern?

Dan Lewis on page 19

New for 2007 from Planning in London



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#### What is the London Planning & Development Forum?

Established in 1980 following an allparty inquiry into the development control system, it comprises representatives from:

Association of Consultant Architects

Association of London Borough

**Planning Officers** 

Association of London Government British Property Federation City of London Law Society Confederation for British Industry ODPM English Heritage **Environment Agency** Government Office for London, Greater London Authority House Builders Federation Landscape Architecture SE London Chambers of Commerce & Industry London Forum of Amenity Societies London Housing Federation National Planning Forum Planning Officers' Society RIBA, RICS, RTPI, UDAL Transport for London Affiliated members are: London University (The Bartlett, UCL), Planning Aid for London, Berkeley Group plc, DTZ Peida Consulting

The Forum reports its views directly to its constituent bodies.

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Winner: The Roundhouse by architects John McAslan & partners. All winners pictured



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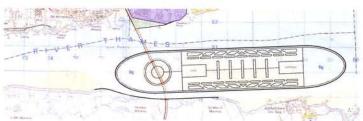
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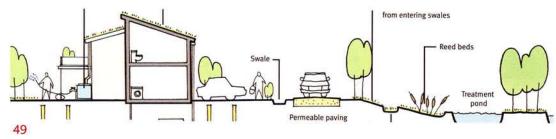
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# Thames Reach Tunnel – an integrated idea for the SE

Mark Willingale outlines a proposal which could provide sustainable capacity for London's future growth in the Thames Gateway region.



Mark Willingale is an architect and development consultant with Bluebase

Money and services, goods and people find their way around the globe to and from London. The strength of the UK economy depends on the strength of London's economy, from the financial services sector to the trading of goods and services, supported by a transport infrastructure that provides frequent connections to a wide range of destinations around the globe, enabling London to maintain its position as a world metropolis.

This position is increasingly threatened by a lack of transport capacity. At the same time, London is facing a housing shortage together with projections for increasing population growth in the early part of this century. For much of the 20th century London's population was static or slowly declining, while other world cities were experiencing the doubling, tripling, or even quadrupling of their populations. London's ageing infrastructure did not have to cope with the stresses encountered elsewhere.

Now London is facing problems that seen in isolation appear exceptional: rapidly rising immigration, unaffordable key-worker homes, and inadequate capacity on the roads, railways and runways. In fact seen together these problems indicate a return to the kind of growth not experienced in London for two generations.

Finally, there is the new threat of global warming with the consequent need to improve London's flood defences, develop sustainable power supplies and reduce carbon emissions. If tackled in isolation, the cost of addressing these questions will be prohibitive with many billions of pounds required for transport improvements, flood defences and sustainable power generation.

#### Thames Reach Tunnel

The intention behind the Thames

Reach Tunnel idea is to provide an integrated solution, combining new transport infrastructure in the Thames Gateway with a surge-tide barrier and tidal power plant. The resulting tunnel-island system provides sustainable capacity for London's future growth in the Thames Gateway region, along with necessary improvements to London's flood defences, at a cost significantly lower than the equivalent provision of disparate solutions.

The tunnel-island system also provides the most economic and sustainable solution for aviation capacity in the South-east, sufficient for growth in the 21st century while replacing inefficient capacity elsewhere.

The integration of a Lower Thames Tunnel with a Surge Tide Barrier and Tidal Power Plant provides the following infrastructure benefits

- New orbital road and rail networks for the Thames Gateway
- Relief of congestion on the M25/ Dartford Crossing
- Extension of Crossrail to form an orbital 'Crossrail Plus'
- A rail-freight bypass east of London
- A rail-freight connection for the East Coast Ports to the Channel Tunnel
- A surge tide barrier for London
- A tidal power plant for the tunnel and orbital rail networks
- Maintenance of the Thames shipping channels
- Contribution to the Government's renewables obligation
- Improvements to the South West Canvey Regeneration Area

The subsequent and independent airport option provides:

- The most sustainable and efficient new aviation capacity for the Southeast
- Minimum seeding costs for a newbuild airport in the South-east
- Minimum environmental impacts

for new aviation capacity

 As stated above, sufficient growth for 21st century while replacing inefficient capacity elsewhere

#### Tunnel-Island construction

Construction would start with the formation of a flood bund to impound over four square kilometres of the Thames between Canvey Island in Essex and the Hoo Peninsula in Kent. A second flood bund built from Canvey Island encloses an area on the north bank for land reclamation. This area first accommodates a casting basin for the concrete sections of the immersed tube tunnel.

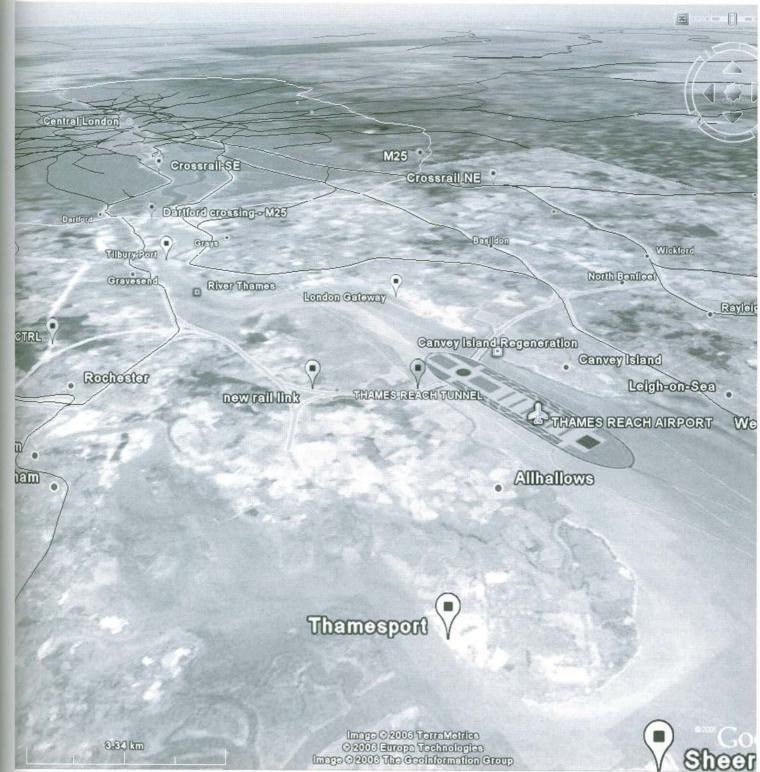
The island and north bank reclamation areas substantially reduce the overall length and cost of the immersed tube tunnel, since the approaches on the north and south sides, the short length from Kent and the stretch across the island can be built using conventional cut-and-cover methods, leaving only one kilometre of immersed tube sections under the main shipping channel.

The area of the north bank reclamation also provides a settlement lagoon for the containment of spoil during the dredging of the tunnel trench across the Thames. A flood bund within the island allows 400m to remain open-cut dividing the tunnel into two separate lengths. Upon completion the island becomes a surge tide barrier and tidal lagoon for power generation.

The lagoon has a tidal range of 5m, sufficient to power the tunnel mechanical and electrical systems leaving a surplus of 15 megawatts for the National Grid or for direct use running the Thames Gateway rail orbitals.

The surge tide island and north bank reclamation areas are configured to lower the tidal range upstream and protect London from flooding. The tidal lagoon can be

Mark Willingale graduated from Cambridge and the Architectural Association and has been in private practice as an architect and development consultant based in Clerkenwell since 1990. With David Cook and Matthias Hamm he formed Bluebase, a design and development consultancy that specialises in interdisciplinary spacial solutions for larger scale projects. The team have an extensive knowledge and experience of development in London and the Thames Gateway region. Bluebase prepared and submitted earlier versions of Thames Reach Tunnel and Airport to the Government's SERAS study in 2003. The present proposals are the result of advances on this work.



flooded during surge tides to reduce peak levels upstream while generating additional tidal power.

The Hoo Marshes and Hole Haven immediately upstream from the island provide additional flood relief capacity in emergencies. The location and configuration of the island and associated flood bunds on the north and south sides of the Thames are optimised to minimise the impact of a surge tide on the Thames into London and maximise the power output of the tidal lagoon.

#### New orbital road and rail routes

New orbital road and rail routes serving the whole Thames Gateway region are created from relatively short new connections to the tunnel; 26km of new twin-tracks connect existing lines from Liverpool Street and Fenchurch Street with those from Victoria, Charing Cross and London Bridge to create 260km of new orbital rail routes around the Thames Gateway. About 16 km of new D2 road links the A130, A127 and A13 in Essex with the A289, A2 and M2 in Kent to create 160 km of new orbital D2 routes around the Thames Gateway.

A Crossrail Plus system connects the proposed east and west branches to form a circle line for the Thames Gateway. These new orbital routes relieve congestion on the inner London arteries and Dartford Crossing, while increasing the capacity throughout the Thames Gateway region. Sufficient power is generated by the tidal lagoon for the rail orbitals to operate carbon free.

#### Rail freight between the East Coast Ports and Channel Tunnel

A 7km link from the CTRL to the Isle of Grain Line completes a freight rail connection between the East Coast Ports (Felixstowe, Harwich International, Tilbury, Thamesport and Sheerness) and the Channel



Tunnel, allowing rail substitution of road freight between Europe and the southeast of England.

Thames Reach Tunnel also provides a rail freight bypass of Central London for freight distribution to and from the East Coast Ports. The north portal emerges close to the new London Gateway Container Port at Shellhaven.

The proposed Bathside Bay container port at Harwich would also benefit from the improved rail access.

#### The subsequent airport option

An extension of the tunnel-island system provides the most economic and sustainable solution for new aviation capacity in the southeast, with the minimum environmental impact. The phased addition of runways and airport facilities creates an airport system with a 1.5km infield and two 4.8km runways that operate for 20/24 hours to provide capacity for up to 100 million passengers per annum on a lower load factor than the current factor for Heathrow.

The CTRL connection provides rail/air substitution for domestic and

European destinations and a fast rail link to Central London. An additional tidal lagoon is provided at the eastern end to raise total output to 37MW, sufficient for the Thames Gateway rail orbitals, tunnel and airport systems to operate carbon-free. The initial D2T2 multi-modal tunnel capacity is sufficient for the first twenty years of operations. Thereafter additional surface access capacity would be provided from airport revenues.

Minimum environmental impact

The location of the airport in the Thames Estuary results in a very low population within the flight-path risk, noise and NOX contours and a very low property impact with minimal land, homes, or buildings taken for the surface access.

The inter-tidal mudflats covered by construction are already subject to rising sea levels. Deep channels around the airport island perimeter and the protected tidal lagoons beyond the ends of the runways minimise bird strike.

Most sustainable and efficient

#### aviation solution

The airport platform is constructed to have low embodied energy. The compact footprint reduces travel times and energy consumption within the airport perimeter. Solar collection from the runways and heat sinks in the Thames minimise annual power consumption.

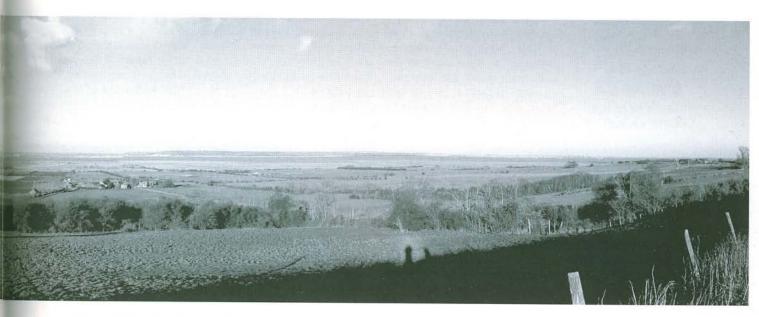
On-site solar and tidal power generation serves the airport systems and surface access. A high percentage of the airport surface access is by rail, for both passengers and employees. In summary the system provides the most sustainable, solution for aviation capacity.

#### Policy convergence

The adoption and implementation of Thames Reach Tunnel represents an integration of existing initiatives rather than a radical change of strategy.

Thames Reach Tunnel and the subsequent airport option provide a solution to issues already raised by the following reviews and policy initiatives:

· Review of London's flood defences



- · Thames Gateway Communities Plan
- The SERAS study and new aviation capacity for the southeast
- · Thames Gateway Freight Study
- · London Orbital Study
- Crossrail
- · The OFT review of BAA's monopoly
- TCPA Aviation Policy
- SASIG Aviation Review
- Rail/Air substitution
- Rail/Road substitution
- · Sustainable power generation in the

Thames Estuary.

