

# Thames Estuary needs green growth and integrated infrastructure

## GREEN UK – EU ROUTES LOWER CARBON AUDIT AND FREEPORT ROUTES



CURRENT ROUTES ———  
ALTERNATIVE ROUTES ———  
FERRY ROUTES - - - - -

### DONCASTER TO HAMBURG

	Road (km)	Sea (km)	Time (min)	Total CO <sub>2</sub> (kg)
Dover – Calais	1137	52	16:45	97.5
Immingham – Hamburg	72	697	27:52 (+11:07)	41.0 (-58%)

### DAVENTRY TO AMSTERDAM

	Road (km)	Sea (km)	Time (min)	Total CO <sub>2</sub> (kg)
Dover – Calais	619	52	11:24	54.3
Harwich – Hook of Holland	339	195	13:25 (+2:01)	38.1 (-30%)

### LEE VALLEY TO COLOGNE

	Road (km)	Sea (km)	Time (min)	Total CO <sub>2</sub> (kg)
Dover – Calais	561	52	11:06	49.4
Tilbury – Zeebrugge	364	210	15:21 (+4:15)	40.9 (-17%)

### DUBLIN TO PARIS

	Road (km)	Sea (km)	Time (hr:mm)	Total CO <sub>2</sub> (kg)
Dover – Calais	880	171	24:07	82.0
Dublin – Cherbourg	357	725	25:13 (+1:06)	66.1 (-19%)

Diminishing HGV demand over the Dartford

Crossing for Dover-Calais

(Illustration of the Green UK – EU Routes, with notes on their lower carbon audits)

Mark Willingale: With the development control order withdrawn and loss of EU funding, now would be a good time for the National Infrastructure Commission, Climate Change Committee, Union Connectivity Review and Public Accounts Committee to review the expensive, high-impact, road-only Lower Thames Crossing Midlands-Dover HGV agenda.

And to consider whether the Post-Brexit, Post-Covid reduction in demand, along with the diversion of freight from Dover by the climate change, carbon-pricing, UK freeport and levelling-up agendas, will provide the required reduction of congestion, noise and fumes at Dartford for the investment to be redirected to Build Back Greener, by providing green-growth infrastructure that generates greater agglomeration benefits and inward investment while protecting London and the Thames Estuary from rising sea levels through to 2300.



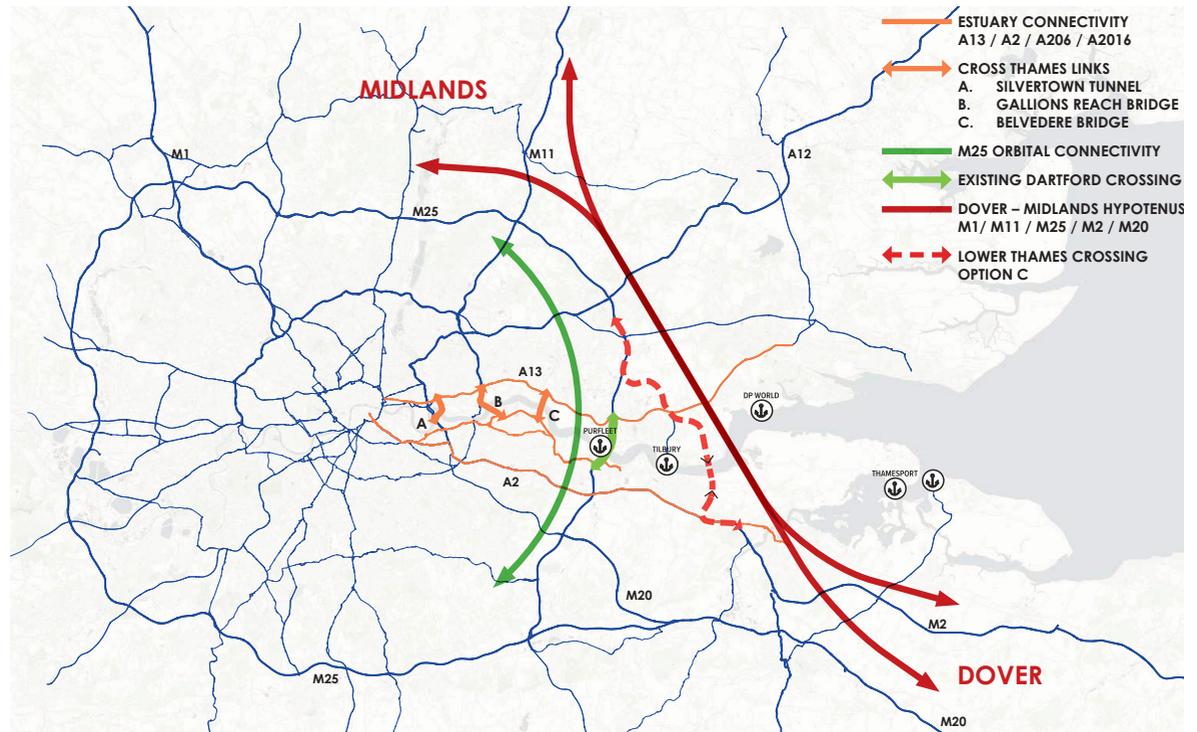
Mark Willingale is director of Metrotidal Ltd

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## DARTFORD CROSSING

### ESTUARY CONNECTIVITY VS DOVER – MIDLANDS HGV HYPOTENUSE

Greater agglomeration benefits from combining existing transport initiatives along and around the estuary (illustration of the Dartford Crossing; Estuary Connectivity vs Dover – Midlands HGV Hypotenuse)



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>>> The predict and prescribe plan for the road only Lower Thames Crossing (LTC), to relieve congestion over the Dartford Crossing, was driven by conventional Midlands/Dover HGV demand, not improved connectivity across the Thames Estuary, for which a wider spread of multimodal links would be preferable. The local LTC A13/A2 connectivity improvements are more a sop to Thurrock and Gravesham, who bear the brunt of the congestion, noise, and fumes, than purposeful improvements to multimodal Essex – Kent connectivity and beyond.

Since January, more than half of Ireland-France freight is taking the direct sea route rather than the UK land bridge, to avoid red tape. Already, this represents a drop of up to 80,000 HGVs per annum using the UK land bridge to Dover, before the direct Ireland-France sea route is widely adopted and optimised.

Once the carbon-audit fuel savings of the direct sea route and the relief from noise and fumes are considered, there is a strong case for most of the Ireland-France freight to go the direct sea route, removing demand from the Dartford Crossing and Dover. In the meantime, Post-Brexit trade with Europe is down and the Post-Covid passenger services that subsidise the frequent ferries at Dover for freight are also down reducing the attraction and efficiency of the Midlands- Dover HGV axis. The lull in passengers has also released capacity on the fixed link through the Channel Tunnel enabling a switch from HGVs to rail freight, again reducing HGV demand for the Dartford Crossing and Dover.

The UK Major Ports Group found that UK east coast ports can handle 3.6m ro-ro units per annum as well as 1.2m TEU lo-lo short-sea containers, representing 60 per cent of total UK-European trade in 2018, equivalent to all the ro-ro units and containers passing through the Dover straits. The lower carbon audits per tonne of these longer sea routes provide a compelling

case for more traffic to be diverted from Dover to the east coast ports. The Transport for the North, Northern Freight and Logistics Report predicted that by 2033 there would be a reduction of 40m tonnes per annum in goods moved from Southern Ports to the North of England, a figure now likely to be exceeded as freight is diverted from Dover.

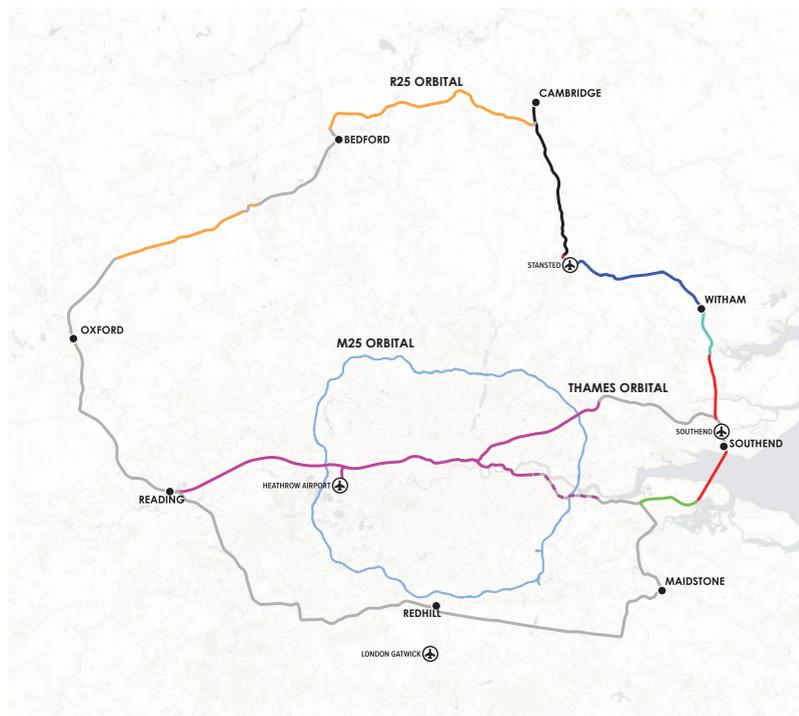
The climate change and levelling-up benefits have been recognised by the UK freeport proposals approved by Budget 2021. These proposals include the Thames Freeport, submitted by the consortium of London Gateway, the Port of Tilbury and Ford Dagenham, to provide a more direct, low-carbon transhipment route for London and the Southeast, reducing traffic congestion and HGV demand over the Dartford Crossing. The recently completed Tilbury 2 ro-ro facility reported a 20 per cent year-on-year increase in unaccompanied freight volumes between Tilbury and Zeebrugge, leading P&O Ferries to add an additional vessel to cope with the higher demand. The port expansion has been designed to operate without the LTC and make full use of rail freight.

Already these developments have diverted capacity from Dover, which has no active rail freight terminal, enabling London to reclaim its role at Britain's busiest port. The approved Haven Ports, Humber and Teesside freeport proposals also serve the climate change and levelling-up agendas by combining carbon-efficient European routes with direct rail connectivity to the Midlands including new SRFIs like the Doncaster iPort, diverting even more demand away from yesterday's inefficient Midlands-Dover HGV axis.

The LTC Option C, aiming for Dover – Calais, addresses only a part of the road hypotenuse between the M11, M25, M2 and M20. Once the current M25-M2 link has been completed attention will return to the M11 J6-8 four-lane upgrade and M11/M25

# THAMES AND R25 ORBITAL COMPONENTS

CONTRIBUTIONS TO THE 132KM THAMES ORBITAL AND 454KM R25 ORBITAL



- EXISTING RAIL LINES**  
Existing lines current in operation
- CROSSRAIL**  
Finalising construction and due to open in 2022
- SOUTHERN APPROACH**
  - C2E CROSSRAIL EXTENSION**  
Safeguarded route, with £4.85m of funding allocated for exploratory work
  - 13.4 km HOO PENINSULA**  
Funded proposals to extend services to Sharnal Street as part of the Medway Housing Infrastructure Fund to open by 2024
- NORTHERN APPROACH**
  - 79.4 km EAST WEST RAIL**  
Western section (Bicester to Bletchley) currently under construction with eastern section (Bedford to Cambridge) due to be completed by 2030
  - 34.3 km CAMBRIDGE TO STANDED**  
W10 Gauge Freight upgrade works as part of wider Cambridge to Stratford Scheme
  - 31.2km STANDED TO WITHAM**  
Essex County Council proposed scheme to reinstate Braintree Branch Line to Stansted Airport
  - 10.8 km WITHAM TO MALDON**  
Reopening of Witham to Maldon Branch Line proposed by local residents with support of local MP's Pritty Patel and John Whittingdale
- METROTIDAL CROSSING**
  - 22.6 km METROTIDAL SPECIFIC WORKS**  
Works to complete the Thames and R25 Orbitals including Metrotidal Sea Reach Link and River Crouch crossing

A programme of incremental procurement for levelling-up and inward investment (illustration of Thames and R25 Orbital Components to be completed by 2040)

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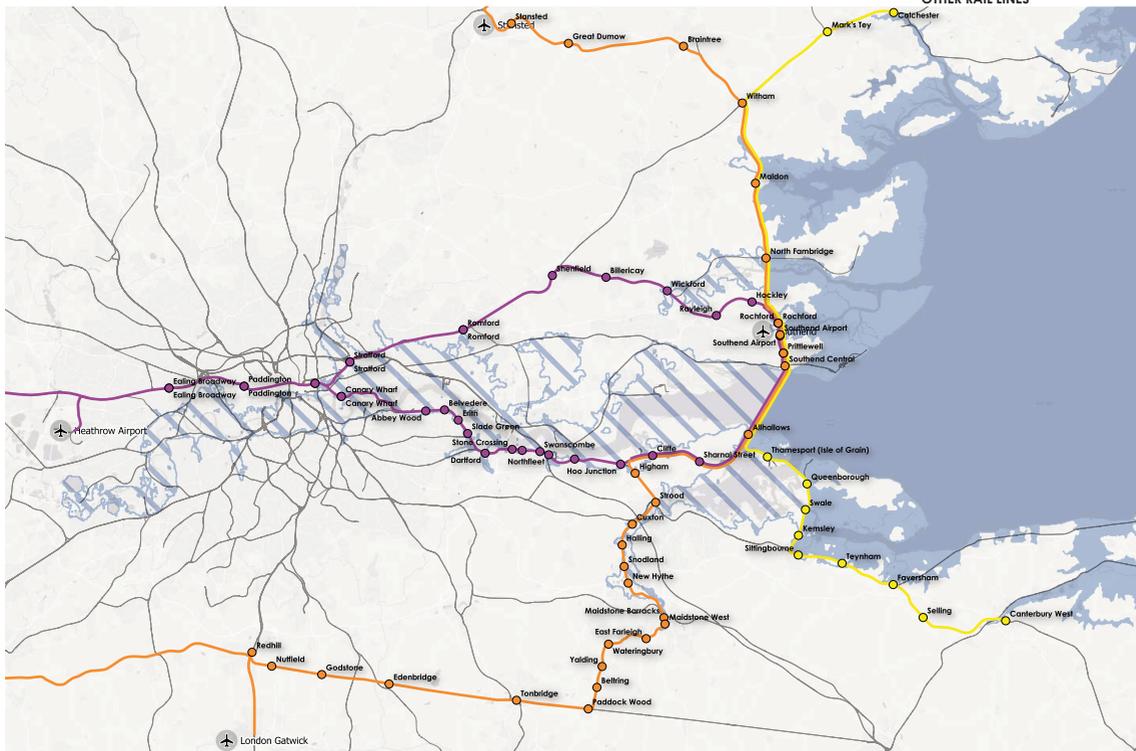
Theydon Junction improvements required in Essex and to the M2-M20 motorway standard A229 upgrade required in Kent. These upgrades raise the overall road-only LTC Midlands – Dover hypothesis costs from a current estimated budget of £6.4 - 8.2bn to £9 - £12bn. The LTC might have been conceived as a candidate for reclaiming EU Trans-European Transport Network (TEN-

T) funds but Post-Brexit there are no funds to reclaim.

Much greater green-growth agglomeration benefits compatible with the levelling-up agenda can be achieved for a third of this cost from a programme of smaller, more manageable transport improvements spread along the estuary over a longer period, some of which are already underway while others are being

## COASTAL FLOOD DEFENCE FOR THE THAMES, MEDWAY, CROUCH AND BLACKWATER ESTUARIES

- 2050 FLOOD RISK**
- 2050 PROTECTED AREA**
- R25 ORBITAL**
- THAMES ORBITAL + CROSSRAIL**
- COLCHESTER TO CANTERBURY COASTAL**
- OTHER RAIL LINES**



Greater green-growth agglomeration benefits from integrated infrastructure (illustration of the Coastal Flood Defence of the Orbitals)

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## SEA REACH LINK FLOOD DEFENCE WITH 300M OPEN THROTTLE AND 3KM RAIL TUNNEL WITH RENEWABLES AND DATA DISTRIBUTION

Greater resilience  
(illustration of the Sea  
Reach Link)



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>>> researched. Landward of the Dartford Crossing the £1.2bn Silvertown Tunnel is already underway and bridges have been proposed for Gallions Reach and Belvedere. These will relieve congestion and release capacity at the Dartford Crossing for its principal role in serving the London Orbital. Seaward of Dartford the £4.85m feasibility study for the radial Crossrail to Ebbsfleet C2E extension is well advanced and would work in tandem with the landward Gallions Reach bridge providing a DLR link from Barking Riverside to Abbey Wood.

The approved £170m Medway Housing Infrastructure Fund includes £63m to be invested by 2022 for extending rail passenger services from Strood and Gravesend to Sharnal Street on the Hoo Peninsula. This leaves only 4.4km along the existing line, to Middle Stoke and Allhallows-on-Sea from where the Metrotidal Thames + Medway + R25 rail orbitals, integrated with coastal flood defences, renewables, and data distribution, cross the Sea Reach of the Thames to Southend in Essex, as described by recent *Planning in London*, Issues 112, 113 and 114 and on the webpage [www.metrotidal.com](http://www.metrotidal.com).

There are similar rail projects north of the estuary that contribute to the Metrotidal Thames + Medway + R25 orbitals. Work is already well advanced on the East West Rail connection between Oxford and Cambridge, due to be completed by 2030. The line from Cambridge to Stansted forms part of the proposed Cambridge - London W10 gauge upgrade for freight.

Essex County Council are seeking to reopen the Stansted - Braintree Line to provide east -west rail connectivity to the coast. New trains have been provided for the existing Braintree to Witham Line, where the single track can be dualled in due course. The Secretary of State for the Home Department Priti Patel (MP for Witham) and John Whittingdale (MP for Maldon), have submitted a bid, supported by residents, for reopening the Witham - Maldon Line. With these initiatives and the recently

upgraded Southend Victoria Line, only the 12.8km Metrotidal route across the estuary from the existing line at Middle Stoke on the Hoo Peninsula to Southend Victoria is required to complete the 132km Metrotidal Thames Orbital between Reading and Southend and only another 9.8km of new line would complete the 454km twin-track R25 orbital of London and the Southeast.

Together the current and proposed landward and seaward connections described above, accompanied by a reduction in the Midlands-Dover HGV demand, will relieve congestion over the Dartford Crossing for a third of the cost, while providing a new orbital framework for the Thames estuary and beyond, with very significant green-growth benefits.

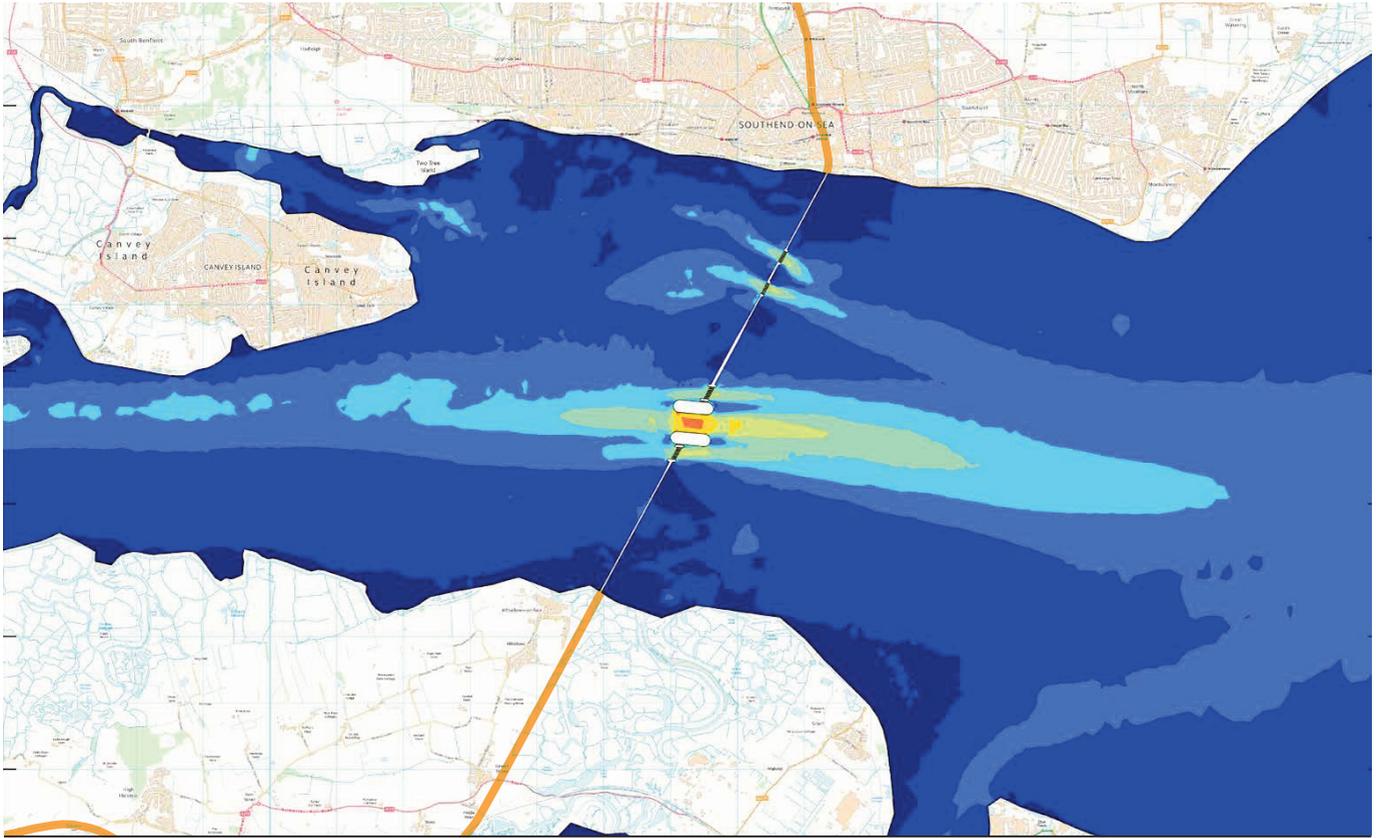
The demand for these new orbitals, already developing pre-covid with initiatives including East-West Rail and the Transport for the South East rail orbital, will be increased by the post-covid redistribution of population from Central London to the suburbs, satellite towns and downstream each side of the outer estuary. This redistribution may well become systematic, as recognised by the recent GLA report on the economic future of the Central Activities Zone by Ove Arup and others.

The scale and purpose of the LTC are in conflict with the levelling-up agenda. The feasibility studies alone will cost almost as much as the entire £160m budget for reopening the Ashington to Newcastle Line to passengers, for a project that directs Midlands HGVs to and from Dover. The Union Connectivity Review rail tunnel to Northern Ireland, with a provisional budget of £20bn, is a levelling-up project in the North commensurate with the road-only LTC. The tunnel would direct rail freight from Ireland to the UK east coast ports, from where the sea routes to Europe will result in a lower carbon audit, again reducing demand for the Dartford Crossing and the proposed Highways England LTC.

A spread of smaller, co-ordinated initiatives along the Thames

# Metrotidal Sea Reach Flood Defence

FLOOD DEFENCE WITH 300M OPEN THROTTLE AND 3KM RAIL TUNNEL WITH RENEWABLES AND DATA DISTRIBUTION



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estuary, like the C2E extension and the £170m Medway Housing Infrastructure Fund, provides comparable projects for the levelling-up agenda while completing components of the Thames and R25 Orbitals that will attract inward investment and generate substantial long term agglomeration benefits.

At present separate flood defence, transport, renewables and data programmes are being applied by separate government departments to the Thames Estuary region and beyond. Just two of these, the Environment Agency's Thames Estuary TE2100 adaptive flood management programme and the Highways England LTC proposal, have current budgets that when combined exceed £12bn. The Metrotidal proposals integrate infrastructure to reduce the costs and increase the benefits.

The cost of publicly funded flood defences is reduced and accompanied by match funding from inward investment. The flood defences contribute to the rail crossing of the Thames and the rail wayleaves contribute to the new data and renewables R25 ring main for the Southeast. The integrated Metrotidal proposals provide greater green-growth agglomeration benefits for a third of the cost while protecting London and the Thames Estuary, including the tideway habitats, from rising sea levels. The same strategy can be applied to urban estuaries around the UK to address the risks of rising sea levels, as described by *Planning in London* issue 113.

Even if carbon emissions are brought under control in this century sea levels will continue to rise in the next. The current Environment Agency EA/TE2100 adaptive flood management plan for London and the Thames Estuary seeks to spend as little as possible as late as possible and has only just begun to look beyond

the year 2100. The Metrotidal TE2200 adaptive flood management plan seeks to spend as little as possible as productively as possible by integrating flood defence with green-growth infrastructure. Instead of postponing the main flood risk measures to beyond 2070 because of their cost they can be brought forward with integrated infrastructure to generate agglomeration benefits and inward investment.

The current EA/TE2100 programme of works can continue to 2035 and thereafter become the TE2200 adaptive flood management plan to protect London and the Thames Estuary through to 2300. The flood defence measures, integrated with green-growth infrastructure, reduce the programme costs and generate agglomeration benefits. Higher flood defence costs that only reduce risk are replaced by lower costs that provide investment in green-growth infrastructure with greater resilience.

With infrastructure projects being stress-tested for their climate-change credentials, now would be a good time for the National Infrastructure Commission, Climate Change Committee, Union Connectivity Review and Public Accounts Committee to review the road-only LTC hypotenuse aimed at Dover.

After the current landward, road-only projects including the Silvertown Tunnel have been implemented there is a strong case for postponing any further road crossings of the Lower Thames to beyond 2040, by which time the decarbonisation of road transport should be well underway. In the meantime, on-going research will provide certainty on rising sea levels, enabling Metrotidal's TE2200 adaptive flood management programme for subsidising flood defence with integrated infrastructure to be brought forward from 2070 to 2040. ■

ABOVE:  
Climate Change programme to 2040  
(Illustration of Metrotidal Sea Reach Flood Defence)