

Lower Thames Crossing

Pre-Consultation Scheme Assessment Report

Volume 2: Introduction and Existing Conditions

Section 13: Appendices

Volume 2

Lower Thames Crossing
Route Consultation 2016

Contents

	Description
Appendix 2.1	Previous Studies References
Appendix 2.2	Key Plan
Appendix 2.3	Public Rights of Way and Cycle Routes
Appendix 2.4	Existing Geology and Mining
Appendix 2.5	Existing Utilities
Appendix 2.6	Highway and River Operation and Maintenance
Appendix 2.7	Air and Noise Constraints and Air Quality Modelling Receptor Locations
Appendix 2.8	Landscape/ Townscape Constraints
Appendix 2.9	Historic Environment Constraints
Appendix 2.10	Biodiversity Constraints
Appendix 2.11	Water Constraints
Appendix 2.12	Community Land Use Constraints

Appendix 2.1

Previous Studies References

Previous Studies References

Title	Date	Client	Author(s)
Assessment of Lower Thames Crossing Capacity	November 2008	Essex County Council and Kent County Council	Gifford, MVA Consultancy and Capita
Dartford River Crossing Study into Capacity Requirement	January 2009	Department for Transport/ Highways Agency	Parsons Brinckerhoff
Lower Thames Capacity Study: Option A	March 2010	Department for Transport/ Highways Agency	Halcrow Hyder Joint Venture (HHJV)
Dartford Crossing Review of Financing Options	March 2010	Department for Transport	PricewaterhouseCoopers
Delivering a Sustainable Transport System London to Dover/ Channel Tunnel Final Report	May 2010	Kent County Council	Jacobs
The Lower Thames Crossing (KPMG Regeneration and Funding Report)	August 2010	Kent County Council	KPMG
Third Thames Crossing Regeneration Impact Assessment	May 2012	Kent County Council, Essex County Council and Thurrock Council	URS
Review of Lower Thames Crossing Options: Final Review Report	April 2013	Department for Transport	AECOM
Review of Lower Thames Crossing Options: Output 2 Design & Costing Report	April 2013	Department for Transport	AECOM
Options for a New Lower Thames Crossing; Consultation Document	May 2013	Department for Transport	Department for Transport
Options for a New Lower Thames Crossing; Consultation Response Summary	December 2013	Department for Transport	Department for Transport
Module 1: Lower Thames Crossing Study: Comparative Air Quality Assessment of Options	May 2014	Department for Transport	Jacobs
Module 2: Scoping the cost of potential environmental mitigation of Option C	May 2014	Department for Transport	Jacobs/ AECOM
Module 3: Potential Additional Network investment at M25 Junction 30 and on the A13	May 2014	Department for Transport	Jacobs/ AECOM
Module 4: Integration of Option A with the M25 and A282	May 2014	Department for Transport	Jacobs/ AECOM
Module 5: Review of Potential Employment and Housing Growth	May 2014	Department for Transport	Jacobs
Technical Note Overall Cost Information for Options A+ and C2	May 2014	Department for Transport	Jacobs/ AECOM
Government Response to Consultation: Options for a New Lower Thames Crossing	July 2014	Department for Transport	Department for Transport

Appendix 2.2

Key Plan

Key Plan



This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the controller of Her Majesty's Stationery Office. Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. AL 1000048 (2014)

P01	S5	18-01-16	SAR ISSUE	M R G	M R	G H
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chk'd	Apprv'd

Client

Halcrow Hyder Joint Venture
 Burderop Park
 Swindon, SN4 0QD
 Tel. +44(0)1793 812479
 

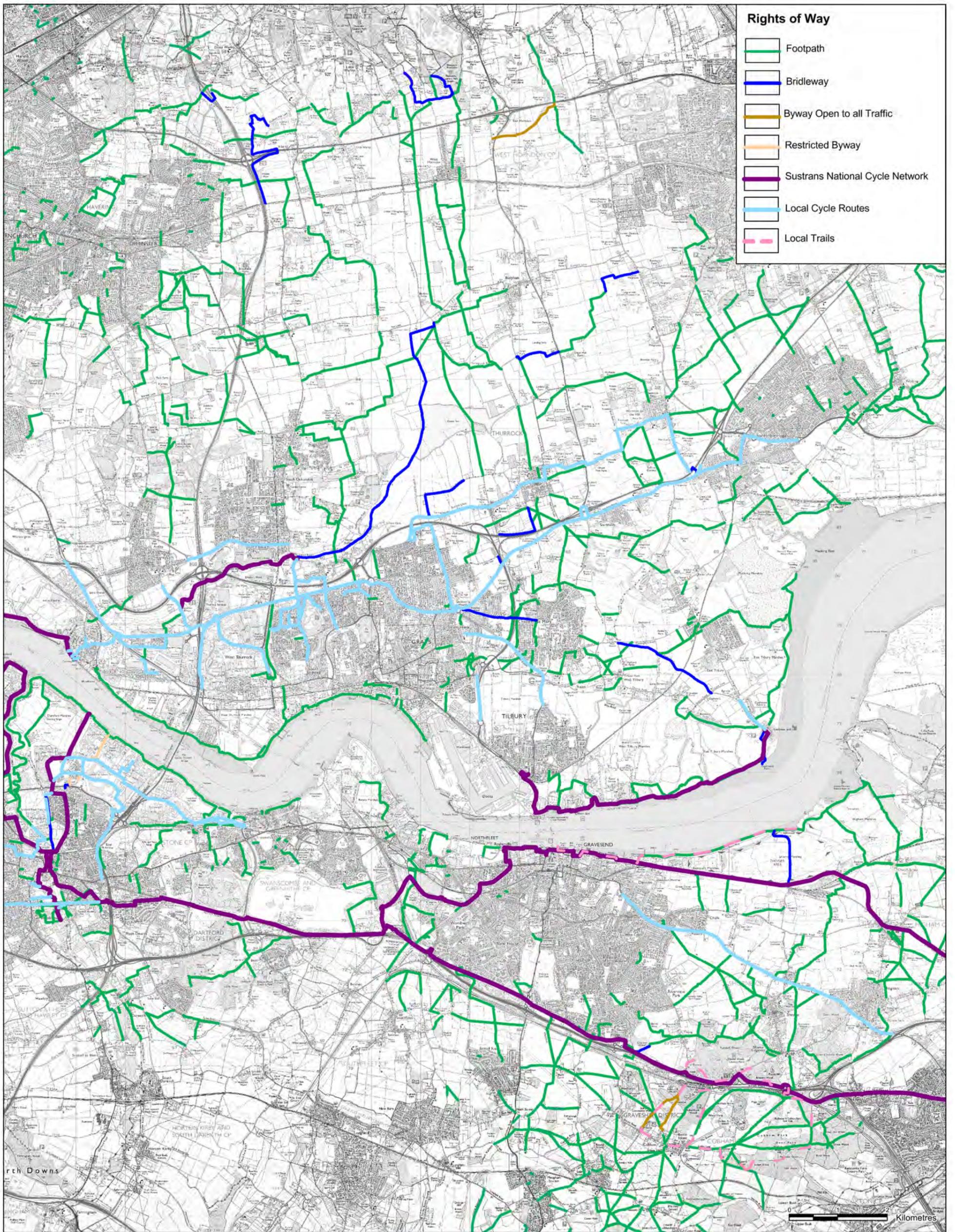
Project
LOWER THAMES CROSSING
 Drawing title
Key Plan

Status	S5	Revision	P01
Scale	NTS	Date -	13-01-16
Drawn By	M Rojas-Gómez		
Checked By	M Robinson		
Approved By	G Hodge		
Project No.	HA PIN	Originator	Original Size
	HA540039	HHJ	A1
Drawing number	HML-ZZZZZZZZZZ-DR-RD-1002		

Appendix 2.3

Public Rights of Way and Cycle Routes

Public Rights of Way and Cycle Routes



Rights of Way

	Footpath
	Bridleway
	Byway Open to all Traffic
	Restricted Byway
	Sustrans National Cycle Network
	Local Cycle Routes
	Local Trails



Copyright © Crown copyright and database rights 2015 Ordnance Survey 100030649		Client highways england Halcrow Hyder Joint Venture Burdopp Park Swindon, SN4 0DD Tel: +44(0)1793812479 		Project LOWER THAMES CROSSING Drawing Title Public Rights of Way and Cycle Routes		Status S5 Revision p01 Date 18/01/2016	
Scale 1:70,000		Drawn By M.MUTALE		Checked By S.RIMELL		Approved By A.SAUNDERS	
Project No. HA540039		Originator HHJ		Original Size A3		Drawing Number HHJ-EGN-ZZZZZZZEG-MP-EN-0013	
P01 S5 18-01-16 SAR Issue NM SR AS The design shown on these drawings is illustrative and may be subject to change in later stages of the scheme development.		Rev Status Rev Date Purpose of revision Drawn Chk'd Apprv'd					

Appendix 2.4

Existing Geology and Mining

Existing Geology and Mining

Existing Geology and Mining

A2.4.1. Existing Geology

A2.4.1.1 The generalised geological succession of the study area is summarised in **Table 1**. For Geological plans refer to the SAR Volume 4 **TABLE 1 -**

GENERALISED GEOLOGICAL SUCCESSION

System / Period	Series	Group	Formation	General Description	Stratigraphical Thickness
Quaternary	Holocene		Alluvium	Marine and Estuarine Alluvium Silt and clay with lenses and beds of peat, and seams of sand and gravel.	1 - 20m
Quaternary	Pleistocene		Head Deposits Terrace Gravels (Taplow Gravel) (Lynch Hill Gravel) (Boyn Hill Gravel) (Black Park Gravel)	Undifferentiated, pebbly sandy clay; some gravel. River Terrace Deposits - Gravel, sandy and clayey in part.	Not identified
Palaeogene	Eocene	Thames Group	London Clay Formation Harwich Formation	Dark bluish to brownish grey clay, containing variable amounts of fine-grained sand and silt. Cross-bedded shelly sand (the Oldhaven Beds) with a basal pebble bed.	Up to 150m 0 - 12m
Palaeogene	Palaeocene	Lambeth Group No Group	Woolwich Formation Upnor Formation Thanet Sand Formation	The upper beds are clay with shells, ferruginous sand, lignitic sand and lignite. The lower beds are coarse sand with pale grey clay partings and coarse gravel of black flint. Greenish to brownish grey silty, fine-grained sand, clayey and more silty in lower part, with a conglomerate of flint pebbles and nodular flints at the base.	5-20m Up to 32m
Cretaceous	Upper Cretaceous	Upper Chalk Group	Undivided, mainly Seaford Chalk Lewes Chalk	Fossiliferous nodular chalk with bands of nodular flints, hardgrounds and marl seams.	Up to 70m 20 – 40m

System / Period	Series	Group	Formation	General Description	Stratigraphical Thickness
				White chalk with hard nodular beds.	

Notes: Excludes stratigraphical units that are absent from the study area. Stratigraphical thicknesses have been taken from Geological Maps.

- A2.4.1.2 The study areas for Locations A and C are situated on the southern limb of the London Basin syncline, which include the strata up to the Thames Group. The strata dips very gently to the northwest at generally less than 2 degrees. Unconformably overlying the Upper Chalk in the central part of the London Basin are Palaeogene deposits, which are mainly comprised of the Thanet Sand Formation and Lambeth Group, these are dominated by sands and clays. The Thames Group (mainly the London Clay Formation) is also present, although mainly in the area north of the A13.
- A2.4.1.3 The Palaeogene and Late Cretaceous deposits are overlain in places by Quaternary deposits mainly of Alluvium (with peat lenses and beds), River Terrace and Head Deposits. The Alluvium deposits are most evident along the River Thames channel and subsidiary river channels, such as the Mardyke and the River Darent. The River Terrace Deposits are also present in places below the Alluvium to varying thicknesses. River Terrace Deposits dominate the hill tops and higher ground, especially to the north and also to the south of the River Thames valley.
- A2.4.1.4 In the north, generally north of the Mardyke channel, around Ockendon but also continuing eastwards to Orsett, the London Clay Formation is present below the River Terrace and Head Deposits. It is shown in outcrop in many places where there have been old quarries and pits. However, most of these areas are shown on the geological maps as Worked Ground (described as mainly chalk, sand and gravel pits with little or no fill), and as Worked Ground and Made Ground (described as wholly or partly backfilled pits). The natural London Clay outcrops begin to appear intermittently around North Ockendon and become more regular in the far north of the study area near Little Warley along the A127 and to the east of the A128.
- A2.4.1.5 South of the Mardyke Valley and north of the West Thurrock and Tilbury Marshes, the higher ground and hill tops consist of River Terrace Deposits overlying the Lambeth Group and Thanet Sand Formation; these in turn unconformably overlie the Upper Chalk Formation. In the West Thurrock area, where the land slopes gently towards the West Thurrock Marshes, the Upper Chalk is shown in outcrop. Although most of the area is shown as Worked Ground, which is described as mainly chalk, sand and gravel pits with little or no fill on the geological maps and Worked Ground and Made Ground, which is described as wholly or partly backfilled pits. Similarly on the south side of the River Thames Valley the Upper Chalk outcrops on the lower sides of the hills, although in the western area from Swanscombe to Dartford it is shown with hatching identifying Worked Ground and Worked Ground and Made Ground.

A2.4.2. Mining

- A2.4.2.1 Quarrying of sand and gravel for building materials and the excavation of chalk and clay for the manufacturing of cement was extensive either side of the River Thames, the majority of which has now ceased. The chalk quarries, of which there are many between the A13 in the north and the A2 in the south, were 25m deep or more. Since the end of manufacture of cement the quarries have either been backfilled with waste, left as water-filled lakes or been redeveloped for industrial, retail and residential development.
- A2.4.2.2 Chalk extraction in the area has not just been limited to open quarries. Numerous deneholes and even underground mines (beneath Dartford) are present throughout the area from the A13 south to the A2. Deneholes comprise a small shaft excavated down to the chalk off which small adits were driven. The chalk mining in this way was undertaken in medieval times and was used for liming agricultural fields. Some deneholes are known to have been constructed in pre-Roman times. The location of deneholes is very difficult to predict and several of these were encountered during the construction of HS1.
- A2.4.2.3 North of Junction 30 (M25), gravel, sand and clay extraction was extensive. In many locations the underlying deposits of London Clay have been excavated for cement production, in particular north of South Ockendon. The mining that occurred around Ockendon reached its zenith post 1920. At one point 1.5 million tonnes were extracted per annum from a quarry. The clay was mixed with water to turn it to slurry, allowing it to be pumped to a cement plant in Grays initially, and later to a plant in Northfleet for addition to the raw cement mix. This involved an 11km pipeline beneath the Thames. As aforementioned the remains of these pits are depicted as outcropped London Clay or worked ground due to the majority being backfilled with landfill material. Information provided by the current landfill operator during previous studies suggests the backfilled pit known as Area 3 at Ockendon was licensed to accept hazardous waste within the last 40 years in the form of asbestos and liquid toxic for a period of time after changes in legislation. Area 3 is still operational and is planned to be extended to the east, although it does not accept hazardous waste anymore. It is unknown when this ceased and the amount of waste accepted.
- A2.4.2.4 Other areas of chalk, sand and gravel extraction have occurred near the A2 at Shorne, the surrounding land between East Tilbury and Chadwell St Mary and around Junction 30 of the M25 and along the A13. The majority of these have been backfilled with landfill material.

Appendix 2.5

Existing Utilities

Existing Utilities

Existing Utilities

A2.5.1.1 Existing utility information has been obtained from utility companies for Locations A and C. This process has identified the location and type of significant utility infrastructure within the Study Area. The key utilities are described below.

Location A

- A2.5.1.2 On the south side of the River Thames there is a sub-surface medium pressure gas pipeline crossing beneath existing A282 on the approximate line of Bow Arrow Lane south footway.
- A2.5.1.3 On the south side of the River Thames there is one or more sub-surface oil pipeline(s) at Junction 1a crossing the A282 roughly perpendicular to the carriageways. The depth of the oil pipeline(s) is currently unknown.
- A2.5.1.4 On the south side of the River Thames is an existing high voltage overhead electricity line that originates from Littlebrook Power Station. The electricity line crosses over Junction 1a in the east-west direction and again at a skew in the north-west direction around the fast track bus route.
- A2.5.1.5 On the north side of the River Thames there are overhead electricity lines that cross existing A282 between Junction 31 and Junction 30.
- A2.5.1.6 There is a National Grid underground power cable tunnel (Dartford Cable Tunnel) crossing the river and running parallel approximately 120m to the west of the existing Dartford west tunnel. It is understood to carry National Grid high voltage cables and underground cables (including those associated with the existing tunnel ventilation buildings) and drainage.
- A2.5.1.7 On the north side there are various sub surface national grid conductors and high voltage cables.
- A2.5.1.8 Other utility infrastructure within Location A includes low voltage cables, fibre optic cables, telephone lines, drainage pipes, technology and lighting cabling and infrastructure.

Location C

- A2.5.1.9 On the south side of the River Thames are overhead electricity lines and a major gas pipeline. Adjacent to the A2 near Cobham London Road services there is a large electricity pylon and associated overhead cables. These overhead cables go north over the A2, approximately 1km to the east of Chalk and then over the Thames and Medway Canal west of the railway sidings.
- A2.5.1.10 There are overhead cables from the east which generally run parallel with the Thames and Medway Canal and these cables connect into a large pylon on the south bank of the River Thames to the east of the Metropolitan Police Specialist Training Centre. At this point the cables go beneath the river in a cable tunnel in a north westerly direction towards Tilbury power station.
- A2.5.1.11 On a similar alignment to the overhead cables there is a National Grid gas pipeline that runs under the A2 and north east towards the river where it crosses the river via a tunnel towards Coalhouse Fort.

- A2.5.1.12 On the north side of the river there are a large number of overhead cables that originate at Tilbury power station and run north.
- A2.5.1.13 The gas pipeline from south of the river runs between West Tilbury and East Tilbury and then north, eventually crossing the A127 to the east of the A127/ A128 grade separated junction.
- A2.5.1.14 Within Location C there is a significant amount of other utility infrastructure, this includes low voltage cables, fibre optic cables, telephone lines and sewer pipes.

Appendix 2.6

Highway and River Operation and Maintenance

Highway and River Operation and Maintenance

Highway and River Operations and Maintenance

A2.6.1 Highway Operations and Maintenance

A2.6.1.1 Connect Plus operate and maintain the Dartford Crossing and its approaches under the M25 DBFO Contract, a 30 year concession contract which commenced in 2009 (see Figure 1).

A2.6.1.2 Area 4 is maintained by Balfour Beatty Mott Macdonald (BBMM) on behalf of Highways England (see Figure 1)

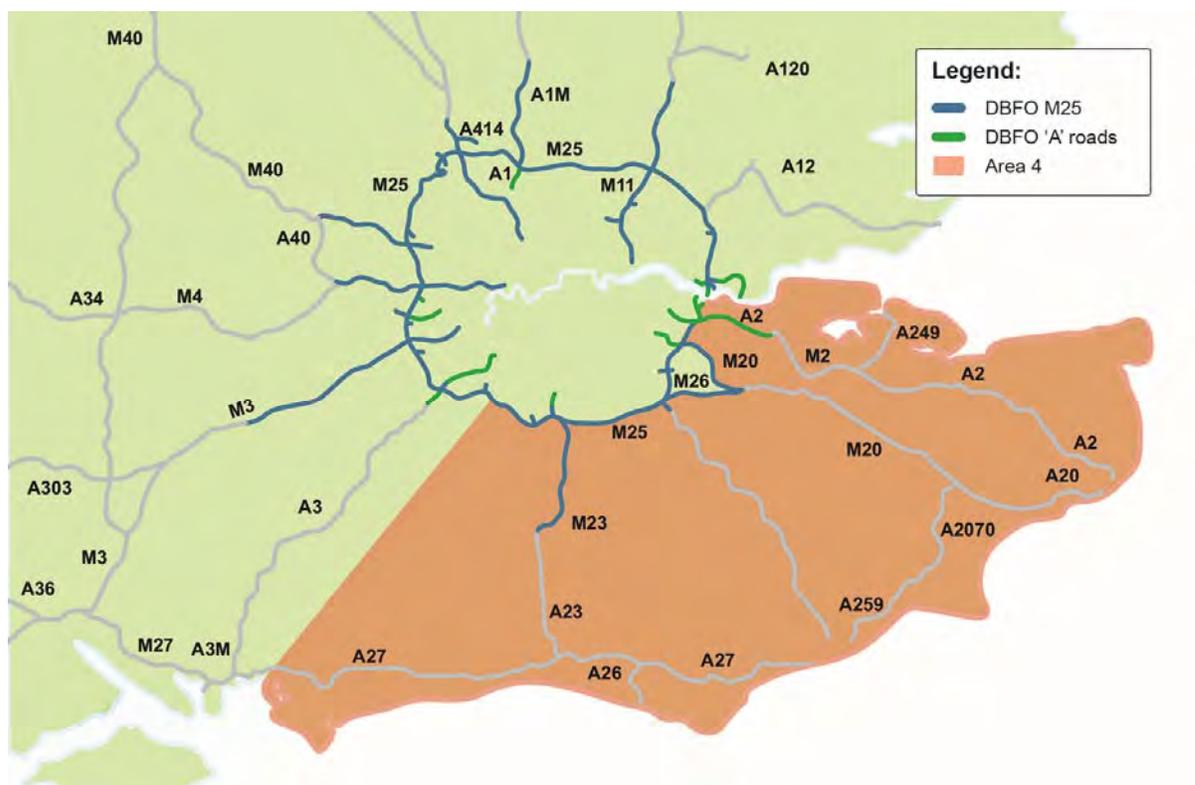


FIGURE 1 - EXTENT OF M25 DBFO AND AREA 4 CONTRACTS

- A2.6.1.3 At present the motorway network is accessed via short/medium term stops on the hard shoulder or under traffic management following the road space booking procedure. Off network access is also used in some locations.
- A2.6.1.4 At the Dartford Tunnels, maintenance is undertaken during planned closures. On the QEII Bridge, maintenance is carried out during lane closures or full bridge closures.
- A2.6.1.5 The existing tunnel system includes fire detection and suppression systems, public address (PA) system, lane control signs, Communications/SCADA (Supervisory Control and Data Acquisition), emergency services radio/telephone re-broadcast system, tunnel specific CCTV, drainage & pumping systems, ventilation and road lighting and emergency lighting. This is operated from the Dartford River Crossing Control Centre (DRCC) which is located adjacent to the southern end of the crossing. There are two compounds where Highways England Traffic

Officers and Traffic Management (TM) crews are located to provide immediate assistance for incidents on the crossings. Additionally there are twelve observation points at the extents of the crossing which Highways England Traffic Officers can use to gain access to the crossing to assist road users. There is currently a northbound and a southbound depot which have a TM crew and Traffic Officers on site enable small incidents to be dealt with quickly on site. Communication with the Highways England Traffic Officers and TM crews is managed by Connect Plus via the DRCC.

A2.6.2 River Operations

- A2.6.2.1 The River Thames is Britain’s busiest inland waterway, handling some 50m tonnes of cargo each year and contributing over £3bn to the economy annually. Each year 230,000 commercial and leisure vessels pass within the Port of London’s 95 miles of river and estuary between Teddington and the North Sea. Of these, 10,000 larger vessels are guided by Thames pilots annually.
- A2.6.2.2 Marine traffic information produced by the Port of London Authority (PLA) consisting of shipping data from May 2011 to January 2015 has been analysed for each of the locations being considered.

Location A

- A2.6.2.3 The number of vessel movements along the River Thames at Location A are summarised in **Figure 2**:

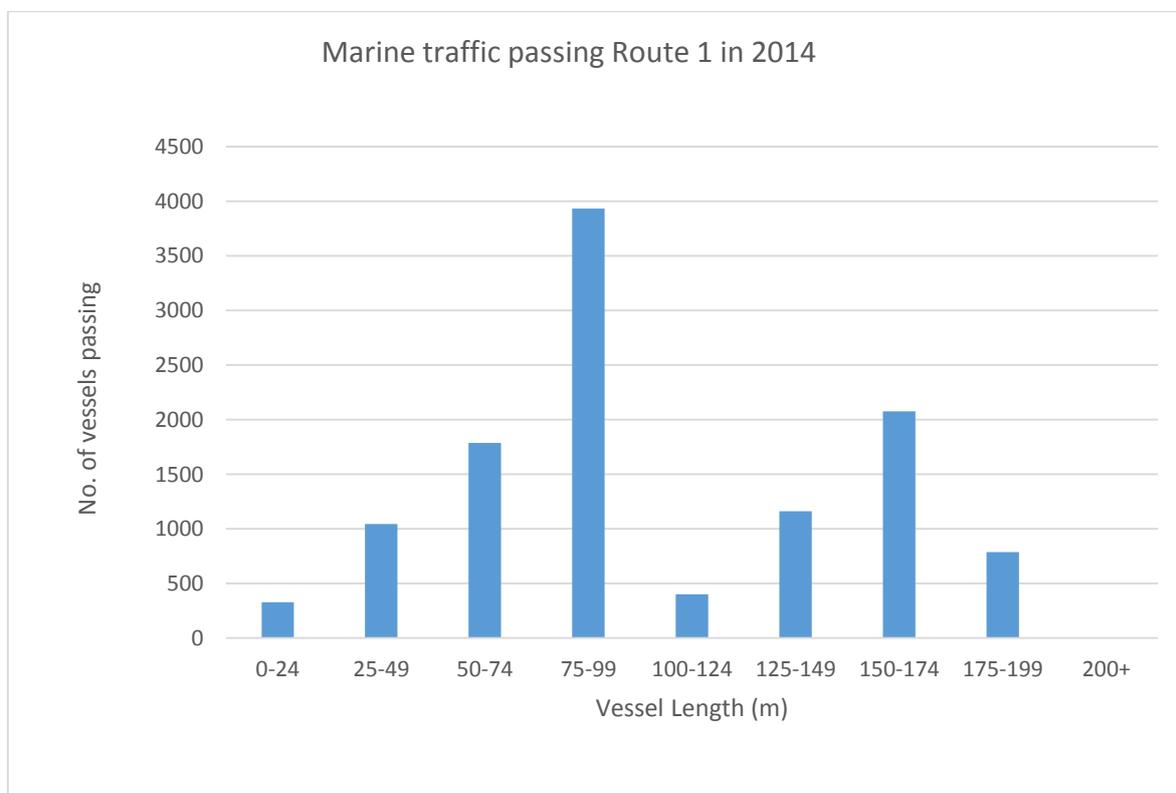


FIGURE 2 - MARINE TRAFFIC LOCATION A

Location C

A2.6.2.4 The number of vessel movements along the River Thames at Location C are summarised in **Figure 3**

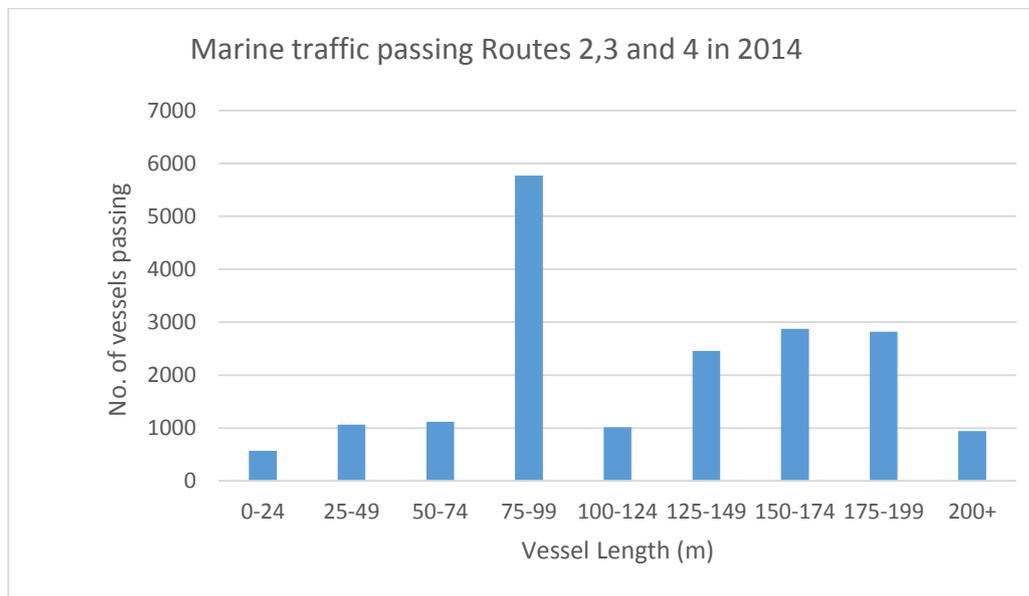


FIGURE 3 - MARINE TRAFFIC LOCATION C

A2.6.3 Future Marine Traffic

A2.6.3.1 At present limited information is available on the future development anticipated in:

- The ports and berths along the River Thames.
- The volume of marine traffic navigating the locations.
- The size of the vessels navigating the locations.

A2.6.3.2 This information is in the process of being requested from relevant stakeholders under the stakeholder engagement process. In the absence of this information, a functional assessment of the river channel, constraints and physical limitations has been undertaken to determine the initial design vessels that can traverse the river and use the terminals.

A2.6.3.3 Based on the information currently available, the minimum air draft clearance for shipping at Location A is 57.5m AOD over a clear width of 100m and 50m AOD over an additional 205m. Bridge pylon foundations would likely require to be designed for similar levels of accidental ship collision as the existing crossing (accidental head on impact of a 65,000 Dead Weight Tonnage (DWT) vessel fully laden or in ballast approaching at 10 knots).

A2.6.3.4 Based on the information currently available, the minimum air draft clearance for shipping at Location C is assumed as 75.19m AOD over a clear width of 305m. Bridge pylon foundations located in the river would require to be designed to resist the accidental ship collision loads. For a structure spanning approximately 800m at Location C, the likely design

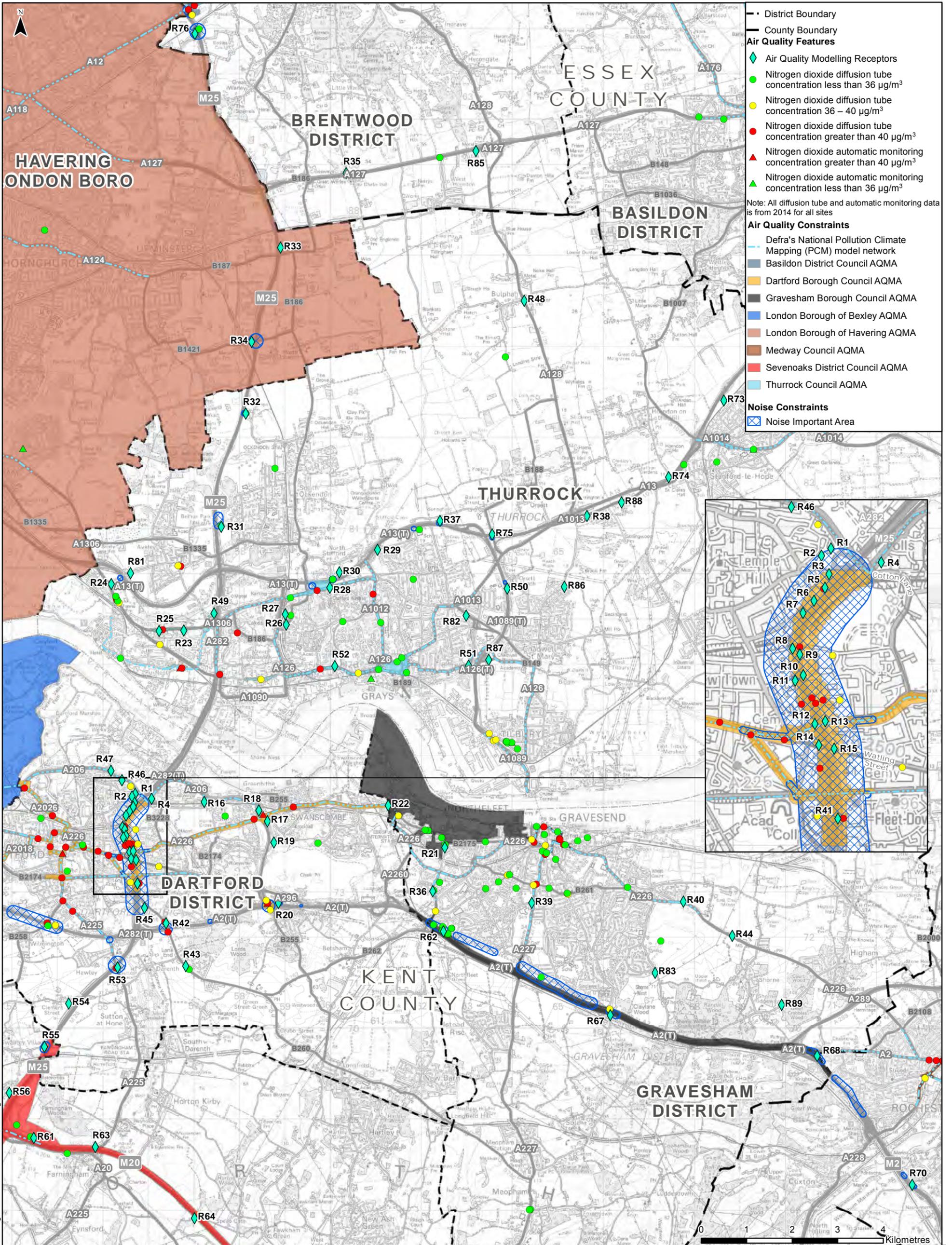
vessel is assessed as a 120,000 DWT vessel fully laden or in ballast approaching at 10 knots. If the span is reduced and the main pylon foundations moved to deeper water then the likely design vessel is assessed as increasing to 145,000 DWT vessel fully laden and in ballast.

- A2.6.3.5 The final design vessels would be determined from a risk analysis which would be undertaken if a bridge solution is selected.

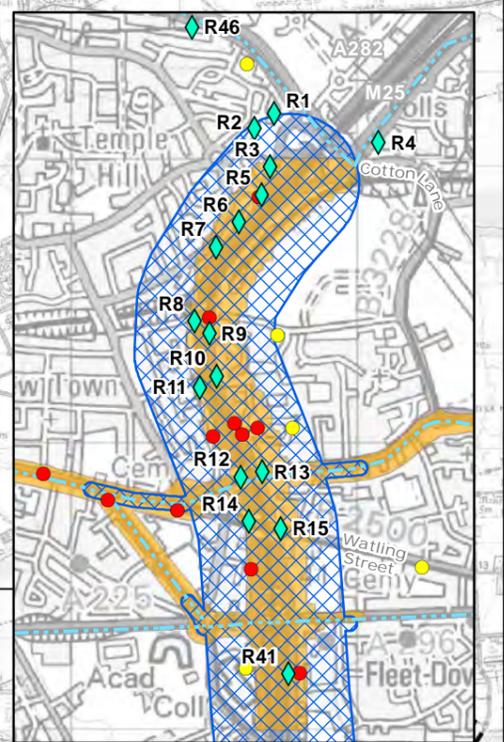
Appendix 2.7

Air and Noise Constraints and Air Quality Modelling Receptor Locations

Air and Noise Constraints and Air Quality Modelling Receptor Locations



- District Boundary
- County Boundary
- Air Quality Features**
 - ◆ Air Quality Modelling Receptors
 - Nitrogen dioxide diffusion tube concentration less than 36 µg/m³
 - Nitrogen dioxide diffusion tube concentration 36 – 40 µg/m³
 - Nitrogen dioxide diffusion tube concentration greater than 40 µg/m³
 - ▲ Nitrogen dioxide automatic monitoring concentration greater than 40 µg/m³
 - ▲ Nitrogen dioxide automatic monitoring concentration less than 36 µg/m³
- Note: All diffusion tube and automatic monitoring data is from 2014 for all sites
- Air Quality Constraints**
 - Defra's National Pollution Climate Mapping (PCM) model network
 - Basildon District Council AQMA
 - Dartford Borough Council AQMA
 - Gravesham Borough Council AQMA
 - London Borough of Bexley AQMA
 - London Borough of Havering AQMA
 - Medway Council AQMA
 - Sevenoaks District Council AQMA
 - Thurrock Council AQMA
- Noise Constraints**
 - Noise Important Area



Path: K:\U\Projects\UA007080-Lower Thames Crossing\GIS\Environmental Planning\HA540039-HHJ-EGN-ZZZZZZEG-MP-EN-007.mxd

Copyright © Crown copyright and database rights licensed under Defra's Public Sector Mapping Agreement with Ordnance Survey (licence No. 100022861) and the Land and Property Services Department (Northern Ireland) M0U206. Contains Ordnance Survey data © Crown copyright and database rights 2015 Ordnance Survey 100030649

Client **highways england**

Halcrow Hyder Joint Venture
Burdorpe Park
Swindon, SN4 0QD
Tel. +44(0)1793 812479

Halcrow Hyder

Project **LOWER THAMES CROSSING**

Drawing Title **Air and Noise Constraints and Air Quality Modelling Receptor Locations**

Status	S5	Revision	P01
Scale	1:75,000	Date	18/01/16
Drawn By	L.HULME		
Checked By	S.RIMMELL		
Approved By	A.SAUNDERS		
Project No.	HA PIN	Originator	Original Size
HA540039	HHJ		A3
Drawing Number	HHJ-EGN-ZZZZZZEG-MP-EN-007		

P01	S5	18/01/16	SAR ISSUE	LH	SR	AS
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chk'd	Appr'd

Appendix 2.8

Landscape/ Townscape Constraints

Landscape/ Townscape Constraints



- District Boundary
- County Boundary
- Area of Outstanding Natural Beauty (National value)
- Green Belt (Regional value)

Path: K:\U\Projects\UA007080-Lower Thames Crossing\GIS\Environmental Planning\mxd\HA540039-HHJ-EGN-ZZZZZZZEG-MP-EN-008.mxd

Copyright
 © Natural England copyright 2015.
 © Contains Ordnance Survey data
 © Crown copyright and database
 rights 2015 Ordnance Survey
 100030649

Client

Halcrow Hyder Joint Venture
 Burderop Park
 Swindon, SN4 0QD
 Tel. +44(0)1793 812479

Project LOWER THAMES CROSSING

Drawing Title Landscape / Townscape Constraints

Status	S5	Revision	P01
Scale	1:75,000	Date	18/01/16
Drawn By	L.HULME		
Checked By	S.RIMELL		
Approved By	A.SAUNDERS		
Project No.	HA PIN	Originator	Original Size
HA540039	HHJ		A3
Drawing Number	HHJ-EGN-ZZZZZZZEG-MP-EN-008		

P01	S5	18/01/16	SAR ISSUE	LH	SR	AS
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd

Appendix 2.9

Historic Environment Constraints

Historic Environment Constraints

Appendix 2.10

Biodiversity Constraints

Biodiversity Constraints



Path: K:\U\Projects\HA007080-Lower Thames Crossing\GIS\Environmental Planning\mxd\HA540039-HHJ-EGN-ZZZZZZEG-MP-EN-0010.mxd

Copyright © English Heritage 2015. © Natural England 2015. Contains Ordnance Survey data © Crown copyright and database rights 2015 Ordnance Survey 100030649	Client highways england	Project LOWER THAMES CROSSING	Status S5	Revision P01
Scale 1:80,000	Date 18/01/16	Drawn By L.HULME	Checked By S.RIMMEL	Approved By A.SAUNDERS
Project No. HA540039	HA PIN HHJ	Originator Original Size	A3	
Drawing Number HHJ-EGN-ZZZZZZEG-MP-EN-010				

Client highways england	Project LOWER THAMES CROSSING
Drawing Title Biodiversity Constraints	
Client Halcrow Hyder Joint Venture Burdorpe Park Swindon, SN4 0QD Tel. +44(0)1793 812479	
Halcrow Hyder	

Project LOWER THAMES CROSSING	Status S5	Revision P01
Scale 1:80,000	Date 18/01/16	Drawn By L.HULME
Checked By S.RIMMEL	Approved By A.SAUNDERS	Project No. HA540039
HA PIN HHJ	Originator Original Size	A3
Drawing Number HHJ-EGN-ZZZZZZEG-MP-EN-010		

Client highways england	Project LOWER THAMES CROSSING
Drawing Title Biodiversity Constraints	
Client Halcrow Hyder Joint Venture Burdorpe Park Swindon, SN4 0QD Tel. +44(0)1793 812479	
Halcrow Hyder	

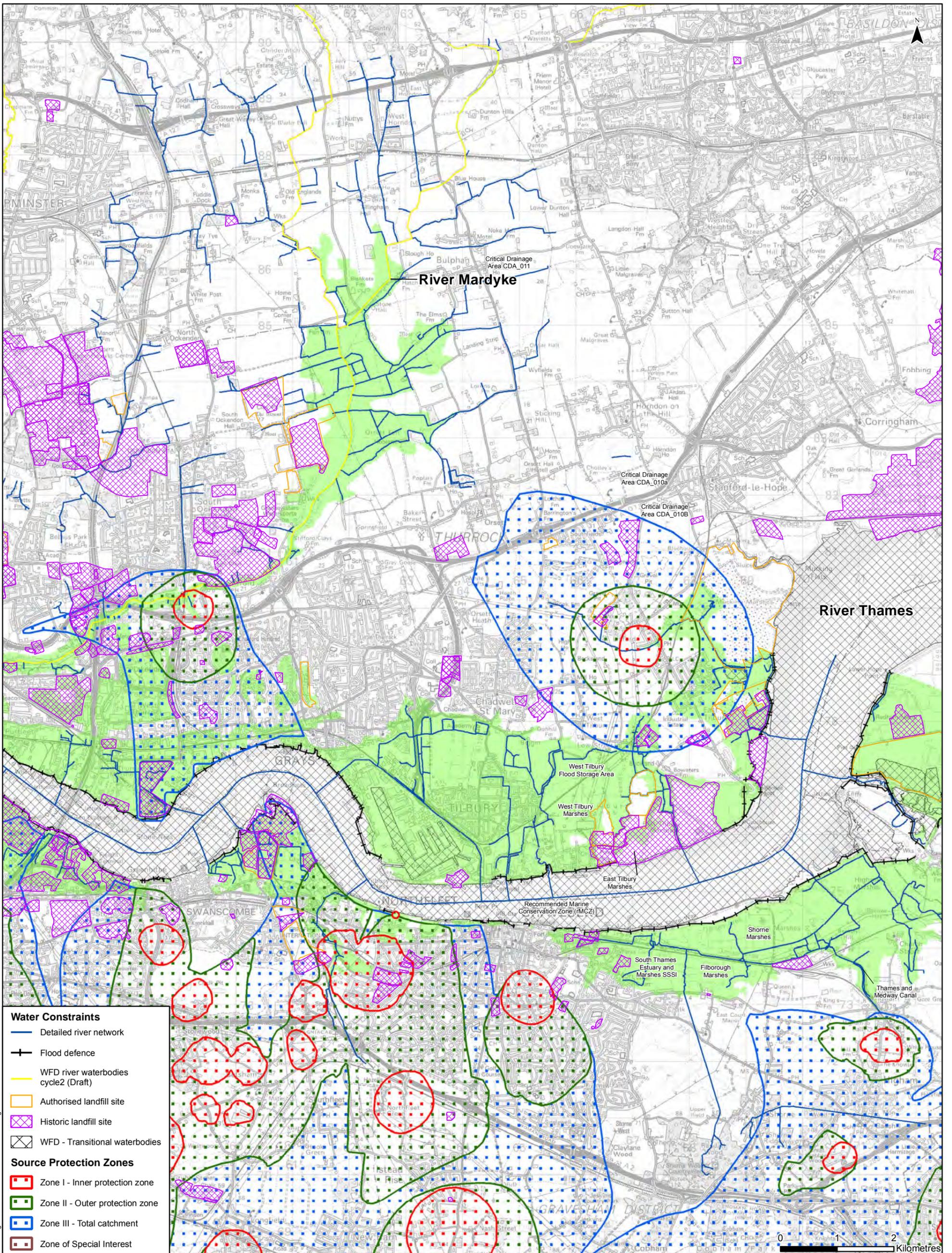
Project LOWER THAMES CROSSING	Status S5	Revision P01
Scale 1:80,000	Date 18/01/16	Drawn By L.HULME
Checked By S.RIMMEL	Approved By A.SAUNDERS	Project No. HA540039
HA PIN HHJ	Originator Original Size	A3
Drawing Number HHJ-EGN-ZZZZZZEG-MP-EN-010		

P01	S5	18/01/16	SAR ISSUE	LH	SR	AS
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chk'd	Appr'd

Appendix 2.11

Water Constraints

Water Constraints



Water Constraints

- Detailed river network
- Flood defence
- WFD river waterbodies cycle2 (Draft)
- Authorised landfill site
- Historic landfill site
- WFD - Transitional waterbodies

Source Protection Zones

- Zone I - Inner protection zone
- Zone II - Outer protection zone
- Zone III - Total catchment
- Zone of Special Interest

Path: K:\U\Projects\UA007080-Lower Thames Crossing\GIS\Environmental\Planning\mxd\HA540039-HHJ-EGN-ZZZZZZEG-MP-EN-0011.mxd

Copyright
© Environment Agency copyright 2015.
Contains Ordnance Survey data © Crown
copyright and database rights 2015
Ordnance Survey 100030649



Halcrow Hyder Joint Venture
Burdorpe Park
Swindon, SN4 0QD
Tel. +44(0)1793 812479



Project **LOWER THAMES CROSSING**

Drawing Title

Water Constraints

Status	S5	Revision	P01
Scale	1:60,000	Date	18/01/16

Drawn By	L.HULME
Checked By	S.RIMELL
Approved By	A.SAUNDERS

Project No.	HA PIN	Originator	Original Size
HA540039	HHJ		A3

Drawing Number

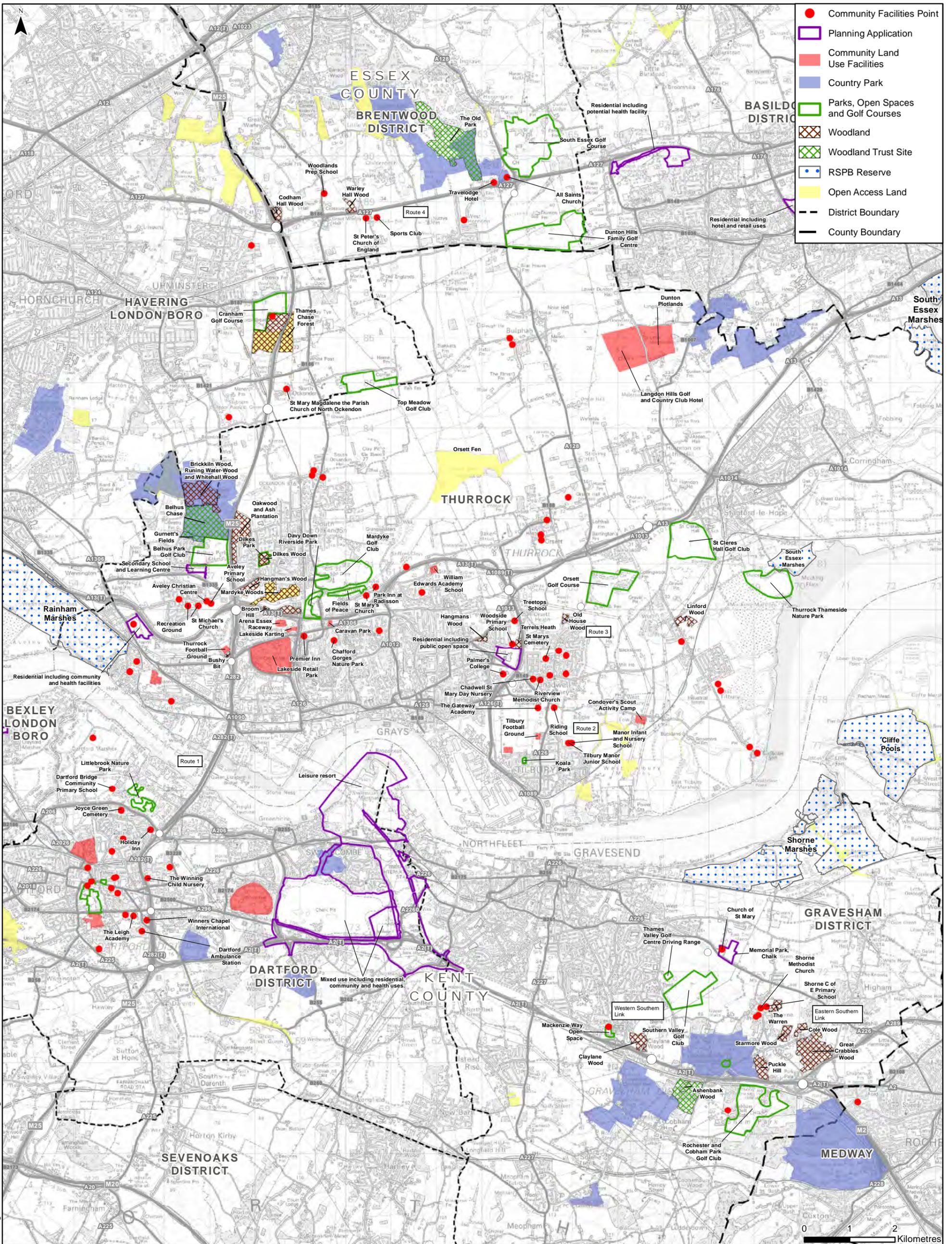
HHJ-EGN-ZZZZZZEG-MP-EN-011

P01	S5	18/01/16	SAR ISSUE	LH	SR	AS
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chk'd	Apprv'd

Appendix 2.12

Community Land Use Constraints

Community Land Use Constraints



Path: K:\U\Projects\HA007080-Lower Thames Crossing\GIS\Environmental Planning\mxd\HA540039-HHJ-EGN-ZZZZZZZZEG-MP-EN-0012.mxd

Copyright
 © Natural England copyright 2015.
 Contains Ordnance Survey data © Crown copyright
 and database rights 2015 Ordnance Survey
 100030649.
 Data reproduced with the permission of RSPB.
 © Crown Copyright. Ordnance Survey licence
 number 100021787 2016

**ILLUSTRATIVE
DESIGN**

The design shown on these drawings is illustrative
 and may be subject to change in later stages of the
 scheme development.

Client



Halcrow Hyder Joint Venture
 Burderop Park
 Swindon, SN4 0QD
 Tel. +44(0)1793 812479



Project **LOWER THAMES
CROSSING**

Drawing Title **Community Land Use
Constraints**

Status	S5	Revision	P01
Scale	1:75,000	Date	18/01/16
Drawn By	L.HULME		
Checked By	S.RIMELL		
Approved By	A.SAUNDERS		
Project No.	HA	PIN	Originator
HA540039	HHJ		Original Size
Drawing Number			A3
HHJ-EGN-ZZZZZZZZEG-MP-EN-0012			

P01	S5	18/01/16	SAR ISSUE	LH	SR	AS
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chk'd	Appr'd

If you need help accessing this or any other Highways England information, please call **0300 123 5000** and we will help you.

© Crown copyright 2016.

You may re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence: visit www.nationalarchives.gov.uk/doc/open-government-licence/ write to the **Information Policy Team, The National Archives, Kew, London TW9 4DU**, or email psi@nationalarchives.gsi.gov.uk.

This document is also available on our website at www.gov.uk/highways

If you have any enquiries about this publication email info@highwaysengland.co.uk or call **0300 123 5000***. Please quote the Highways England publications code **PR133/15**

Highways England creative job number s150687

Report No HA540039-HHJ-ZZZ-REP-ZZZ-010

*Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and must count towards any inclusive minutes in the same way as 01 and 02 calls. These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone. Calls may be recorded or monitored.

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ
Highways England Company Limited registered in England and Wales number 09346363

The Pre-Consultation Scheme Assessment Report details the assessment of options leading up to consultation. A final Scheme Assessment Report will be published post consultation.