national highways

Lower Thames Crossing

7.2 Planning Statement (Tracked changes version)

APFP Regulation 5(2)(q)

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Lower Thames Crossing

7.2 Planning Statement (Tracked changes version)

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1 Executive summary

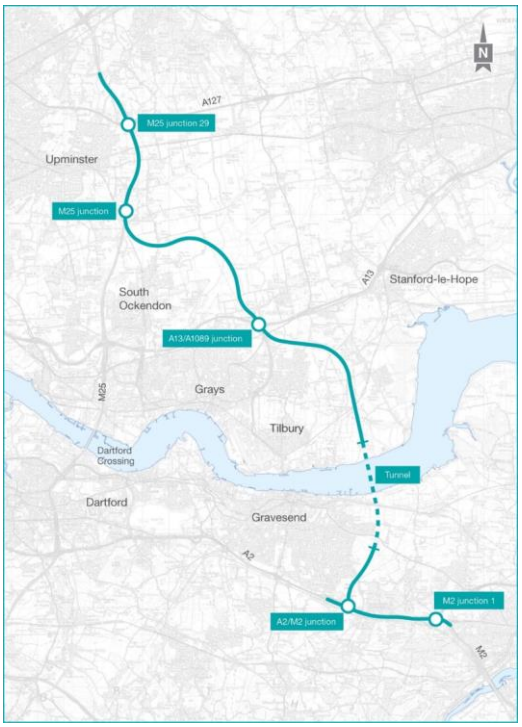
1.1.1 National Highways (the Applicant) is applying to the Secretary of State for Transport (SoS) for a Development Consent Order (DCO) under section 37 of the Planning Act 2008 (the Act) to construct, operate and maintain the A122 Lower Thames Crossing (the Project).

1.1.2 The Project qualifies as a Nationally Significant Infrastructure Project (NSIP) under section 14 of the Act.

1.1.3 The Project would provide an additional crossing of the River Thames, east of London, to reduce long-standing experiences of significant congestion at the Dartford Crossing. It would increase road capacity and would provide additional resilience to the Thames crossings and the Strategic Road Network (SRN) in the south-east of the Country.

1.1.4 The Project would comprise a new road connection, the A122, between the A2 and M2 in Kent, east of Gravesend, crossing under the River Thames through two bored tunnels, before joining the M25 south of junction 29. The Project would be approximately 23km long, 4.25km of which would be in twin tunnels. The proposed route of the Project is shown in Plate 1.1 below.

Plate 1.1 Lower Thames Crossing Route



1.1.5 The Project is located within the administrative boundaries of nine local authorities in Kent, Essex, London and Thurrock.

1.1.6 The purpose of this Planning Statement is to act as the primary reference document for the assessment of the Project against the relevant planning policy and legislative framework. It signposts, as appropriate, to relevant chapters of the Environmental Statement (ES) and other pertinent reports and assessments which comprise the comprehensive and detailed evidence base produced in support of this Application. The Environmental Statement [**Document References 6.1, 6.2 and 6.3**] has been updated, and should be read with reference to the latest version of the Environmental Statement Addendum [**Document Reference 9.8**].

1.1.7 Section 104(2) of the Planning Act 2008 states that in deciding an application, the SoS must have regard to:

a. any relevant NPSs

b. any appropriate marine policy documents (if any)

c. any Local Impact Report (LIR) submitted to the Secretary of State

d. any matters prescribed in relation to development of the description to which the application relates

e. any other matters which the SoS thinks are both important and relevant to the SoS's decision.

1.1.8 The key NPS against which this Project will be determined is the 2014 National Policy Statement for National Networks (NPSNN). Delivery of the Project also requires the diversion of an existing overhead powerline, and three works to divert existing gas pipelines, which qualify as NSIPs in their own right. These fall to be assessed against the relevant Energy NPSs (NPSEN-1, NPSEN-4 and NPSEN-5) published in 2011 and, in so far as they may be relevant to the Project, the revisions to these Energy NPSs published in November 2023.

1.1.9 Full details of how the Project accords with the requirements of the NPSNN are presented in Appendix A to this Planning Statement. Appendix B presents the same in respect of the Energy NPSs (and, so far as they are relevant, the 2021 draft revisions to the Energy NPSs). The Applicant has submitted a commentary on the weight to be afforded the final versions of the NPSs published in November 2023 in its Deadline 9 submission Applicant's response to ExA ISH 12 AP23 on Suite of Energy National Policy Statements [**Document Reference 9.211**].

1.1.10 In line with the requirements of provision 104(2)(d) of the Act, consideration has been given to a number of 'other matters' including, inter alia, the NPS for Ports, the National Planning Policy Framework (NPPF) and local development plan policy. Appendix C to the Planning Statement presents consideration of the Project's alignment with relevant local development plan policy.

1.1.11 In developing the design and route of the Project, the Applicant has considered a number of different alternatives, including alternatives to the provision of a new river crossing, alternative forms of crossing, different route corridors for a crossing and different orientations of routes within those route corridors. Design

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alternatives have also been considered throughout the evolution of the application for the Project.

1.1.12 During the design and evolution of the Project the Applicant has undertaken extensive engagement with statutory bodies, key stakeholders and local communities. Feedback from these parties has resulted in refinements of the Project design so far is practicable and reasonable.

1.1.13 There is a clear and compelling need for the Project and its delivery would result in substantial public benefits including:

Public benefits	
Transport	The Project would provide additional road capacity and river crossing east of London, significantly improving road space supply to serve the traffic demand.
	The additional road space would not be challenged by design limitations (e.g. no sub-optimal junction layout, no need for escorting, no wind related concerns, etc.).
	An additional crossing would provide an alternative crossing option across the river east of London and a more resilient road network in the Lower Thames area.
	The Project would significantly reduce traffic congestion at the Dartford Crossing.
	Many journeys on both sides of the river, as well as those that cross the river, would be quicker.
	The Project would follow the latest safety standards and would decrease the accident rate.
	Cross-river journey time reliability would be improved, with less frequent delays and uncertainty.
	The Project would be significantly beneficial to the business transport users wishing to cross the River Thames east of London.
Communities and environment	Improved cross-river local trips to community by way of an additional crossing and less congested Dartford Crossing.
	Enhanced connectivity and facilities for walkers, cyclists and horse riders
	Reduced congestion in Dartford area would decrease noise and air pollution.
	The Project would leave a positive legacy of green infrastructure and improved biodiversity.
	Improved access to local jobs and upskilling opportunities for local communities.
Economic	Faster and more reliable journeys and improved accessibility would boost the productivity of businesses in the Lower Thames area and wider region.
	Enhanced connectivity and cross-river economic opportunities would further stimulate competition, boosting employment and increasing inward investment locally and regionally.
	Benefits would be greatest for high value businesses, but also significant for the local area's lower value transport and construction sectors.

Public benefits	
	Quicker, more reliable access to key markets, resources and labour for the region's ports.
	The Project would provide value for money.

1.1.14 In spite of the public benefits, delivery of the Project would also give rise to a number of adverse impacts which are a consequence of seeking to deliver a nationally significant infrastructure of the scale and extent of the Project. These impacts have been minimised and mitigated as far as reasonably practicable through measures incorporated into the design of the Project, through bespoke additional mitigation measures and, where mitigation has not been possible, through the provision of compensatory measures.

1.1.15 The analysis of NPS accordance in this Planning Statement demonstrates that the Project is compliant with relevant planning policy, including the NPSNN. The analysis demonstrates that the proposed development would not cause any unacceptable adverse effects that, considered individually, cumulatively or as a whole, would mean the decision maker should refuse the application and, moreover, that each aspect of the proposals is acceptable in planning terms when considered against the relevant national and local policies.

1.1.16 Accordingly, the Applicant considers the policy presumption in favour of the Project and the overall planning balance lie strongly in favour of the grant of development consent.

2 Introduction to the Planning Statement

2.1 Purpose of the Planning Statement

2.1.1 This Planning Statement relates to an application (the application) made by National Highways to the Secretary of State (SoS) pursuant to section 37 of the Planning Act 2008 for a Development Consent Order (DCO) for the A122 Lower Thames Crossing (the Project) which would authorise the construction, operation and maintenance of the Project, along with the compulsory acquisition or temporary possession of all land and interests in land necessary to enable this.

2.1.2 The Project would provide an additional crossing of the River Thames, east of London, which would reduce congestion at the existing Dartford Crossing, increase road capacity and provide additional transport resilience in the south-east of the country. The Project is located within the administrative boundaries of Kent County Council, Tonbridge and Malling Borough Council, Maidstone Borough Council, Gravesham Borough Council, Essex County Council, Thurrock Council, Brentwood Borough Council, Greater London Authority and London Borough of Havering. The extent of the Project is illustrated in Plate 2.1 of this statement and on the Location Plan as part of the Book of Plans (Application Document 2.1).

2.1.3 The Planning Statement brings together relevant matters derived from the extensive evidence base supporting the Project, and considers them within the context of relevant planning policy.

2.1.4 This statement has been prepared pursuant to Regulation 5(2) of the Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009 (APFP Regulations 2009) and draws together key considerations which are relevant to the determination of the Application. While submission of this Planning Statement is not a mandatory legal requirement, it has been prepared to accompany the Application and sets out how the Project accords with the relevant National Policy Statements (NPSs) and other matters considered both important and relevant.

2.1.5 The Applicant notes that all NPSs guiding the consideration of the Application are under review by the Government and will refer to emerging text when it is available, wherever possible and relevant.

2.1.6 This Planning Statement demonstrates that the Project is in accordance with the relevant NPSs which have effect (in relation to the relevant parts) and should be granted consent pursuant to section 104 of the Planning Act 2008.

2.1.7 The Examining Authority will consider the Application and will make a recommendation to the SoS, who will decide whether development consent for the Project should be granted.

2.2 The Applicant

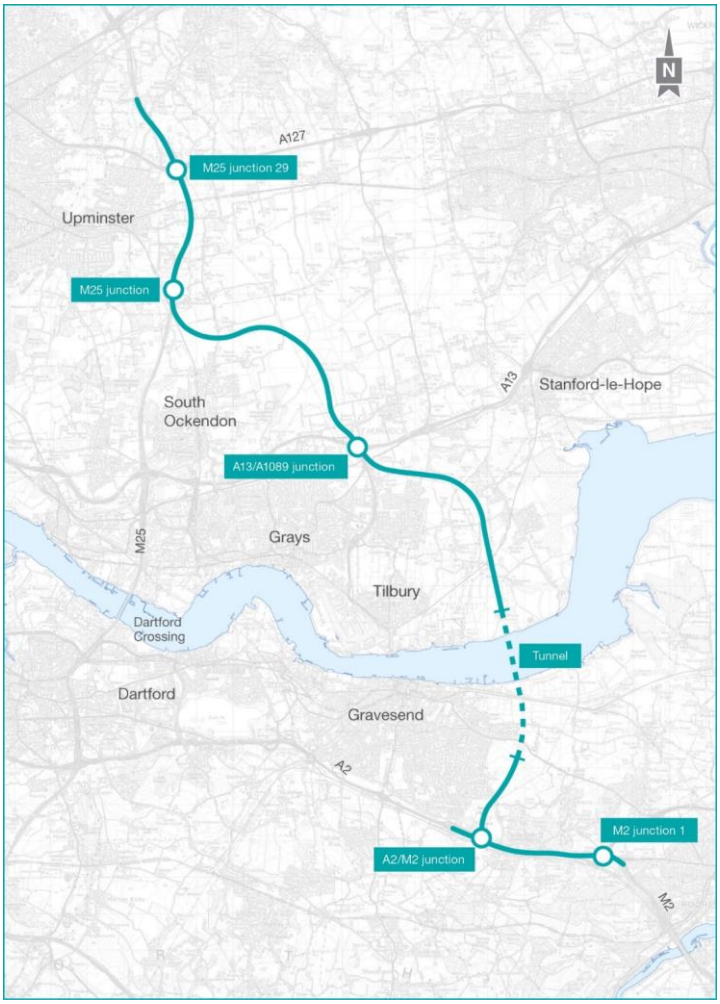
2.2.1 The Applicant for the Project is National Highways, which is the strategic highways company as defined in the Infrastructure Act 2015.

2.2.2 National Highways is the strategic highways company charged with operating, maintaining and improving England's motorways and major A-roads. Formerly the Highways Agency and Highways England, National Highways became a government-owned company in April 2015.

2.2.3 National Highways is responsible for the operation, maintenance and improvement of the strategic road network (SRN) in England.

2.2.4 National Highways would be responsible for the Project which would connect to the M25 and A2 trunk road.

Plate 2.1 Lower Thames Crossing route



2.3 Qualification as a Nationally Significant Infrastructure Project

2.3.1 The Project is a Nationally Significant Infrastructure Project (NSIP) under section 14(1)(h) of the Planning Act 2008.

2.3.2 The Project involves the construction of a highway within the meaning of section 22(1)(a) of the Planning Act 2008. The Project satisfies section 22(2)(a) in that the highway would (when constructed) be wholly located in England, National Highways as strategic highways company would be the highway authority for the highway in line with section 22(2)(b), and the area of development is greater than the relevant limit set out in section 22(4)(b), which in this case is 12.5 hectares, where the speed limits would be in excess of 50mph.

2.3.3 The Project also includes the diversion of existing utilities infrastructure that are, in their own right, considered to be Nationally Significant Infrastructure Projects (NSIPs) under sections 16 and 20 of the Planning Act 2008 in respect of the construction of three gas transporter pipelines (Work Nos. G2, G3 and G4) and the installation of an overhead electric line (Work No. OH7). Further explanation of the status of the NSIPs is included in the Explanatory Memorandum (Application Document 3.2) and summarised below.

2.3.4 With regard to the three proposed gas pipeline diversions near the A2 (Work Nos. G2, G3 and G4), each are NSIPs under section 20 of the Planning Act 2008 because the works entail the construction of gas transporter pipelines, wholly in England, that are each likely to have a significant effect on the environment, have a design operating pressure of more than 7 bar gauge and when constructed will convey gas for supply (directly or indirectly) to at least 50,000 customers. Accordingly, for each of these works, each of the conditions in sections 20(2) to (5) of the Planning Act 2008 is satisfied. In order to apply the test contained in section 20(3)(b), National Highways has prepared a screening assessment of the environmental effects of those pipe-lines with more than a 7 bar gauge (for further details see Appendix 1.3 of the Environmental Statement (ES) (Application Document 6.3)).

2.3.5 With regard to the installation of an electric line above ground near the A13 (Work number OH7), as this installation is 'wholly within England', this element of the Project is also an NSIP under sections 14(1)(b) and 16(1)(a) of the Planning Act 2008. None of the provisions in section 16(3) apply to exclude the installation of the electric line above ground: the nominal voltage is above 132kV, the length is greater than 2km, the distance between the existing line and a new support will be greater than 60m and it does fall under a category of work which would not require a consent under section 37(1) of the Electricity Act 1989 under the Overhead Lines (Exemption) (England and Wales) Regulations 2009.

2.4 Consenting framework

2.4.1 Section 104 of the Planning Act 2008 applies to decisions in cases where an NPS has effect in relation to the development of the description to which the application relates.

2.4.2 Section 104(2)(a) states that in deciding an application, the SoS must have regard to:

a. any relevant NPSs

b. the appropriate marine policy documents (if any)

c. any Local Impact Report (LIR) submitted to the Secretary of State

d. any matters prescribed in relation to development of the description to which the application relates

e. any other matters which the SoS thinks are both important and relevant to the SoS's decision

2.4.3 Section 104(3) states that the SoS must decide an application in accordance with any relevant NPS other than where certain exceptions set out in subsections (4) to (8) apply, namely, where doing so would lead to: a breach in international obligations; the SoS breaching their duties; and would be unlawful by virtue of its enactment where the SoS considers the adverse impact of a proposed development would outweigh its benefits or where any condition prescribed for deciding an application otherwise than in accordance with the NPS is met.

2.4.4 The National Policy Statement for National Networks (NPSNN) (Department for Transport, 2014) has effect in relation to the highways nationally significant infrastructure proposed. As advised at paragraph 1.2 of the NPSNN, the SoS will use this as the primary basis for making decisions on development consent applications for national networks NSIPs. A draft revision to the NPSNN was published in March 2023. The Applicant has submitted its assessment of the status and weight to be attached to this draft NPS in its Policy accordance assessment of the Project against the Consultation draft NPSNN (published March 2023) [**REP4-209**]. An updated version of this assessment is being submitted at Deadline 9 [**Document Reference 9.98 (2)**].

2.4.5 The energy-related nationally significant infrastructure which are NSIPs in their own right are required to be assessed against the Overarching National Policy Statement for Energy (NPS EN-1), National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (NPS EN-4), and National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (all Department of Energy and Climate Change, 2011) which have effect for those elements of the Project. Draft revisions to NPS EN-1, NPS EN-4 and NPS EN-5 (Department for Business, Energy and Industrial Strategy) issued in September 2021 have also been considered insofar as they may be relevant to the Project. In November 2023 the Government issued the final revised versions of these NPSs. The Applicant has submitted a commentary on the weight to be afforded the final versions of the NPSs published in November 2023 in its Deadline 9 submission Applicant's response to ExA ISH 12 AP23 on Suite of Energy National Policy Statements [**Document Reference 9.211**].

2.4.6 The NPSNN forms the 'case-making' basis for the Project, recognising that the need for the nationally significant utilities diversions arises solely from the need for the road element of the Project. Notwithstanding this, the assessment principles in each of the NPSs have been considered with equal weight. All

NPSs are designated utilising and conforming to the same legislative requirements, guidance and international obligations and accordingly, there is consistency across them.

2.4.7 As set out above, the SoS must decide the Application in accordance with any relevant NPSs along with any other matters they consider to be 'important and relevant' (as set out in more detail in Chapter 6 of this Planning Statement).

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2.4.8 The Project is not a port development and does not include any development within a port, but it does propose to utilise the River Thames for the import of some materials during construction through existing port facilities. Accordingly, there is consideration of the National Policy Statement for Ports (NPS Ports) (Department for Transport, 2012) as a matter that could be considered 'important and relevant'.

2.4.9 The National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021) is also likely to be an important and relevant consideration in decisions on NSIPs but only to the extent relevant to that project (paragraph 1.18 of the NPSNN). The NPPF Paragraph 5 states that '*the Framework does not contain specific policies for nationally significant infrastructure projects.*' Paragraph 1.19 of the NPSNN elaborates that '*…the NPPF makes clear that it is not intended to contain specific policies for NSIPs where quite particular considerations can apply. The National Networks NPS will assume that function and provide transport policy which will guide individual development brought under it'*. The NPPF is considered further in Chapter 7 of this Planning Statement explaining where its policies are relevant in providing additional guidance for the assessment of NPS policy.

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2.4.10 While the primary basis for making decisions on applications for development consent is the relevant NPSs, other matters which the SoS may consider to be important and relevant in decision making may include the development plan policies of the nine 'host' local authorities.

2.4.11 This Planning Statement has also been prepared to take account of section 60 of the Planning Act 2008 concerning the preparation of LIRs by relevant authorities, who are invited to submit an LIR, to provide '*details of the likely impact of the proposed development on the authority's area*' (and which the SoS must have regard to under section 104(2)(b)). Planning Inspectorate Advice Note One: Local Impact Reports suggests a list of topics which may be of assistance to a local authority in writing an LIR. Paragraph 4.2 includes the following topic areas:

a. 'Relevant development plan policies, supplementary planning guidance or documents, development briefs or approved master-plans and an appraisal of their relationship and relevance to the proposals

b. Relevant development proposals under consideration or granted permission but not commenced or completed'

2.4.12 This Planning Statement is therefore also intended to assist local authorities in compiling their LIRs (which are produced following acceptance of the Application) by providing relevant information.

2.5 Structure of the Planning Statement

2.5.1 The structure of this planning statement is set out below:

a. Executive summary – outlining the planning policy and consenting case for the project and demonstrating that the Project is safe to consent.

b. Chapter 2: Introduction to the Planning Statement – the purpose of the Planning Statement, its structure and how it relates to other Application Documents.

c. Chapter 3: Project Description – describes the Project by section including energy diversions, and describes the construction methodology for each element of the Project including the tunnel.

d. Chapter 4: Needs and benefits – identifies the need for the Project and the benefits it would deliver locally, regionally and nationally.

e. Chapter 5: Project evolution and alternatives – illustrates the evolution of the Project including the identification and selection of options and alternatives, demonstrates the impact of consultation and engagement on the design, and evidences the influence environmental assessment has had on the application design of the Project.

f. Chapter 6: National Policy Statement assessment – assessment to demonstrate accordance with National Policy Statements for National Networks and Energy.

g. Chapter 7: Other matters potentially both important and relevant – identification and assessment of the Project's alignment and conformity with other matters that are potentially both important and relevant, including national policy, local plan policies and allocations (including minerals, waste and transport plans and the London Plan), and consideration of emerging local plan policy where appropriate.

h. Chapter 8: Planning balance and conclusions – articulates the assessment of impacts and benefits of the Project and concludes the assessment of the Project against national policy.

2.5.2 Appendices are included in the Planning Statement to provide additional evidence and detailed assessment. These are as follows:

a. Appendix A: National Policy Statement for National Networks – Accordance Table

b. Appendix B: National Policy Statements for Energy Infrastructure – Accordance Table

c. Appendix C: Local Authority Policy Review Table

d. Appendix D: Open Space assessment and Green Infrastructure Study

e. Appendix E: Green Belt assessment

f. Appendix F: Area of Outstanding Natural Beauty assessment

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g. Appendix G: Private Recreational Facilities

h. Appendix H: Green Infrastructure Study

i. Appendix I: Carbon Strategy and Policy Alignment

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2.6 Relationship of the Planning Statement with the rest of the DCO application

2.6.1 In assessing relevant decision-making policies and demonstrating the overall planning case for the Project, this Planning Statement draws upon the conclusions of the supporting Application Documents, interpreting these against planning policy considerations which have been identified as having relevance to the Project. The Planning Statement draws upon, and should be read alongside, the following Application Documents, including (but not limited to):

a. Explanatory Memorandum to Draft DCO (Application Document 3.2)

b. Statement of Reasons (Application Document 4.1)

c. Book of Reference (Application Document 4.2)

d. Funding Statement (Application Document 4.3)

e. Consultation Report (Application Document 5.1)

f. Environmental Statement (ES) (Application Documents 6.1 to 6.3)

g. Flood Risk Assessment (FRA) (Application Document 6.3, ES Appendix 14.6)

h. Water Framework Directive Assessment (Application Document 6.3, ES Appendix 14.7)

i. Habitats Regulations Assessment (HRA) (Application Document 6.5)

j. Need for the Project (Application Document 7.1)

k. Section 106 Agreements – Heads of Terms (Application Document 7.3)

l. Project Design Report (PDR) (Application Document 7.4)

m. Design Principles (Application Document 7.5)

n. Transport Assessment (Application Document 7.9)

o. Health and Equalities Impact Assessment (Application Document 7.10)

p. Sustainability Statement (Application Document 7.11)

q. Wider Network Impacts Management and Monitoring Plan (Application Document 7.12)

r. Community Impact Report (Application Document 7.16)

s. Interrelationships with other Nationally Significant Infrastructure Projects and Major Development Schemes (Application Document 7.17)

t. Carbon and Energy Management Plan (First Iteration) (Application Document 7.19)

u. Stakeholder Actions and Commitments Register (SACR, Application Document 7.21)

2.6.2 Chapter 4 of this Planning Statement sets out the benefits that will be delivered by the Project. The DCO Application also includes a Benefits and Outcomes Document (Application Document 7.20) which provides further information on National Highways' activities that are being delivered outside the framework of the DCO and how these could deliver local benefits.

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2.6.3 A full list and description of each of the Application Documents is provided in the Introduction to the Application (Application Document 1.3).

3 Project description

3.1.1 This chapter describes the Project, the construction of the Project and identifies the 'host local authorities'. The chapter also provides a description of the utility diversions that are, in their own right, considered to be NSIPs as set out in Chapter 2.

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3.1.2 The Project is consistently described throughout the DCO Application Documents and within this Planning Statement from south to north.

3.1.3 A detailed description of the Project and its construction is provided in ES Chapter 2: Project description (Application Document 6.1).

3.2 The Project

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3.2.1 The A122 Lower Thames Crossing (the Project) would provide a connection between the A2 and M2 in Kent and the M25 south of junction 29, crossing under the River Thames through a tunnel. The Project route is presented in Plate 3.1.

3.2.2 The A122 would be approximately 23km long, 4.25km of which would be in tunnel. On the south side of the River Thames, the Project route would link the tunnel to the A2 and M2. On the north side, it would link to the A13, M25 junction 29 and the M25 south of junction 29. The tunnel portals would be located to the east of the village of Chalk on the south of the River Thames and to the west of East Tilbury on the north side.

3.2.3 Junctions are proposed at the following locations:

a. New junction with the A2 to the south-east of Gravesend

b. Modified junction with the A13/A1089 in Thurrock

c. New junction with the M25 between junctions 29 and 30

3.2.4 The Project route would be three lanes in both directions, except for:

a. link roads

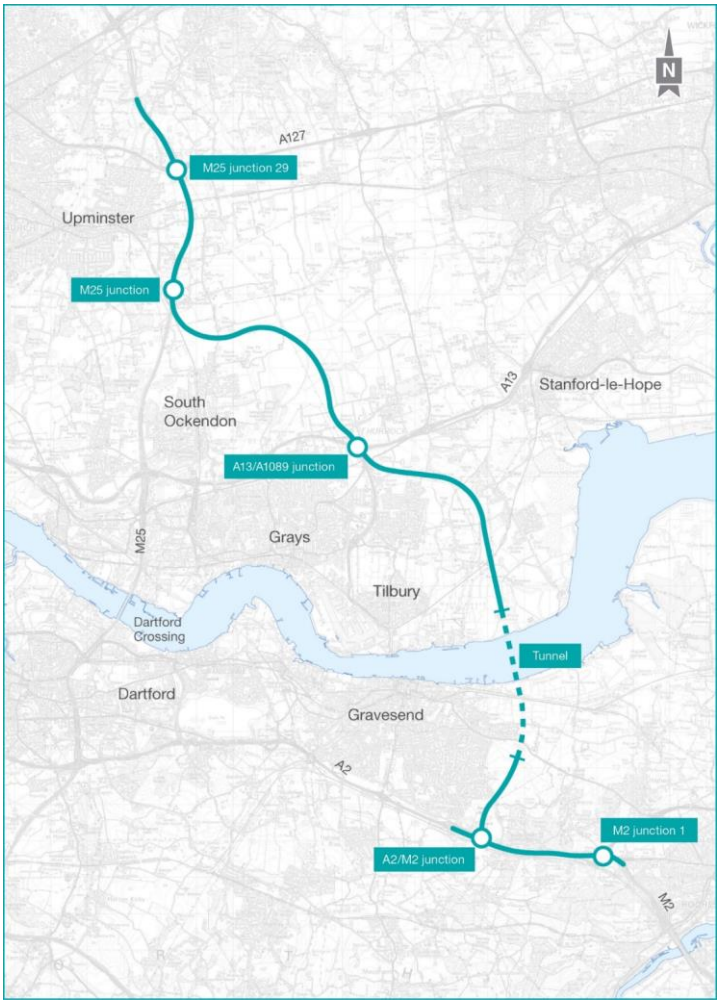
b. stretches of the carriageway through junctions

c. the southbound carriageway from the M25 to the junction with the A13/A1089, which would be two lanes

3.2.5 In common with most A-roads, the A122 would operate with no hard shoulder but would feature a 1m hard strip on either side of the carriageway. It would also feature technology including stopped vehicle and incident detection, lane control, variable speed limits and electronic signage and signalling. The A122 design outside the tunnel would include emergency areas. The tunnel would include a range of enhanced systems and response measures instead of emergency areas.

3.2.6 The A122 would be classified as an 'all-purpose trunk road' with green signs. For safety reasons, walkers, cyclists, horse riders and slow-moving vehicles would be prohibited from using it.

Plate 3.1 Lower Thames Crossing route



3.3 Junction modifications

3.3.1 Alterations would be required to both the M25 at the northern limits of the route and on the A2 at the southern end. The existing A13/A1089 junction would also require modifications to connect to the Project route.

3.4 Vertical alignment

3.4.1 The new A122 would be at varying heights along the route, with approximately 80% of its length in a cutting, false cutting or tunnel. The A2 would remain at its current level with the junction between the A2 and the A122 requiring some link roads, at or below ground level, on embankments and structures such as

bridges. As it approaches the South Portal, the A122 would be at ground level before descending into a deep cutting. To the north of the River Thames, the A122 would be lowered as much as practicable to reduce its impact on the landscape. Where the road crosses the Tilbury floodplain, railway lines, and the Mardyke floodplain, it would be elevated.

3.5 Local roads

3.5.1 The Project would include adjustment to a number of local roads. Most existing local roads affected by the Project route would be reconnected or designed to provide alternative provision. In most locations, the affected local roads would cross over the Project route.

3.6 Tunnel

3.6.1 It is currently proposed that up to two tunnel boring machines (TBMs) would be used to construct the tunnel.

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3.6.2 Emergency access and vehicle turn-around facilities would be provided at the tunnel portals. Cross-passages providing a connection between the two tunnels would be provided for emergency incident response and tunnel user evacuation. Tunnel portal structures would accommodate service buildings for control operations, mechanical and electrical equipment, drainage and maintenance operations.

3.7 Highway crossings

3.7.1 Approximately 50 new highway crossings would be required, comprising road bridges, underpasses, green bridges and footbridges. In addition, widening and other modification of existing highway crossings would be required.

3.8 Highway drainage

3.8.1 South of the River Thames, the highway drainage system would discharge into vegetated drainage comprising infiltration basins with lined sediment forebays, ditches and swales. The intention is that these would outfall from the drainage systems to ground.

3.8.2 North of the River Thames, the highway drainage system would discharge into vegetated drainage comprising wetland-type retention ponds with sediment forebays, ditches and swales within an infiltration basin at the A13 junction. Existing dry retention ponds located along the M25 would be upgraded to wetland-type retention ponds with sediment forebays. The outfall from these ponds would discharge into watercourses and ditches.

3.9 Safety and security

3.9.1 The A122 would include the following:

a. Modern safety measures and design standards with technology to manage traffic and provide better information to drivers

b. Variable Message Signs to display variable speed limits, travel information, hazard warnings and both advisory and mandatory signage to drivers

c. Closed-circuit television (CCTV) cameras and detection equipment to monitor and manage network usage, for alerting and investigating incidents (e.g. stopped vehicles), for maintenance and asset protection, and for detection of crime

d. Above-ground traffic detection to control automatic traffic management systems (e.g. variable speed limits) and to collect data on traffic flows

e. Free-flow road user charging infrastructure

f. Equipment within the tunnel to monitor and control the tunnel environment during normal and emergency operations

3.10 Road user charging

3.10.1 In December 2014, the Government stated in the National Policy Statement for National Networks (NPSNN) (Department for Transport, 2014) that the '*Government will consider tolling as a means of funding new road capacity on the SRN. River and estuarial crossings will normally be funded by tolls or road user charges*'.

3.10.2 To align with NPSNN policy and to help the Project meet the Scheme Objectives, it is proposed that road user charges would be levied in line with the Dartford Crossing. Vehicles would be charged for using the new tunnel.

3.11 Walkers, cyclists and horse riders

3.11.1 Where the Project affects existing Public Rights of Way, these would be reinstated with provision of under- or overbridges, or a suitable alternative provision would be made. The Project proposes a number of new, diverted, upgraded and reinstated routes for walkers, cyclists and horse riders.

3.12 Environmental design

3.12.1 The Project has been developed to avoid or minimise significant effects on the environment, and during the design process further measures have been incorporated to mitigate adverse impacts that would arise and that cannot be avoided. Some of the measures adopted include landscaping, noise mitigation measures and the provision of green infrastructure along the Project route, including a number of green bridges. The Project would create new areas of ecological habitat, providing mitigation or compensation for the impacts on existing areas. Two new parks would be created including Tilbury Fields to the west of the North Portal, and Chalk Park south of the River Thames.

3.13 Construction compounds and Utilities Logistics Hubs

3.13.1 While the Project is being built, construction compounds would be located along the Project route. Larger compounds would be required at the North and South Portals to allow for tunnelling operations and materials management. Utilities Logistics Hubs would be needed for specific utility works.

3.14 Haulage routes and construction traffic management

3.14.1 Where there is no direct access from the SRN, suitable local roads would initially be used to access the construction worksites and compounds. Following this, temporary haul routes would be constructed off the SRN early in the programme where possible to access the construction worksites and compounds and further reduce usage of the local road network (LRN). In some instances, the temporary haul roads may need to connect to the existing LRN. Traffic management measures would be used to control the impacts of construction on the LRN and SRN.

3.15 Services and utility installations and diversions

3.15.1 To accommodate the construction and operation of the Project, it would be necessary to install and divert multiple utilities including overhead electricity powerlines, high-pressure gas pipelines and other utility networks and their associated infrastructure including cabinets, substations and maintenance compounds. New utility connections would be installed to the compounds and to the tunnels.

3.15.2 As set out in Chapter 2, the Project also includes the diversion of four elements of existing utilities infrastructure to facilitate the alignment of the A122 and its junctions that are considered to be NSIPs in their own right:

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a. Works No. G2 – National Grid Gas Pipeline Feeder 5 Phase 1 – comprises the installation of a 120m long 762mm diameter high-pressure pipeline located near Claylane Wood. The gas pipeline works are considered likely to have a significant effect on the environment for the purposes of section 20(3) of the Planning Act 2008 due to the loss of irreplaceable ancient semi-natural woodland (ASNW) and it is therefore considered an NSIP.

b. Works No. G3 – National Grid Gas Pipeline Feeder 18 – comprises the installation of an approximately 1,615m long 762mm diameter high-pressure pipeline near Claylane Wood, heading north on the western side of the Project route before passing east under the Project and Thong Lane, connecting to the existing network north of Shorne Ifield Road. The gas pipeline works are considered likely to have a significant effect on the environment for the purposes of section 20(3) of the Planning Act 2008 due to the loss of irreplaceable ASNW and it is therefore considered an NSIP.

c. Works No. G4 – National Grid Gas Pipeline Feeder 5 Phase 2 – comprises the installation of an approximately 2,676m long 762mm diameter high pressure pipeline connecting north of Claylane Wood and heading north on the western side of the Project route before passing east under the Project and Thong Lane, and then north to the A226 where the pipeline will connect to the existing utilities assets. The gas pipeline works are considered likely to have a significant effect on the environment for the purposes of section 20(3) of the Planning Act 2008 due to the impact on heritage assets and it is therefore considered an NSIP.

d. Works No. OH7 – National Grid Electricity Transmission overhead lines – comprises the diversion and modification of approximately 2,470m of 275kV overhead lines and restringing around the Project junction with the A13 /

A1089 and over the Ockendon Link. As set out in Section 1, the overhead line installation is considered to be an NSIP as none of provisions in section 16(3) of the Planning Act 2008 apply to exclude the installation of the electric line above ground.

3.15.3 The location of the four utility NSIPs are shown on Plate 3.2 and Plate 3.3.

Plate 3.2 Location of Works No. G2, G3 and G4

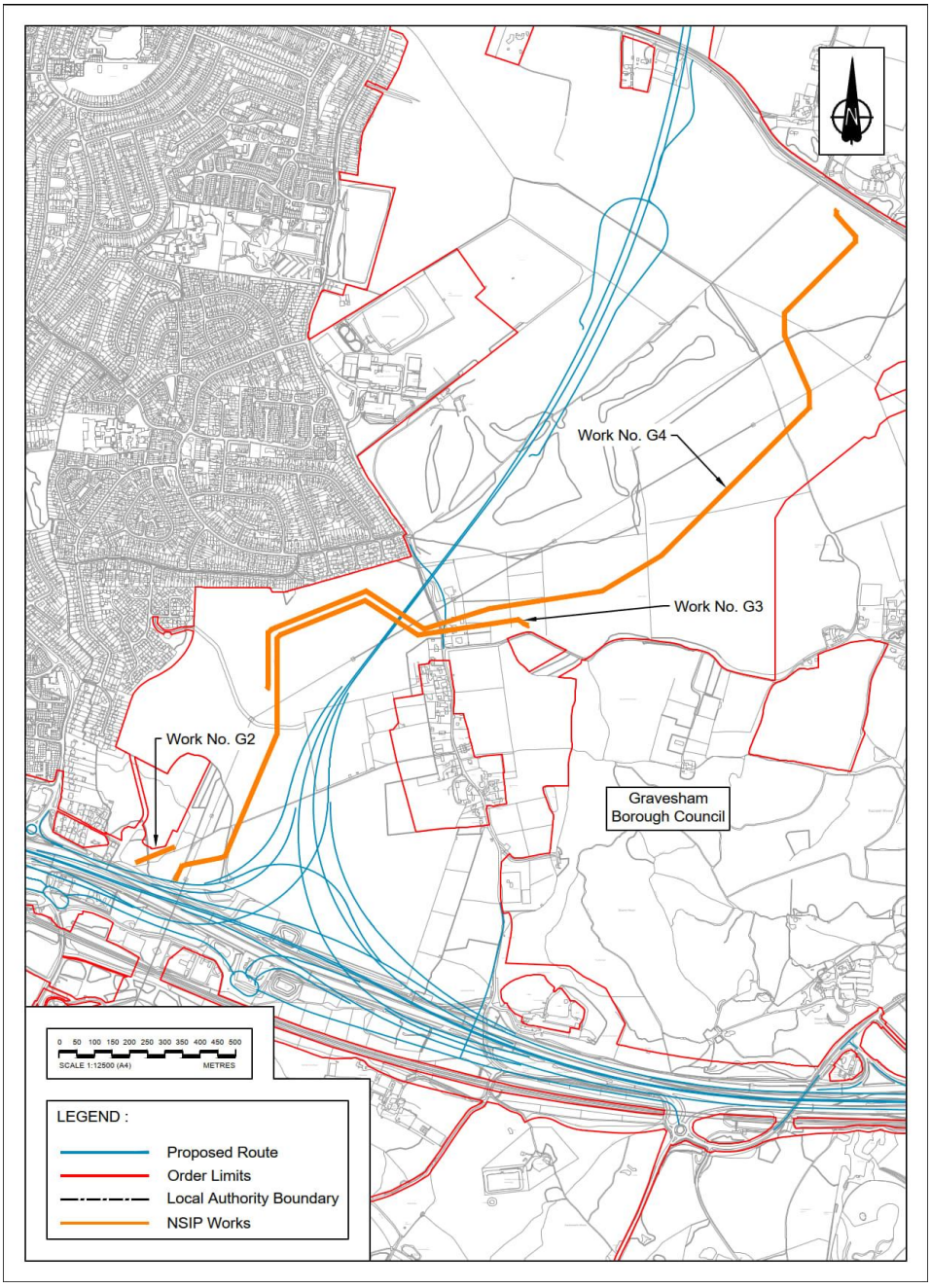
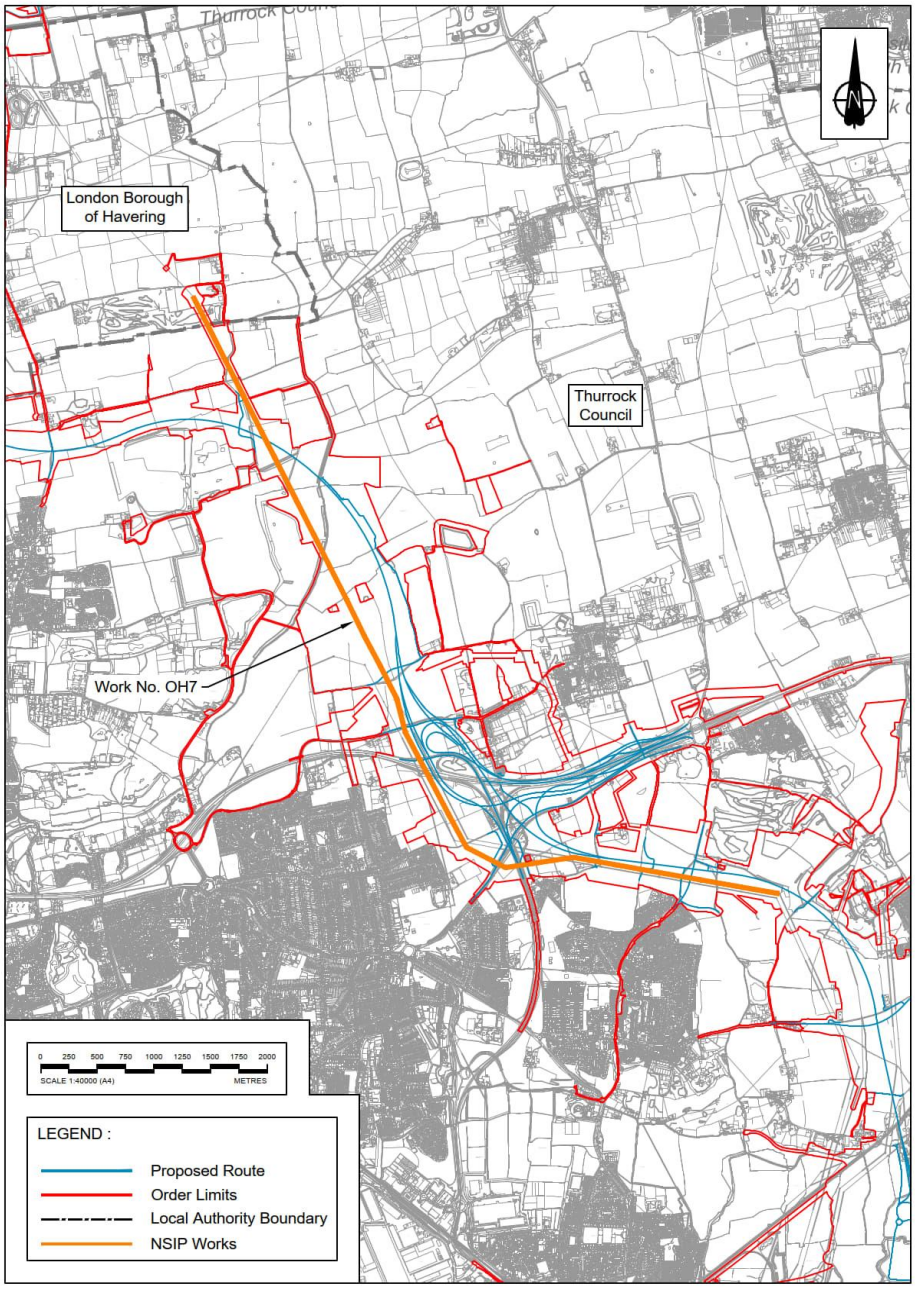


Plate 3.3 Location of Works No. OH7



3.16 Land required

3.16.1 The Project would require land on a permanent basis for the road and tunnel, along with other operational infrastructure, and environmental mitigation and compensation.

3.16.2 On a temporary basis, land would be required for construction compounds, logistics areas and other construction activities. The utility installations and diversions, some environmental works and flood compensation requirements would require land to be taken on a temporary basis, and for permanent rights to be acquired for the operation and maintenance of any utility infrastructure, and to secure environmental works and flood compensation.

3.16.3 The full land requirement for the Project is shown on the Land Plans (Application Document 2.2) and is set out in the Statement of Reasons (Application Document 4.1).

3.16.4 The Project would also require both permanent acquisition and temporary use of areas of special category land which includes common land and public open space. Replacement land would be provided for some of this special category land subject to permanent acquisition or acquisition of rights. In other cases, in accordance with the Planning Act 2008, replacement land has not been included, for example, because it is only proposed to install and divert utilities through the land and the land would not be less advantageous when subject to the rights.

3.16.5 Consultation with relevant landowners, occupiers and agents remains an ongoing focus through the development of the Project. Compensation for affected parties follows the statutory Compensation Code.

3.17 Operations and maintenance

3.17.1 Following completion, the A122 would be part of the SRN.

3.17.2 To carry out inspection plus certain specified maintenance activities in the tunnel, and emergency exercises, a periodic full closure of the relevant tunnel(s) would be required. These would be planned to minimise disruption, and where feasible, lane closures would be used instead.

3.18 Host local authorities

3.18.1 The Planning Act 2008 confers specific duties in respect of 'host' local authorities and those authorities in adjacent areas, in relation to pre-application consultation, as well as in relation to the Application and the Examination process (as set out in the Consultation Report (Application Document 5.1)).

3.18.2 The Project Order Limits include land within the following administrative areas as shown on Plate 3.1:

a. Kent County Council
b. Tonbridge and Malling Borough Council
c. Maidstone Borough Council
d. Gravesham Borough Council
e. Thurrock Council

f. Essex County Council

g. Brentwood Borough Council

h. Greater London Authority

i. London Borough of Havering

3.18.3 An assessment of the policy framework in place for each 'host' local authority and the Project's alignment and conformity is provided in Chapter 7 and Appendix C of this Planning Statement.

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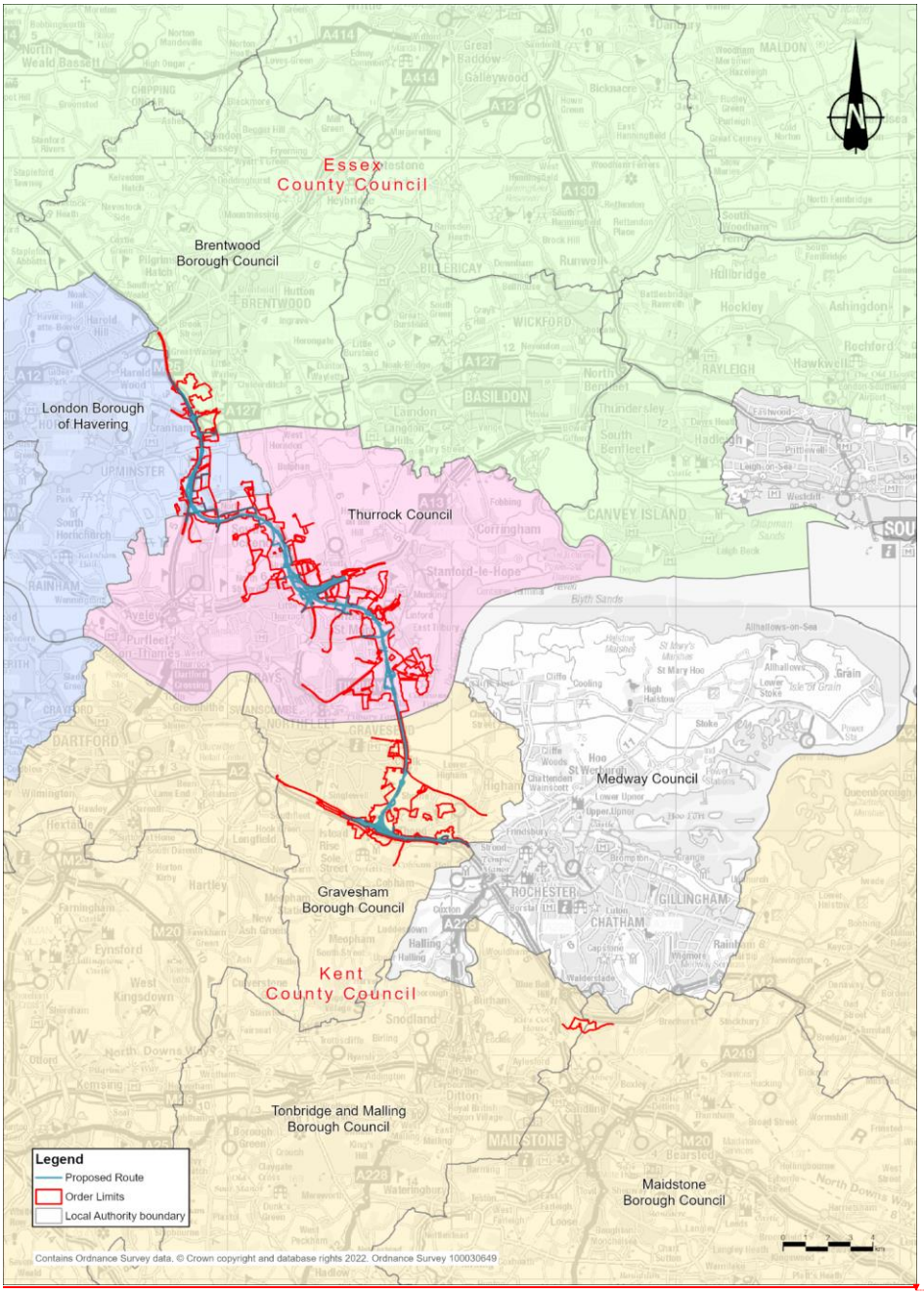
Plate 3.4 Lower Thames Crossing 'host' local authorities



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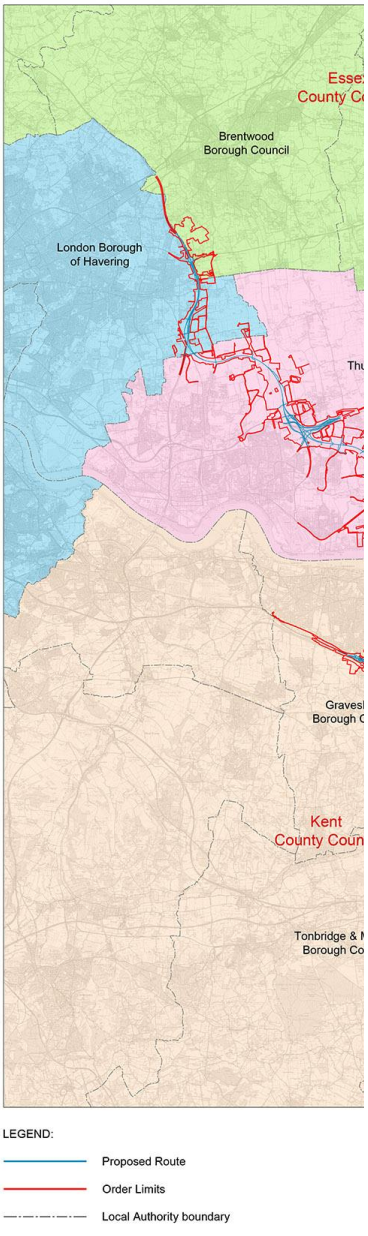


4 Needs and benefits

4.1 Introduction

4.1.1 This chapter provides a summary of the need case as presented in the Need for the Project (Application Document 7.1).

4.1.2 Section 2 of the NPSNN (Department for Transport (DfT), 2014) sets out the need for development of the national networks, the Government's policy and strategic vision and objectives. Specifically, paragraph 2.2 states that '*there is a critical need to improve the national networks to address road congestion and crowding on the railways to support safe, expeditious and resilient networks that better support social and economic activity; and to provide a transport network that is capable of stimulating and supporting economic growth'.*

4.1.3 Paragraph 2.4 recognises that the need to improve the national network is expected to intensify, stating that, '*pressure on our networks is expected to increase even further as the long term drivers for demand to travel – GDP and population – are forecast to increase substantially over coming years'*.

4.1.4 This is supported by paragraph 2.22 of the NPSNN which states that without improving the road network, including its performance, it will be difficult to support further economic development and this will impede economic growth and reduce people's quality of life. The Government has, therefore, concluded that, at a strategic level, there is a compelling need for the development of the national road network.

4.1.5 It is acknowledged that paragraph 2.24 notes that the Government's policy on development of the SRN is not that of predicting traffic growth and then providing for that growth. Individual schemes will be brought forward to tackle specific issues, including those of safety, rather than to meet unconstrained traffic growth.

4.1.6 Paragraph 2.27 of the NPSNN goes on to state that, in some cases to meet the needs of traffic, it will not be sufficient to simply expand capacity on the existing network. In those circumstances new road alignments and corresponding links, including alignments which cross a river or estuary, may be needed to support increased capacity and connectivity.

4.2 The needs case

Transport need

Demand outstrips road space supply

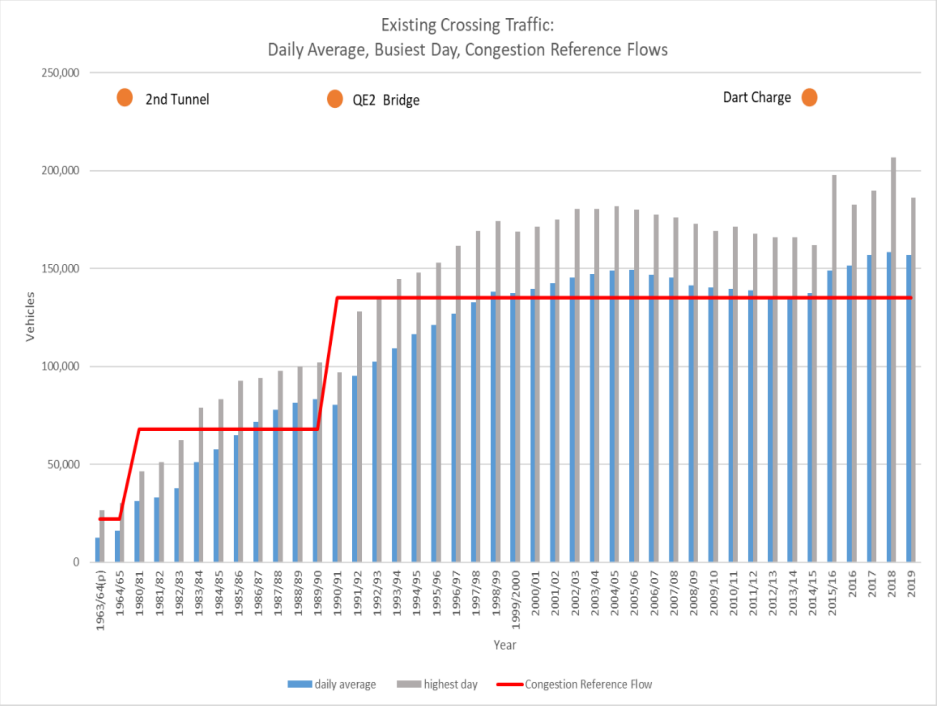
4.2.1 The fundamental transport need for the Project is because the existing traffic demand to cross the river east of London outstrips the road space supply in that location. This situation has persisted for many years as there has essentially been no major increase in the road space since the Queen Elizabeth II Bridge opened at the Dartford Crossing in 1991 despite the increasing demand.

4.2.2 The Dartford Crossing is the only significant road crossing of the River Thames east of London. The crossing consists of two bored tunnels for northbound traffic and a bridge for southbound traffic. Designed for 135,000 vehicles per

day, it carries 150,000 vehicles on a typical average day, although it regularly carries over 180,000 vehicles on the busiest days of the year (Highways England, 2019).

4.2.3 Plate 4.1 below shows how traffic has grown over time, with additional physical lane capacity at the Dartford Crossing and the implementation of the Dart Charge. There was a steady increase in traffic until 1999 when traffic began to be capacity constrained. Following the opening of the QEII Bridge, which effectively doubled capacity, it only took seven years until traffic was again capacity constrained.

Plate 4.1 Traffic using the Dartford Crossing



4.2.4 The implementation of the Dart Charge in November 2014 provided some relief on the capacity-constrained approaches; however, suppressed demand saw traffic volumes increase in the first year by four times more than the average increase on the SRN (DfT, Road Traffic Forecasts, 2018).

4.2.5 It is difficult to significantly increase the road space supply at the Dartford Crossing (e.g. widening of the road) due to its sensitive location adjacent to established settlements (i.e. need to demolish residential and commercial properties). The incremental improvement works over the years have not provided the significant road space supply that is required to meet the demand.

4.2.6 It is also difficult to reduce the traffic demand given its overwhelming strength particularly with the lack of alternative routes. For instance, traffic using the

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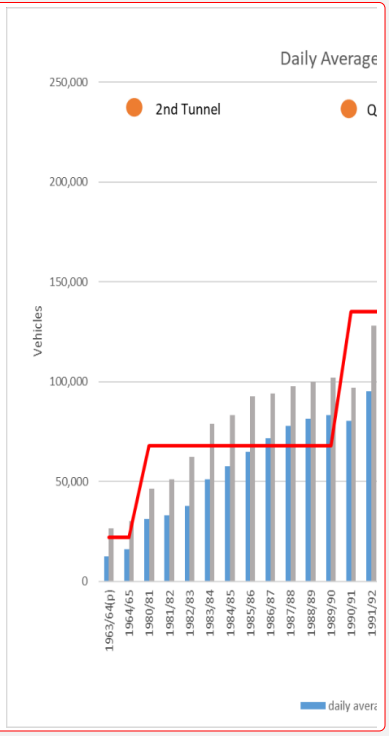

crossing increased substantially despite the introduction of the Dart Charge. Any potential closure (e.g. junction, escorted lane, etc.) is unlikely to deter road users, given the lack of an alternative route, to cross the river east of London. The Government itself acknowledges that demand management has not translated into significantly less pressure on the SRN (see paragraph 2.21 of the NPSNN).

Road space is challenged

4.2.7 While the fundamental cause of the transport problem remains that the demand outstrips supply, the problem is further exacerbated by the nature of the road space available for use. The available road space, which is already limited in its supply relative to the significant demand, is challenged by the outdated design and piecemeal improvement works carried out over the years. The incremental approach to increasing traffic capacity at the existing crossing has resulted in sub-optimal configuration with many compromises compared to modern standards.

4.2.8 The northbound tunnels have vehicle size restrictions and there are requirements to escort Dangerous Goods Vehicles (DGVs). The southbound bridge is closed for safety reasons when the forecast crosswind speed exceeds 60mph or the headwind speed exceeds 70mph. The complex road layout on the approaches to the crossing with junctions less than one mile apart north and south of the Dartford Crossing, causes issues with weaving between strategic and local traffic, rat-running of the LRN and suboptimal merge and diverge junction arrangements.

Lack of alternative routes

4.2.9 Despite the challenged road space, the road users have no choice but to continue to use the Dartford Crossing because of the lack of alternative routes. The only viable alternative for some traffic is to go around the M25 to the west of London, significantly increasing their journey time and distance. Vehicles heading for the north of England via the M1 for example would have to travel nearly double the distance (i.e., 45 miles anti-clockwise increasing to 80 miles clockwise).

Road user issues

4.2.10 The combination of the significant demand outstripping road space supply, the challenged road space and the lack of alternative routes manifest several road user issues associated with the Dartford Crossing.

4.2.11 The existing crossing experiences high levels of traffic with typical daily traffic flows of 157,000 vehicles in 2019 (Highways England, 2019) compared to the original design capacity of 135,000 vehicles. Traffic flows fluctuate relatively little during the year and there is little variation in flow between weekdays, although weekends experience slightly lower flows. The existing crossing operated above its design capacity on 337 days during 2019 (Highways England, 2019). Traffic flows above the design capacity of a road result in significant congestion making the Dartford Crossing an unreliable section of the SRN. Photographs in Plate 4.2 show examples of congestion at the Dartford Crossing.

Plate 4.2 Photographs of congestion at the Dartford Crossing

4.2.12 The average daily traffic flow using the Dartford Crossing without the Lower Thames Crossing is predicted to increase by nearly 21% in the period 2016-2030. This would lead to increased congestion at the Dartford Crossing, on key approach roads such as the A2, M20, A13 and the A127, and on the LRN in Dartford and Thurrock. Local people's daily routines are impacted, leading to wasted time for people and industry and affecting economic productivity. Major improvements would be needed to provide a long-term solution.

4.2.13 The congestion and delays arising from high volumes of traffic at the Dartford Crossing are made worse when incidents occur. In 2019 the average duration of incidents at the Dartford Crossing was approximately 10 minutes. There are, on average, 10 lane closures each day (in addition to those required for DGV escorts), which impact traffic flows at Dartford Crossing for, on average, over 1.5 hours per day (Highways England, 2019).

4.2.14 Due to the Dartford Crossing frequently operating above capacity, closure in either direction, even for a relatively short time, can lead to significant additional congestion. Traffic congestion of this magnitude results in thousands of lost hours for drivers.

4.2.15 Furthermore, when larger incidents occur during daytime hours, the lack of available capacity means that it can take until the late evening for the Dartford Crossing to return to normal journey times (National Highways data, 2019). During these incidents, journeys on all roads surrounding the crossing are severely disrupted and slow-moving traffic can extend back as far as M25 junction 4 (over nine miles) in the case of a northbound incident, and M25 junction 29 (over seven miles) with a southbound incident (National Highways data, 2019). This poor level of resilience at the Dartford Crossing is further undermined by a lack of alternative routes across the river, leading to substantial delays to users, often causing 'gridlock' on both the surrounding strategic and local highway networks. The safety record on most of the sections of the M25/A282 in the vicinity of the Dartford Crossing is worse than the national average for roads of a similar classification due in part to the high number of incidents at the Dartford Crossing and its approaches (further information on this is contained in the Combined Modelling and Appraisal Report (Application Document 7.7).

4.2.16 Under free-flow conditions, the journey time on the M25 between junction 2 and junction 30 should take about 4 minutes and 30 seconds, taking into account the 50mph speed limit through the Dartford Crossing. However, during peak periods, northbound speeds can drop as low as 10mph on the Dartford Crossing approaches (Teletrac data, 2014) which results in journey times doubling over the same section.

4.2.17 Drivers using the Dartford Crossing can experience variations in their journey times of up to nine minutes, depending on volume of traffic (Teletrac data, 2014). In addition, the impact of incidents creates a further, potentially significant variable affecting journey times over the Dartford Crossing.

4.2.18 Historically, traffic levels at the Dartford Crossing were highest in the morning and evening peak periods, with the interpeak period providing an opportunity for the crossing to recover from traffic backlogs or incidents in the morning peak. However, in recent years, due to peak period congestion, interpeak traffic flows have been increasing and the ability of the interpeak to offer a recovery period has been reducing with knock-on consequences for the afternoon peak. Without the Project, this trend is expected to continue and any recovery period would eventually disappear, exacerbating the existing high levels of congestion. This is likely to lead to an increase in occurrence of the situation where traffic fails to recover from an incident during the morning or the inter-peak period, resulting in the evening peak starting with a high level of congestion already in place.

Business transport

4.2.19 Approximately 18% of the total daily traffic using the Dartford Crossing in 2016 was Heavy Goods Vehicles (HGVs). This is almost double the percentage typically observed on other parts of the SRN, demonstrating the relatively significant business users' reliance on the Dartford Crossing and the

importance of the crossing for facilitating the movement of goods from Continental Europe.

Community and environment need

4.2.20 Considering the levels of traffic congestion on the Dartford Crossing, and a lack of viable alternatives to cross the Thames Estuary in the surrounding area, it has been difficult to build strong connections between communities in Kent, Thurrock and Essex.

4.2.21 Journeys that use the Dartford Crossing during peak periods in the 2016 base year as forecast by the Lower Thames Area Model (LTAM) show that up to 19% of trips start or finish in the local area. Only 4% are local to local trips and almost 50% of trips have an origin or destination in the wider Kent or Essex region. It shows that 96% of trips have an origin or destination outside the local areas immediately either side of the Dartford Crossing. This demonstrates that the Dartford Crossing has a significant role in providing regional and national connectivity, but also highlights the effects of the poor journey time reliability and resilience on motorists from the local areas, which suppress the local demand to use the crossing. The local trips, such as taking children to school or visiting friends and family are important to quality of life and have significant community and social values.

4.2.22 The challenges at Dartford Crossing, including lack of journey time reliability and congestion, can lead to journeys that can be frustrating and stressful, and that can limit road user opportunities to access employment, education and leisure facilities, even if they are in close proximity.

4.2.23 For those that need to use the Dartford Crossing for business trips the existing issues result in longer commuting times, either through longer journey times in themselves or by building in additional time as a result of journey variability to ensure they reach their destination at the time originally intended. This in turn leads to a drop in productivity and can lead businesses to limit their operations to one side of the River Thames, which would in turn further reinforce the social and community separation of the local settlements north and south of the river.

4.2.24 The Project's traffic model forecasts that vehicle numbers on the Dartford Crossing would increase by 21% in the period 2016 – 2030. This means that queuing on the approaches to the Dartford Crossing, both on the SRN and the LRN, during peak hours would increase. The Dartford area, which is already under severe traffic pressure, would be the most affected with heavy traffic extending beyond current peak hours.

4.2.25 Congestion causes high levels of emissions and poor air quality. When congestion and closures occur at the Dartford Crossing, the quality of the environment is heavily impacted by the queuing traffic with local communities being exposed to high levels of air pollution and noise. In line with the traffic forecasts, these environmental issues are expected to increase without the Project.

Economic need

4.2.26 The Dartford Crossing, the only road crossing of the River Thames east of London, is a critical part of the country's road network and is a critical component in the UK's economic infrastructure. It connects local and regional

businesses and provides a vital link between the Channel Ports, London and the rest of the UK. However, the congested nature of the Dartford Crossing means that there is an economic need for an additional crossing. The economic need for the Project should be read in conjunction with the transport need presented earlier and comprises additional needs beyond those presented in the transport section.

4.2.27 The Lower Thames area's economy has several strengths including its proximity to London, port infrastructure and location on the nation's key internal trade route. However, the severance caused by the River Thames and congestion at the Dartford Crossing have combined with other factors, such as low educational attainment and skill levels as well as pockets of deprivation, to damage the area's overall competitiveness.

4.2.28 The poor transport connectivity across the River Thames affects labour markets by reducing the development of new clusters in emerging sectors of the economy, and the ability of the population to find work and local employers to attract a skilled workforce.

4.2.29 As a result, the economies to the north and south of the river have developed separately, duplicating many economic activities, particularly those in the service sector. This has stifled competition, deterred investment, particularly by high tech/high value industries, and reduced the growth in job creation. All of this has negatively impacted the economic performance of the area.

4.2.30 The River Thames acts as a barrier between Kent, Thurrock and Essex and other parts of the South East economy, which also encompasses East Sussex, Medway and Southend. The region suffers from low business productivity and this is exacerbated by the congestion at the Dartford Crossing.

4.2.31 There is good evidence that businesses are more productive when they are clustered together and located close to similar businesses. This is known as agglomeration benefits. The congestion at the Dartford Crossing effectively separates businesses on each side of the river and reduces their productivity.

4.2.32 The Lower Thames area plays an important role in supporting London's economy and productivity. The area provides opportunities for people to live and for businesses to locate that are more affordable than central London but still close to it. The comparatively lower land values mean that Kent and Essex have an important function accommodating businesses with a larger land requirement, or other requirements (such as bad neighbour uses), that mean that they cannot easily be located in central London. This function as 'London's workshop' is particularly relevant and important for heavy industry, transport and storage, and construction industries. For the area to continue to serve London's economy and productivity in a way that is economically and environmentally sustainable, the two economies on either side of the River Thames must be better connected.

4.2.33 The Dartford Crossing is a strategic link between the UK and Europe, enabling goods and people to flow between the Channel Ports and the UK's industrial heartlands and beyond. Businesses across the country require good connectivity to access markets, suppliers and the labour market. The major international ports in Kent and Essex and Thurrock, including the Port of Dover, Port of London Medway, Port of Tilbury and DP World London Gateway Port, are heavily dependent on the SRN at or near the Dartford Crossing. Moreover,

the Channel Tunnel gateway plays an important complementary role in trade with the EU and contributes to HGV and LGV traffic in the region.

4.2.34 The lack of capacity across the River Thames and the congestion at the Dartford Crossing threaten to weaken the UK's international competitiveness, increasingly disrupt trade flows, stifle employment growth and hamper efforts to raise national productivity levels. In this regard there is a clear economic need for the Project.

Setting the Scheme Objectives

4.2.35 The need, as set out above, formed the basis for identification of the Scheme Objectives as shown in Table 4.1. The objectives, which comprise three principal categories of Transport, Community and Environment, and Economic, were developed by the Applicant and endorsed by the DfT, after the Government commissioned the Applicant to identify and assess options for a new road crossing in the Lower Thames area in 2014. The approach to considering route options is presented in Chapter 5 of this Planning Statement.

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Table 4.1 Scheme Objectives

Scheme Objectives	
Transport	• To relieve the congested Dartford Crossing and approach roads and improve their performance by providing free-flowing north-south capacity • To improve the resilience of the Thames crossings and the major road network • To improve safety
Community and environment	• To minimise adverse impacts on health and the environment
Economic	• To support sustainable local development and regional economic growth in the medium to long term • To be affordable to government and users • To achieve value for money

4.3 Project benefits

Transport benefits

Increased road space supply

4.3.1 The Project would provide over 80% additional road capacity across the River Thames east of London and reduce traffic flows on the Dartford Crossing by 19% in 2030 (opening year).

4.3.2 This additional road capacity would help to address the fundamental transport need of the Project which is to increase the road space supply to serve the existing traffic demand wishing to cross the river east of London.

4.3.3 To fully realise the benefits of significantly increasing the road space supply, the Project would be designed and built to the latest standards and to the highest quality without the useability of the road space being challenged.

4.3.4 The Project would not suffer from weather or vehicular limitations associated with the Dartford Crossing. For example, the crossing would be underground and weather resilient. The size of the proposed tunnel bore has enough headroom to accommodate all vehicles capable of using the normal road network, and therefore there would be no need for escorting or re-routing certain vehicles, and the need for HGVs to take a significant detour the other way around the M25 would be removed. There would be no substandard junctions nearby and the tunnels would incorporate emergency service and access requirements.

4.3.5 The new road space would be properly planned holistically and its useability would not suffer from sub-optimal configurations or piecemeal and incremental works.

Alternative crossing

4.3.6 The Project would provide an alternative route east of the Dartford Crossing for local, regional and national traffic, providing choice for road users and an alternative in the case of incidents or closures at the other River Thames crossings, for increased network resilience.

Road user improvements

4.3.7 The combination of the increased road space supply and the provision of an alternative route to the Dartford Crossing would deliver a wide range of road user improvements for those wishing to cross the river east of London.

4.3.8 The Project has been designed to provide a free-flow connection between the A2 and M25 with a design speed of 70mph. This includes free-flow junctions at both ends as well as free-flow user charging facilities, as is the case at the Dartford Crossing.

4.3.9 A significant proportion of traffic that currently crosses the River Thames using the Dartford Crossing would use the shorter Project route instead. The LTAM predicts that the overall level of traffic using the Dartford Crossing would fall by 19% in the opening year (2030), when compared to the situation without the Project. Traffic would also reduce on key roads in the Lower Thames area, including the A13 and A2, west of their junctions with the Project.

4.3.10 The Project would provide a less congested, quicker, more reliable alternative for those wishing to cross the River Thames east of London and, by taking traffic from the existing Dartford Crossing, would release capacity there for local traffic.

4.3.11 Journey time comparisons have been produced along key strategic corridors both with and without the Project. These show that, with the Project, in 2030 and 2045, there would be substantial decreases in journey time on the Dartford Crossing corridor between M25 junction 29 and M25 junction 2 in both directions. There would also be significant journey time savings on the A2 between the M2/A2/A122 Lower Thames Crossing junction and M25 junction 2 and, on the A13 between the A13/A1089/A122 Lower Thames Crossing junction and M25 junction 30. There are however some forecast increases in journey times on the A2 and A13, east of their junctions with the Project, and on the wider M25 both north and south of the river, although the benefits of the decreased journey time elsewhere would outweigh these impacts overall.

4.3.12 It is predicted that average traffic speeds on the road network would rise and journey times would become more reliable through reduced incident delays, diversion impacts and journey time variability, as presented in the Combined Modelling and Appraisal Report (Application Document 7.7).

4.3.13 While there would be a reduction in congestion at the Dartford Crossing and other key roads in the Lower Thames area as a result of the Project, it is acknowledged that there may be adverse changes in congestion in the road network away from the Project. This is due to changes in traffic flow at particular junctions and along particular roads across the SRN and Primary Route Network, during both the construction and operational phases. As presented in Appendix D: Economic Appraisal Package of the Combined Modelling and Appraisal Report (Application Document 7.7), the reduction in congestion across the road network significantly outweighs the identified impacts overall. The Wider Network Impacts Management and Monitoring Plan (Application Document 7.12) sets out a framework which commits to working with relevant authorities and the DfT to monitor impacts and where appropriate, seek funding for interventions on the wider network at a future date.

4.3.14 While a small increase in collision numbers as a result of more traffic in the study area is forecast, there would be a reduction in the collision rate (i.e., collisions per vehicle mile travelled) as a result of a managed, less congested network. This is further detailed in Appendix D (Economic Appraisal Report) of the Combined Modelling and Appraisal Report (Application Document 7.7).

Business transport

4.3.15 The Project is predicted to reduce the HGV usage of the Dartford Crossing by around 34% in 2030 (opening year) due to it being an attractive (e.g. shorter and quicker) route for vehicles travelling to and from the ports to better serve the high demand for HGV crossings in the Lower Thames area. Approximately 13% of the vehicles using the Project in 2030 (opening year) are predicted to be HGVs which is greater than is typically observed on other parts of the SRN. It would also provide HGVs with more safe and more free-flowing journeys than the Dartford Crossing, to aid businesses. Therefore, the Project would be significantly beneficial to the business transport users wishing to cross the River Thames east of London.

Community and environmental benefits and opportunities

4.3.16 The additional connectivity offered by the Project would improve the ability for local traffic to cross the River Thames for leisure and non-business purposes, e.g. seeing friends and family the other side of the river. The Project would also enable the local traffic to make more use of the less congested Dartford Crossing by improving the journey time reliability which improves the crossing's user experience.

4.3.17 The Project also incorporates provision of routes for walkers, cyclists and horse riders, designed to improve accessibility to the existing network, to maximise access for users (including those with limited mobility) while considering and mitigating potential impacts from misuse and antisocial behaviour through good design.

4.3.18 Examples of upgraded active transport connections include approximately 22km of improved walking, cycling and horse-riding routes as well as approximately 40km of new walking, cycling and horse-riding routes. In total, these new or upgraded active transport connections total over 62km, almost three times the length of the Project's main carriageway.

4.3.19 An active mode appraisal has been undertaken as part of Appendix D of the Combined Modelling and Appraisal Report (ComMA) (Application Document 7.7) which considers the impacts of the Project on physical activity levels for new active travel mode users. The new active mode users will gain health benefits from a decrease in their mortality rate.

4.3.20 National Highways has committed as part of the Road Investment Strategy 2 (RIS 2) to achieving no net loss in biodiversity by the end of RIS 2 and will work towards biodiversity net gain by 2040 across its estate. The Project design has sought to increase biodiversity value wherever possible within its landscape design.

4.3.21 The Project would leave a positive legacy of green infrastructure with significant new recreational sites such as Tilbury Fields and Chalk Park while also mitigating its impact on existing green infrastructure.

4.3.22 Air quality at the Dartford Crossing is heavily impacted by road traffic emissions, with local communities being exposed to high levels of air pollution exceeding Air Quality Strategy (AQS) objectives. In a 'without Project' scenario, it is predicted that nine receptors along the A282 Dartford Crossing corridor would exceed the annual mean NO_2 AQS objectives (see ES Chapter 5: Air Quality (Application Document 6.1)).

4.3.23 The Project is predicted to result in a reduction in traffic flow at the Dartford Crossing of 19% in the opening year (2030) which leads to an improvement in annual mean NO_2 at these nine receptors. The air quality improvements at the Dartford Crossing, resulting from the Project, mean that all nine of these receptors would no longer exceed the annual mean NO_2 AQS objective.

4.3.24 While overall there would be more receptors (16) predicted to experience improvements in air quality as a result of the Project, there are a number of receptors located on the A228 and M2 which would experience a deterioration in air quality exceeding the AQS Objectives.

4.3.25 Notwithstanding, overall, the impact of the Project on air quality is not considered to be significant at human receptors and the Project is not predicted to affect the UK's reported ability to comply with the Air Quality Directive (2008/50/EC) in relation to achievement of limit values. Air quality assessments for the Project are contained within ES Chapter 5: Air Quality (Application Document 6.1).

4.3.26 The Project is predicted to result in significant beneficial noise effects for the communities along the M25 from junction 28 through the Dartford Crossing to junction 2 for example, as traffic is predicted to divert away from the Dartford Crossing to the Project (see ES Chapter 12: Noise and Vibration (Application Document 6.1)).

4.3.27 While there would be other receptors which are predicted to be exposed to increased noise, the Project would minimise operational noise by keeping the

road as low in the landscape as practicable, which means that road surface noise is more effectively attenuated than on a more conventional elevated highway. Acoustic barriers have also been included and a low noise/thin surfacing system would be used across the new and altered trunk roads comprising the Project to minimise the tyre-induced traffic noise.

4.3.28 Additionally, the Project would benefit the local community through provision of jobs during the construction phase, while also increasing the skill base of local residents working on the Project to benefit them post-construction. The Project would have a target of at least 45% of employees to be from within 20 miles of the Project which is provided through the Skills, Education and Employment Strategy which is secured through the Stakeholder Actions and Commitments Register [Document **Reference** 7.**21 (7)**].

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Economic benefits

4.3.29 The Project would help relieve traffic congestion on both sides of the River Thames east of London, particularly around the Dartford Crossing. Firms would be able to get their goods to market more quickly and reliably and benefit from lower costs.

4.3.30 The Project would also boost business productivity and open up opportunities for local economic growth. The enhanced connectivity would enable businesses to benefit from knowledge and technology synergies and deeper business and labour markets, which would help strengthen local skills. The Project would also provide scope for delivering more transformational benefits for the local economy by unlocking cross-river trading opportunities that would strengthen competition and enhance business productivity. Firms would have a greater incentive and ability to relocate and/or reorganise their business operations in order to expand their supply chains and sales areas. This would enable them to create more jobs and recruit from a much wider labour market pool and raise investment levels.

4.3.31 With greater certainty of journey times and commuting costs in the Lower Thames area, firms and workers would both be more willing to look further afield for business and employment opportunities across the river. For example, reductions in commuting journey time and cost would increase the available labour supply and the propensity of employers to hire people who live on the 'other side of the Thames'. These changes are likely to encourage the development of a large and more competitive single market in the Lower Thames area, spanning both sides of the river.

4.3.32 While benefits would be greatest for local businesses in high value economic sectors, they would also be significant for firms in the lower value transport and construction sectors given their high transport costs and relative concentration in the Lower Thames area.

4.3.33 These gains would feed through supply chains to businesses in other economic sectors, encouraging new business clusters to develop. This would raise employment growth and boost inward investment, which would enhance the competitive performance and development of the local area.

4.3.34 The Project would support business growth across the South East region including London. The River Thames currently separates the two economies on

either side of it preventing a more holistic, South East regional economic growth. These economies also perform important but largely separate roles in serving London. They each provide a more affordable location for the workforce to live and for businesses with larger land or other requirements to locate.

4.3.35 Connecting two separate but similarly performing places, is inherently efficient economically. It means:

a. Business trips are quicker and easier

b. Duplication of land use is reduced, for example, one distribution centre can replace two (that were previously either side of the river)

c. Businesses have more competition, making them more efficient

d. Businesses have a larger pool of talent to recruit from, resulting in better job matching

4.3.36 In addition to the transport user benefits, there are benefits of businesses being better connected to each other, known as agglomeration. It explains why businesses will pay higher rents to be in the centre of cities: the benefits of technology and innovation spillovers; and the benefits of being close to other businesses to trade with.

4.3.37 Transport schemes increase agglomeration because they change the effective density of places. By making it easier to move between two economies (such as Kent and Essex), transport schemes can have significant effects on the productivity of businesses.

4.3.38 Over 80% of the total agglomeration benefits of the Project would occur within the South East Local Enterprise Partnership (SELEP) region and over half (51%) are within the six Lower Thames local authorities. In fact, Medway benefits from over a fifth (23%) of the total agglomeration benefits arising from the Project. There are also benefits to the regional economy of increased competition and labour supply impacts For a more detailed breakdown by Local Authority areas refer to the ComMA Appendix D (Application Document 7.7).

4.3.39 A greater degree of holistic regional growth across both sides of the River Thames would also support London's economy with greater efficiency by providing more affordable spaces for people to live and businesses to locate.

4.3.40 As the Project would be located on the key internal trade route between the Channel Ports and the Midlands and North of England, it would have a vital role in facilitating the flow of goods and labour, contributing to raising national productivity levels and boosting the growth of the national economy, supporting Government objectives around Global Britain.

4.3.41 The Project would provide important journey time and distance savings for freight traffic. It is forecast that, in 2030 post Project opening, HGV flows on the Dartford Crossing would reduce by 34% across the day illustrating the significant volume of HGVs switching to the Project route.

4.3.42 Additionally, the Project would benefit freight users in relation to journey time reliability, and particularly the perception of reliability, in the transport and logistics sector. Reliability for freight traffic is known to be undervalued in

standard transport appraisal approaches but is a particular issue for hauliers who have to deliver to tight delivery slots or meet booked ferry sailings.

4.3.43 The Project would also have significant benefits for traffic travelling to or from the major ports in the Lower Thames area and ports further afield such as those elsewhere in Kent. North of the River Thames, the Project would enable Tilbury and London Gateway ports and the Thames Freeport to continue their rapid growth. The Project would be equally important for ports to the south of the River Thames. The Kent ports plus the Channel Tunnel handle 45% of English roll on/roll off volume in tonnes. In terms of the number of vehicles, 6.8 million trucks travelled to or from them for roll on/roll off services in 2018. Notably, Dover and the Channel Tunnel carry 71% of accompanied road freight vehicles to and from the UK.

4.3.44 While the Project is strategically important for both the freight and ports sectors, supply chain linkages mean that the benefits for these sectors would be transferred to, and experienced by, a much wider range of other sectors within the UK economy.

4.4 Supporting the Scheme Objectives

4.4.1 Table 4.2 provides a summary of how the key benefits of the Project support the Scheme Objectives. The benefits of the Project are such that it is the right solution to the issues identified and the Project would support the Scheme Objectives.

Table 4.2 How the Project supports the Scheme Objectives

What the Project would achieve	
Transport	The Project would provide additional road capacity and river crossing east of London, significantly improving road space supply to serve the traffic demand.
	The additional road space would not be challenged by design limitations (e.g. no sub-optimal junction layout, no need for escorting, no wind-related concerns, etc.).
	An additional crossing would provide an alternative crossing option across the river east of London and a more resilient road network in the Lower Thames area.
	The Project would significantly reduce traffic congestion at the Dartford Crossing.
	Many journeys on both sides of the river, as well as those that cross the river, would be quicker.
	The Project would follow the latest safety standards and would decrease the accident rate.
	Cross-river journey time reliability would be improved, with fewer delays and less uncertainty.
	The Project would be significantly beneficial to the business transport users wishing to cross the River Thames east of London.

What the Project would achieve	
Communities and environment	Improved cross-river and local trips between communities by way of an additional crossing and less congested Dartford Crossing.
	Enhanced connectivity and facilities for walkers, cyclists and horse riders.
	Reduced congestion in the Dartford area would decrease noise and air pollution.
	The Project would leave a positive legacy of green infrastructure and improved biodiversity.
	Improved access to local jobs and upskilling opportunities for local communities.
Economic	Faster and more reliable journeys and improved accessibility would boost the productivity of businesses in the Lower Thames area and wider region.
	Enhanced connectivity and cross-river economic opportunities would further stimulate competition, boosting employment and increasing inward investment locally and regionally.
	Benefits would be greatest for high value businesses, but also significant for the local area's lower value transport and construction sectors.
	Quicker, more reliable access to key markets, resources and labour for the region's ports.
	The Project would provide value for money.

4.4.2 In addition to the benefits directly secured through the Project, the Applicant has prepared an additional commentary articulating the additional outcomes delivered as a result of their strategic and local activities. These can be found in the Benefits and Outcomes Document (Application Document 7.20).

4.5 Conclusion

4.5.1 The NPSNN and other relevant policy context, as presented in the Need for the Project (Application Document 7.1), provide strong and clear support for delivering national networks that meet the UK's long-term needs. In addition, there is a need for the Project to deal with long-standing transportation, community and environmental, and economic issues caused by the lack of alternatives to the Dartford crossing in the south-east of England.

4.5.2 Fundamentally, the road traffic demand wishing to cross the River Thames east of London significantly outstrips the road space supply in that location. The road space is also challenged by outdated design and piecemeal improvement works exacerbated by vehicle restrictions and sub-optimal configurations. Despite the challenged road space, the road users have no choice but to continue to use the Dartford Crossing because of the lack of alternative routes.

4.5.3 The current challenges at the Dartford Crossing have significant negative impacts on both road users and non-users in terms of road traffic, economic productivity and trade, affected local communities and user experience and environmental impacts.

4.5.4 Congestion and incidents at the Dartford Crossing cause slow and unreliable journeys for a high number of vehicles for long periods every day. This has severe and significant economic, safety and socioenvironmental impacts for

road users and local communities. Accordingly, there is a demonstrable need for the Project and the provision of the proposed solution is in the public interest.

4.5.5 The Project is expected to have transformational and significant positive impacts on the future growth potential of the national and regional economies and the prosperity of the local population, now and in the future. Without additional road capacity, the transport, economic and environmental problems would continue to worsen over time.

4.5.6 The consequences of not proceeding with a new crossing are as follows:

a. Congestion and delays would likely worsen both at the Dartford Crossing and on the LRN – journey times would increase and journeys would be less reliable.

b. National, regional and local productivity and economic growth would be constrained and the cost of moving freight by road would increase.

c. Growth potential for ports in the Lower Thames area would be limited, frustrating the Government's growth ambitions such as the Thames Freeport and emerging Investment Zones.

d. Further deterioration of safety on the roads close to the Dartford Crossing.

e. Increases in road traffic, congestion, noise and vehicle emissions in an area where acceptable levels are already exceeded.

4.5.7 The Project would significantly contribute to resolving these issues, delivering benefits across a wide range of needs and opportunities. This demonstrates a clear and compelling need for the Project.

4.5.8 The Project would substantially increase the road space supply and provide more reliable journeys across the River Thames. The enhanced connectivity would provide increased cross-river economic opportunities which would stimulate competition and boost employment in the region. It would also allow for quicker, more reliable access to key markets, resources and labour for the region's ports.

4.5.9 The Project would result in enhanced connectivity and facilities for walkers, cyclists and horse riders, alongside improved access to communities and businesses. Additionally, reduced congestion in the Dartford area would also decrease air pollution and noise effects for this community.

4.5.10 As a result of the Project, many journeys on both sides of the river, as well as those that cross the river, would be quicker and would be subject to fewer delays and less uncertainty than at present. Congestion at the Dartford Crossing would be significantly reduced as the Project would provide substantial additional capacity and a new route option across the River Thames.

4.5.11 The benefits of the Project set out above, and the Need for the Project (Application Document 7.1), are also considered against relevant planning policies within this Planning Statement. For the reasons set out above it is considered there is a clear and overriding need for the Project in the public interest.

5 Project evolution and alternatives

5.1 Introduction

5.1.1 This chapter outlines the process that has been followed to identify and assess potential options and alternatives for the delivery of the Lower Thames Crossing, from initial government studies exploring ways to address the capacity constraints at the Dartford Crossing, through the various stages of consultation to the final scheme proposals (as summarised in Chapter 3 of this document).

5.1.2 The purpose of the chapter is to provide a narrative on the evolution of the Project but it is also complemented by:

a. ES Chapter 3: Assessment of Reasonable Alternatives (Application Document 6.1), which addresses the particular requirements of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 in relation to alternatives for the purposes of environmental assessment.

b. Part G of the Project Design Report (Application Document 7.4) which provides greater details on various aspects of design evolution.

c. The Consultation Report (Application Document 5.1) which explains how development of the Project has been specifically influenced by responses to consultation on the Project.

d. Chapter 5 of the Statement of Reasons (Application Document 4.1) which presents the approach to project design and alternatives in the context of the case for compulsory acquisition.

5.1.3 This chapter is structured as follows:

a. **Section 5.2 Policy Context** provides an overview of the relevant policy relating to the consideration of alternatives against which the Project has been assessed.

b. **Section 5.3 Assessment of alternative modes of transport** describes the project selection process undertaken to confirm the need for a road crossing to address the identified capacity constraints at the Dartford Crossing, having regard to alternative modes of transport.

c. **Section 5.4 Route selection** describes the subsequent route selection process for a road crossing setting out the key stages undertaken as options were identified and assessed for their technical feasibility and environmental acceptability leading up to the Government's Preferred Route Announcement and subsequent reappraisal and backchecking undertaken by National Highways to confirm that the chosen route represents the most appropriate option for delivering the Scheme Objectives and associated benefits while balancing potential environmental impacts.

d. **Section 5.5 Design refinement and evolution** provides a summary of further design refinements and evolution to the Project based on the preferred route.

e. **Section 5.6 Utilities diversions** addresses the approach to considering alternative options for the necessary utilities diversions required to deliver the Project as well as for the proposed location of Utility Logistics Hubs (ULHs) required for utility works to be completed.

f. **Section 5.7 Construction compounds** describes the principles of site selection for the temporary construction compounds located along the proposed Project route.

g. 5.8 **Summary** provides a short summary and conclusion on NPS policy compliance.

5.2 Policy Context

5.2.1 As introduced in Chapter 2 of this document, the NPSNN has effect in relation to the highways nationally significant infrastructure project proposed and provides the primary policy basis for those elements, including policy in relation to alternatives. Section 4.4 of NPS EN-1 also includes requirements relating to alternatives, which are relevant to the energy NSIPs, and is also referred to below.

5.2.2 NPSNN paragraph 3.3 provides broad overarching context in relation to scheme development and states that:

'Applicants should also provide evidence that they have considered reasonable opportunities to deliver environmental and social benefits as part of schemes'.

5.2.3 These two component parts of sustainable development, along with economic considerations in meeting the Scheme Objectives, have influenced the design of the Project, both through its development and in its responses to stakeholder engagement and public consultation.

5.2.4 Paragraph 4.11 of the NPSNN also specifically recognises the characteristics of linear infrastructure. It states that:

a. 'This NPS deals predominantly with linear infrastructure – road and rail development. These differ from some of the other types of infrastructure covered by the Planning Act for several reasons:

b. These networks are designed to link together separate points. Consequently, benefits are heavily dependent on both the location of the network and the improvement to it.

c. Linear infrastructure is connected to a wider network, and any impacts from the development will have an effect on pre-existing sections of the network.

d. Improvements to infrastructure are often connected to pre-existing sections of the network. Where relevant, this may minimise the total impact of development, but may place some limits on the opportunity for alternatives'.

5.2.5 It is, therefore, recognised in Government policy that options for linear infrastructure will be influenced, and potentially limited, by the nature and location of improvement required to the existing network.

5.2.6 The NPSNN then includes a specific section on 'alternatives' as one of the Assessment Principles in Chapter 4, setting out policy in two paragraphs (4.26 and 4.27).

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5.2.7 Firstly, paragraph 4.26 states that:

a. 'Applicants should comply with all legal requirements and any policy requirements set out in this NPS on the assessment of alternatives. In particular:

b. The EIA Directive requires projects with significant environmental effects to include an outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant's choice, taking into account the environmental effects.

c. There may also be other specific legal requirements for the consideration of alternatives, for example, under the Habitats and Water Framework Directives.

d. There may also be policy requirements in this NPS, for example the flood risk sequential test and the assessment of alternatives for developments in National Parks, the Broads and Areas of Outstanding Natural Beauty (AONB)'.

5.2.8 ES Chapter 3: Assessment of Reasonable Alternatives (Application Document 6.1) addresses the legal requirements under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, providing a description of reasonable alternatives and the identification of the main reasons for the option chosen taking into account the environmental effects of the development.

5.2.9 With regard to the second bullet the Habitats Regulations Assessment (HRA) – Screening Report and Statement to Inform an Appropriate Assessment (Application Document 6.5) explains that, where applicable, Stage 3 of the HRA process, includes the assessment of alternatives but the assessment concludes that there is no requirement to consider Stage 3 for the Project. A Water Framework Directive Assessment report (ES Appendix 14.7 (Application Document 6.3)) has been prepared for the Project.

5.2.10 The specific policies referred to in the third bullet are addressed in Chapter 6 of this document. The list of legal and policy requirements in paragraph 4.26 is, however, not exhaustive. Other policies contained within the NPSNN also include a specific requirement to consider alternatives (for example, paragraph 5.25 in relation to biodiversity and geological conservation) and these are also addressed in Chapter 6 of this document.

5.2.11 Guidance on compulsory acquisition of land also requires that all reasonable alternatives to compulsory acquisition have been explored which is addressed in Chapter 5 of the Statement of Reasons (Application Document 4.1)

5.2.12 Paragraph 4.27 of the NPSNN then sets out the need for all projects to be subject to an options appraisal which should consider viable modal alternatives and may consider other options. It states that:

> *'All projects should be subject to an options appraisal. The appraisal should consider viable modal alternatives and may also consider other options (in light of the paragraphs 3.23 to 3.27 of this NPS). Where projects have been subject to full options appraisal in achieving their status within Road or Rail Investment Strategies or other appropriate policies or investment plans, option testing need not be considered by the examining authority or the decision maker'.*

5.2.13 For ease of reference, paragraphs 3.23 and 3.27 of the NPSNN (referred to at 4.27) relate to Government policy on road tolling and charging.

5.2.14 The Project has been subject to an options appraisal process, and is included in Road Investment Strategy 2: 2020–2025, March 2020, DfT and National Highways (RIS2), in accordance with the policy requirement of paragraph 4.27. The Project recognises that compliance with this requirement under paragraph 4.27 does not circumvent any legal or policy requirement in accordance with paragraph 4.26 and may not (as an investment decision process) involve all the considerations which should be taken into account under the development consent process. The assessment of alternatives undertaken for the Project (outlined in this chapter) does not, therefore, solely rely on the assessment of options for the purpose of informing the RIS process as outlined in paragraph 4.27.

5.2.15 The Project requires the diversion of utilities which in four cases are NSIPs in their own right and NPS EN-1 has effect for these elements. Like the NPSNN, NPS EN-1 provides a section on 'alternatives' as one of the Assessment Principles (at Section 4.4).

5.2.16 Paragraph 4.4.1 advises that

> *'As in any planning case, the relevance or otherwise to the decision-making process of the existence (or alleged existence) of alternatives to the proposed development is in the first instance a matter of law, detailed guidance on which falls outside the scope of this NPS. From a policy perspective this NPS does not contain any general requirement to consider alternatives or to establish whether the proposed project represents the best option.'*

5.2.17 Like paragraph 4.26 of the NPSNN, paragraph 4.4.2 notes various legal and policy obligations which require an assessment of alternatives (the list is similar to paragraph 4.26 and again is not exhaustive). Paragraph 4.4.3 provides some general principles on what weight should be given to alternatives although these are in the context of the need for new energy infrastructure which is not directly relevant to the Project (including the energy NSIPs).

5.2.18 NPS EN-4 and NPS EN-5 include further limited policy in relation to alternatives:

a. NPS EN-4 applies to the three gas pipeline diversion NSIPs and provides further specific policy guidance on alternatives in relation to these elements of the Project. At paragraph 2.21.3 it states, that *'the ES should include an*

assessment of the biodiversity and landscape and visual effects of the proposed route and of the main alternative routes considered' (see Section 5.9 of EN-1).

b. NPS EN-5 is applicable to the single electricity infrastructure NSIP and states at paragraph 2.8.7 that the decision maker *'…should recognise that the Holford Rules, and any updates, form the basis for the approach to routeing new overhead lines and take them into account in any consideration of alternatives and in considering the need for any additional mitigation measures'.*

5.2.19 Whilst the overhead line diversions required to facilitate the Project are effectively replacement structures of a comparable scale, the consideration of route options has had regard to industry standard routeing practices through the application of the Holford Rules (as outlined in Section 5.6) where appropriate. Specifically, the Project has sought to avoid areas of amenity value and to minimise the overall length of diversions and overall tower height as far as practicable.

5.2.20 The Draft EN-1 Overarching National Policy Statement for Energy published in September 2021 mirrors the adopted text above at paragraphs 4.2.12 to 4.2.13 as does the newly published 2023 NPS EN-1 in paragraphs 4.3.15, 4.3.17 and 4.3.22.

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5.2.21 It is relevant to this policy context regarding the consideration of alternatives, that National Highways – through Design Manual for Roads and Bridges (DMRB) LA 104 Environmental Assessment and Monitoring (Highways England, 2019) – have developed an internal process for assessing alternative options. This does not replace the specific legal and policy requirements referred to above but establishes a process which bakes in a consideration of alternatives as best practice. Further detail on the criteria and considerations relating to alternatives in LA 104 (and how they align with and assist in complying with legal requirements) is provided in ES Chapter 3: Assessment of Reasonable Alternatives (Application Document 6.1).

5.3 Assessment of alternative modes of transport

5.3.1 This section sets out the background to the evolution of the Lower Thames Crossing as the preferred approach for addressing capacity constraints at the Dartford Crossing but also outlines the options considered to deliver enhancements to alternative modes of travel, either as part of the Project design or through additional measures which fall outside the remit of the DCO. These measures are set out in detail within the Benefits and Outcomes Document (Application Document 7.20).

5.3.2 The process has been informed by various appraisals and reports dating back to 1995 which assessed and described the characteristics of the existing transport network to the east of London, with a view to establishing what role other modes (e.g. light/heavy rail, bus) might play in any plans for providing new capacity. This section, therefore, considers the viability of providing additional capacity for alternative modes of transport, identifies the likely benefits and considers the extent to which such options might meet the Scheme Objectives.

5.3.3 Particular reference is made below to the Department for Transport (DfT) 2009 Dartford River Crossing Study ('the 2009 study') commissioned to advise on the future requirement for crossing capacity across the lower River Thames and an initial evaluation of what role other modes might play in any plans for new capacity. As more information has been gathered and views have been sought from stakeholders, the Applicant has given further consideration to strategic modal alternatives with a view to ensuring the overarching Scheme Objectives would be realised (alongside ensuring the viability of the Project).

The DfT 2009 study

5.3.4 The 2009 study was undertaken by DfT to investigate how to address capacity constraints at the Dartford Crossing. The study included an initial consideration of what role other modes (e.g. light/heavy rail, bus) might play in any plans for new capacity, leading to agreed options for evaluation. This study built upon various reports and appraisals that had been carried out over the preceding 15 years leading up to its production. The following alternative modes were assessed by the 2009 study:

a. Cross-river rail provision in the Lower Thames area

b. Passenger rail provision

c. Rail freight provision

5.3.5 With regards to cross-river rail provision, the report noted that while the existing Dartford Crossing did not include rail provision, there were three cross-river crossings (Snow Hill tunnel near Blackfriars Bridge, the Chelsea Bridge and the High Speed 1 tunnel between Ebbsfleet and Purfleet).

5.3.6 With regards to passenger rail provision the report refers back to previous studies which concluded that current facilities were adequate. A further review was nevertheless undertaken, including a consideration of the case for the inclusion of rail facilities as part of any new or improved crossing in the Lower Thames area (an issue highlighted by stakeholders). The radial nature of commuting patterns in and out of London, the existing level of rail provision and also the lack of demand for rail travel between stations in the Thames Gateway area (Medway Towns to the London–Tilbury–Southend Line) meant a modal shift to rail was unlikely to be achievable through the provision of new cross-river rail provision.

5.3.7 With regards to rail freight, growth forecasts to 2031 were obtained from the Great Britain Freight Model. These indicated that rail freight growth in the south-east of England up to 2031 is likely to be focused at three locations:

a. Between the Channel Tunnel and the West Coast Main Line

b. Between the London–Tilbury–Southend Line and the West Coast Main Line

c. Between the Great Eastern Main Line and the West Coast Main Line

5.3.8 Chapter 6 of the 2009 study concluded that a new crossing in the Lower Thames area, that incorporated heavy railway infrastructure, providing an additional railway crossing option over the Thames would only serve movements between the Isle of Grain and Medway. Freight forecasts suggest

minimal growth to 2031 in these areas, with little scope for modal shift away from road movements. Further, it concluded that spare capacity existed between the Channel Tunnel and West Coast Main Line for international freight services (via Maidstone and Swanley), however, this was forecast to be absorbed by 2031.

5.3.9 Importantly the 2009 study concluded that the short haul distribution market was dominated by road as there is insufficient rail intermodal distribution terminals to provide an alternative. This situation is not expected to change significantly, and so it is very unlikely that sufficient new infrastructure will be developed to enable a significant proportion of the 340 million tonne-kilometres to be transferred to rail. Whilst the 2009 study indicated the likelihood of freight capacity issues by 2031, it concluded that the inclusion of rail freight provision as part of any new Lower Thames Crossing is unlikely to address these issues and may even lead to a deterioration in rail congestion at certain points in the network.

5.3.10 The majority of stakeholder feedback referred to within the 2009 study considered that linking the rail network in the south of the Thames Gateway to the rail network in the north of the Thames Gateway would deliver limited benefits.

5.3.11 Providing a service that will transfer a sufficient number of passengers to rail is not feasible as the diverse pattern of origins and destinations of the trips are not currently satisfied by rail and given the future rail networks structure, the majority of these trips will continue to be made by road.

Further assessment of alternative transport modes

5.3.12 Whilst the 2009 study recommended that provision of rail capacity crossing the Lower Thames should not be considered further, this option (alongside other modal alternatives) has been reconsidered to validate whether the conclusions hold true. In particular, this has included a consideration of the following:

a. Road based public transport and non-motorised modes that could eliminate/reduce the need for the new crossing or change the location.

b. Rail based passenger services to replace the road crossing with a rail crossing (or provide a road/rail crossing of a different standard).

c. Rail based freight services to reduce the truck traffic and reduce/eliminate the need for a new road crossing or provide a road/ rail crossing solution.

d. Ferries across the Thames as an alternative or supplement to a fixed crossing.

e. Non-motorised modes (cycling and walking).

5.3.13 A key aspect of the analysis undertaken has been to establish the extent to which other modal alternatives would meet the Scheme Objectives, having regard to the fact that the proposed solution for the new crossing is forecast to carry an additional daily 55,400 passenger and freight vehicles in 2030 and 80,700 passenger and freight vehicles in 2045, including the reduction in traffic levels on the Dartford Crossing by 19% compared with the Without Scheme.

5.3.14 With regards to road based public transport, traffic models have established that the majority of the traffic is not travelling between Kent and Essex and the diverse pattern of origins and destinations makes the provision of viable bus services difficult. Routing via the Dartford Crossing adds significantly to the length of any services linking north Kent and south Essex. Having regard to this, along with the very large number of bus services which would be required to carry the estimated passenger trips per day, as indicated above, (and to cater for the diverse origins and destinations of the trips) the provision of road based public transport as a modal alternative would not meet the Scheme Objectives.

5.3.15 By providing a new connection between the A2, the A13, and the M25, the Project would create new routing opportunities for road based public transport. There would be capacity on the proposed new road to accommodate future provision of new local and regional road based public transport services by relevant organisations. In addition, local buses would be exempted from paying the road user charge under the proposed charging scheme, avoiding additional costs, as set out in the Road User Charging Statement (Application Document 7.6) and the draft DCO (Application Document 3.1).

5.3.16 With regards to passenger rail, a review of these findings by National Highways indicates that current passenger rail demand between stations from the north Kent/ Medway towns to and from stations in south Essex, along with total travel volumes between north Kent/Medway towns and south Essex, remain low in each case. Radial movements into and out of London from either Kent or south Essex, rather than across the Thames to the east of London continue to be the principal form of rail travel for the region. Furthermore, a service sufficient to accommodate the projected number of passengers, along with their diverse origins, would not be feasible. The conclusion reached at the time of the DfT 2009 study, therefore, remains valid and the provision of new rail capacity as a modal alternative to the Project would not meet the Scheme Objectives.

5.3.17 With regard to rail freight, the short haul distribution market remains reliant on travel by road as there are not enough rail intermodal distribution terminals to provide an alternative. This situation is not expected to change significantly over the foreseeable future, and so it is very unlikely that sufficient new infrastructure will be developed to enable a significant proportion of the 340 million tonne-kilometres to be transferred to rail. Having regard to this, along with the fact that the development of new routes will have to be competitive against road freight, enhanced rail freight would not represent a viable modal alternative to the Project and the conclusions reached previously in 2009, therefore, remain valid.

5.3.18 The provision of a ferry service across the river as an alternative to a road or rail crossing has been considered as a potential modal alternative. However, the volume of vehicles that would need to be carried by a ferry is 87,400 vehicles/day in 2030, rising to 102,600 vehicles/day in 2045 to provide the same level of relief at the Dartford Crossing delivered by the Project. Whilst ferries could contribute a small complementary service to link local destinations such as Lakeside, Bluewater and the proposed London Resort, ferries will not provide the level of service required to be a viable alternative to new road crossing capacity.

5.3.19 With regards to non-motorised modes, cycling and walking will never satisfy more than a very small portion of the demand and does not meet the objectives set out for the Lower Thames Crossing. They would, therefore, not represent a viable alternative to the provision of a road crossing.

Complementary provision for alternative modes

5.3.20 As highlighted within Chapter 4, the need for the Project has been driven by the current issues being experienced at the Dartford Crossing and the impact this is having upon the strategic network alongside its role in supporting national economic growth. Notwithstanding, with regard to the Scheme Objectives above, the extent to which the Project might facilitate inter-urban and cross-river public transport connectivity and also non-motorised transport has been considered.

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5.3.21 Throughout this process there has been an acknowledgement of the fact that any potential enhancements would be dependent upon the commercial decision of bus operators. The strategic nature of the Project is such that as local buses use smaller local roads that would not be appropriate to connect to the new road, there would be fewer opportunities to connect to the local road network. Furthermore, to the north of the Thames, the proposed connection points are away from the more densely populated southern part of Thurrock.

5.3.22 With regards to non-motorised transport, the Project has sought to ensure that all walking cycling and horse riding (WCH) routes that will be severed by the route (and historic severances where reasonably practicable) will be reconnected. As part of the wider WCH strategy, routes have been upgraded to improve connectivity and access for more users. Where appropriate bridges have been designed to accommodate active travel, and tie into the wider footpath and bridleway network. The WCH strategy has also explored improving and enhancing WCH network connectivity between the surrounding communities. Total additional and improved provision equates to 64km of routes. These are summarised in Table 13.54 of ES Chapter 13: Population and Human Health (Application Document 6.1).

Conclusion

5.3.23 The assessment of alternative modes demonstrates that the need for the Project, stemming from existing congestion at the Dartford Crossing, cannot be resolved by provision of a new rail crossing, provision of a ferry service, or provision of active travel measures. While road based public transport may be a contributory element to the solution, this is not achievable without the provision of a new road crossing.

5.3.24 The new routing opportunities provided by the crossing would allow for complementary modal provision in the form of road based public transport. Whilst not providing a direct replacement for a new Lower Thames Crossing these measures have the potential to reduce the rate of growth in road traffic and increase the longevity of the infrastructure.

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5.3.25 Furthermore, outside the framework of the DCO application, National Highways has set up a Sustainable Transport Working Group (STWG) with a range of local partners. Amongst other measures, this group is investigating cross-river connectivity enhancements such as improvements to existing ferry services. More information is set out in the Benefits and Outcomes Document (Application Document 7.20).

5.4 Route selection

5.4.1 This section sets out the key stages that led to the selection of the Preferred Route Announcement (PRA) by DfT, and subsequent reappraisal by the Project that confirms those conclusions remain valid today.

5.4.2 The section begins with an overview of the timeline. It then sets out a summary for each stage in the process, followed by the work undertaken to reappraise and confirm the decisions made in that stage.

Timeline overview

5.4.3 The six main route corridor options (which are presented within Plate 5.1 below) initially identified were:

a. A – Additional Capacity at the Existing Dartford Crossing

b. B – Swanscombe Peninsula Link to the A1089

c. C – East of Gravesend and Link to the M20

d. D1 – M2 Link to A130 via Cliffe/Pitsea

e. D2 - M2 Link to A130 via Canvey Island

f. E – Isle of Grain Link to East of Southend

5.4.4 These corridor options were identified in the 2009 study following a series of studies dating back to 1994, when research was still being undertaken to increase understanding in relation to the impacts of the various alternative routes seeking to provide cross-Thames crossing capacity. In particular, the identification of route corridor options was informed by available traffic data, census data and transport models to establish the nature of current demand at the Dartford Crossing, the likely evolution of that demand and the impact that various options might have.

5.4.5 Numerous route alternatives have been considered within each of the six broad corridor options and, within selected corridors, a series of more refined routes have also been considered.

5.4.6 Whilst in some cases, corridors and potential route options have been ruled out early in the process, as more information has been gathered, the Applicant has sought to ensure that the previous work undertaken to identify the preferred route, and discount other routes, remains valid. A review was, therefore, carried out in 2018, prior to the Statutory Consultation, of all the options for the Project, starting with the six options first presented by DfT in 2009 and concluding with the announcement of the preferred route. This review is reported in the

Approach to Design, Construction and Operation (Highways England, 2018b). The appraisal was revisited again for this application.

5.4.7 A timeline which sets out the process to identify and assess potential options for the Project up to the submission of the Application is presented in Table 5.1 below. The routes referred to within Table 5.1 are described in further detail within the sections which follow.

Table 5.1 Project evolution and alternatives history

2009	**Dartford River Crossing Study 2009** Dartford River Crossing Study (Parsons Brinckerhoff, 2009)	Owing to increasing demand at the Dartford Crossing, the DfT looks at options for an additional crossing at six potential locations (A, B, C, D1, D2 and E). The two furthest east (D and E) are ruled out as they are too far from the existing crossing. Rail is also ruled out as an alternative mode (see Section 5.3 above).
2013	**2013 Options Consultation** Review of Lower Thames Crossing Options: Final Review Report	The DfT carried out a public consultation to ask for views on the location of the proposed crossing.
	Options for a New Lower Thames Crossing (DfT, 2013)	The response to the consultation confirms the need for a new crossing between Kent, Thurrock and Essex. Location Option B is ruled out; the remaining two locations (A and C) are to be investigated further
	Options for a New Lower Thames Crossing – Consultation Response Summary (DfT, 2013)	
2016	**2016 Route Consultation** Pre-Consultation Scheme Assessment Report (Highways England, 2016)	DfT asked Highways England to assess the economic, traffic, environmental and community impacts for Location Options A and C. Further work is undertaken to assess these locations and develop more refined proposals. This resulted in a series of short-options, including at Location Option C three routes north of the river in Thurrock and Essex called Routes 2, 3, and 4, and two south of the river in Kent, the Eastern Southern Link (ESL) and the Western Southern Link (WSL). A crossing at Location Option A known as Route 1 is also shortlisted for assessment, but concluded as not viable. Non-statutory route consultation between January and March 2016 (informed by the Scheme Assessment Report) asks for feedback on proposals, including the three routes north of the river in Thurrock and Essex Routes 2, 3, and 4, and two south of the river in Kent, the ESL and the WSL. The consultation also included information as to why Route 1 was not considered viable. The consultation recommended Route 3 and the ESL, at Location C, as together they offered the most direct route, leading to greater economic benefits and congestion relief.

2017	**Post-Consultation Scheme Assessment Report** (Highways England, 2017)	Following feedback from the consultation, a further appraisal was undertaken on Route 1 at Location A, and Routes 3 and 4 at Location C. Route 2 was discontinued from further appraisal.
		The 2017 appraisal identified that Route 1 at Location A with either a bridge or bored tunnel was not a viable option and failed to relieve the congestion on the approaches to the Dartford Crossing as it did not provide a suitable alternative route for traffic travelling along the A2 and A13.
		The Secretary of State for Transport announces the preferred route (Route 3), a bored tunnel under the River Thames east of Gravesend and Tilbury (Location C, Route 3, with the WSL). This announcement confirmed the use of Route 3, but changed to the WSL as this resulted in a materially lower impact than the ESL on the environment and local communities
2018	**Statutory Consultation** Approach to Design, Construction and Operation (Highways England, 2018b)	All route options were reappraised prior to the 2018 Statutory Consultation, including the six route corridor options, and all of the more refined route options considered in the preparation for 2016 Route Consultation. This review is reported in the Approach to Design, Construction and Operation (Highways England, 2018b) and also took into account new information since 2017, including updated traffic modelling, new local plans, and the design changes to Route 3 WSL since the preferred route announcement. The reappraisal found that the basis of the decision not to take forward Location B, Location D (both D1 and D2) and Location E remained valid, and to proceed with Route 3 at Location C remained valid. The reappraisal found that the decision not to proceed with Location A and, at Location C the decision to proceed with WSL instead of ESL, warranted further consideration. New traffic modelling was used to reconsider Route 1 at Location A. This work demonstrated that the journey time savings from Route 1 were less than a quarter of those delivered by the preferred route, and that the modelling still indicated that Route 1 would not improve the resilience of the wider road network. It was concluded that the decision not to proceed with Route 1 remained valid. To reappraise the decision to proceed with the WSL, the adverse effects of the design presented at Statutory Consultation were compared against the effects of the ESL identified in the 2016 appraisal. There was shown to be very limited opportunity to reduce the community and environmental impacts on the AONB, Site of Special Scientific Interest (SSSI) and ancient woodland resulting from the ESL (which would have a larger transport footprint and greater loss of ancient woodland that the WSL). It was concluded that the WSL remained the best option, considering the environmental and community impacts of the ESL. The reappraisal of the options reviewed found that the decision to take forward Route 3, Location C as the preferred route remained valid.

2020 – 2022	Preparation of the application for development consent	The reappraisal of all options has been reviewed to verify that the previous decisions remain valid. The reappraisal found that the basis of the decision not to take forward Location B, Location D (both D1 and D2) and Location E remained valid, and to proceed with Route 3 at Location C remained valid. The reappraisal found that the decision not to proceed with Location A and at Location C the decision to proceed with WSL instead of ESL, again warranted further consideration.
		The decision to proceed with the development of the WSL was reappraised, considering the changes made following the 2018 Statutory Consultation in combination with the changes made prior 2018 and following the PRA. To support the assessment of the ESL, the design of the route considered before PRA was updated to allow a closer comparative reappraisal against the current WSL. Following this reworking, the ESL was reappraised against the Scheme Objectives, and the current WSL. This assessment showed that the previous conclusions reached in 2017 remained valid.
		The reappraisal of Route 1 was undertaken in consideration of the changes in the traffic forecasts arising from updates to the transport model since 2018. This work revalidated the assessments carried out prior to the Statutory Consultation, in 2018, which found that Route 1 failed to achieve the transport objectives. It was concluded that the previous assessment remained valid.
		Submission of DCO application 2022

Reappraisal methodology

5.4.8 Within this document each stage of the route selection process is described, and the routes that are taken forward and those that are not selected are presented. Following this summary of the stage, the work that was undertaken to reappraise these decisions is presented. This section presents the methodology that is used to reappraise the decisions made.

5.4.9 The reappraisal was undertaken twice, the first in 2018 prior to the Statutory Consultation, and then a further reappraisal was undertaken for the preparation of this application.

5.4.10 The 2018 reappraisal was reported in the Approach to Design, Operation and Construction (Highways England, 2018a). This reappraisal considered additional information that had been gathered since the previous decisions were made, including:

a. New and emerging local plans – new local plans were published by Gravesham Borough Council and Dartford Borough Council. The London Borough of Havering consulted on a new draft Local Plan, while Gravesham Borough Council had consulted on planned further updates to their Local Plan.

b. A new traffic model – the Lower Thames Area Model (LTAM) – based on updated traffic data gathered in 2016 and using DfT national traffic forecasts that were updated at the time.

c. Changes to the proposals that were implemented between the Preferred Route Announcement in 2017 and the reappraisal in 2018.

5.4.11 Further reappraisal has undertaken during the preparation of this application, and similar matters were considered. Since the 2018 appraisal, the following additional information has been considered:

a. New and emerging local plans – Dartford Borough Council consulted on a new local plan, which is currently in Examination. The London Borough of Havering and Brentwood Borough Council adopted a new Local Plan, while Medway Council had consulted on planned further updates to their Local Plan.

b. The updated traffic model – the LTAM – updated to reflect the latest project alignment and the most recent DfT national traffic forecasts.

c. Further changes to the proposals that were implemented between the Statutory Consultation in 2018 and the current proposals, considered cumulatively with the earlier changes.

5.4.12 In order to give appropriate reappraisal of the decisions, it is necessary to set out key changes that have taken place after the initial decision was made. These changes are indicated where appropriate in the narrative, and a more comprehensive discussion, setting out the design evolution, and providing a discussion covering all of the changes made to the proposals is provided in Section 5.5.

Dartford River Crossing study – 2009

5.4.13 DfT commissioned an initial study in 2009 (the 2009 study) to address capacity constraints at the Dartford Crossing. The study was based upon a review of previous reports and appraisals undertaken at the Dartford Crossing over the previous 15 years and reviewed six potential crossing locations (presented within Plate 5.1 below) between the existing Dartford Crossing and the Isle of Grain. The location options included a link between the M2 and M20, along the A229, with the potential to enhance the benefits from the Project.

Initial route identification

5.4.14 The route corridors considered within the 2009 study were identified as the most likely corridors in which a new route could be delivered. The six options are shown as corridors of varying width, within which there are multiple possible alignments. This was informed by a combination of previous studies, stakeholder consultation, other published information, a review of current land use and transport infrastructure. Stakeholder engagement included the consideration of opportunities to improve transport capacity in the Thames Gateway, specifically in terms of cross-Thames crossing capacity.

5.4.15 The following two studies were appraised in the route identification process:

a. Lower Thames Crossing Study, 1994 for the Highways Agency

b. The Dartford Local Crossing Study Report, 1998 for the Government Offices for London, East of England and the South East of England

5.4.16 The 2009 study (paragraph 10.89) states that '*Option A was developed in response to conclusions in the 2005 report entitled Getting the most out of the Dartford Crossing'*. The report identified that in the southbound direction across the Queen Elizabeth II Bridge, it might be feasible to remove the existing toll plaza and accept that tolls would only be paid by northbound traffic.

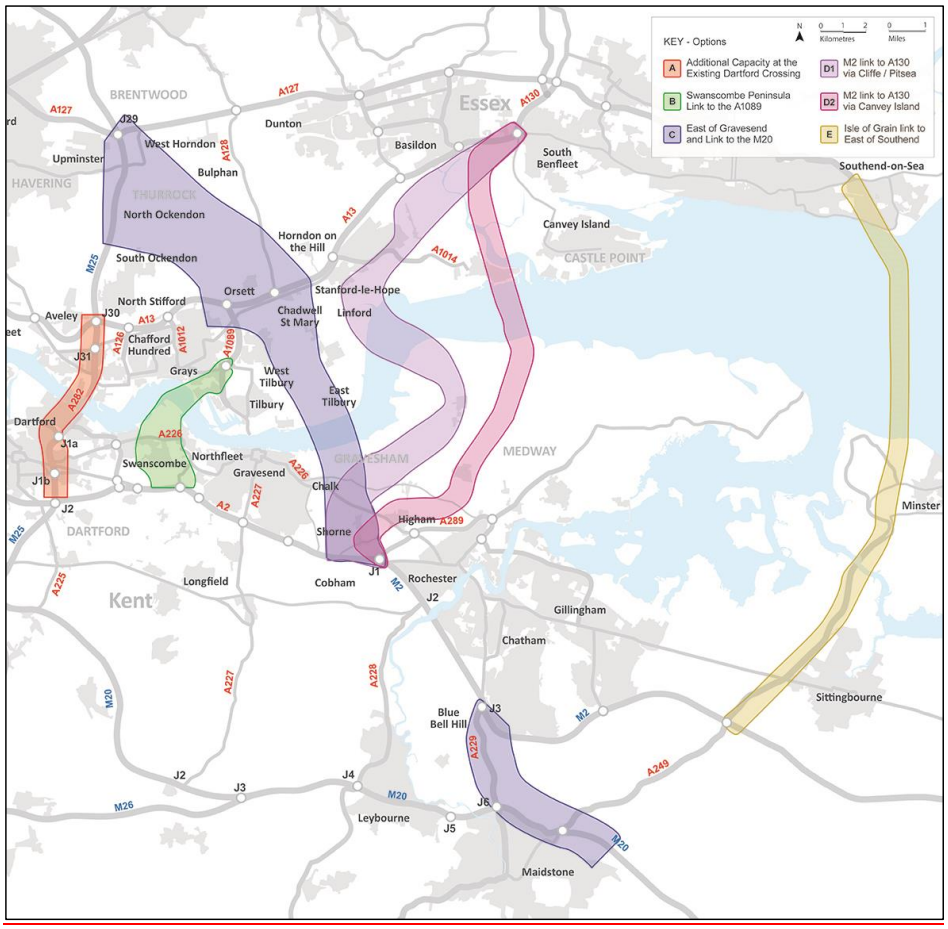
5.4.17 Paragraph 10.176 of the 2009 study indicates that Location Option B was identified in order to understand the '*impact of a solution for local traffic to relieve the existing Dartford Crossing'*.

5.4.18 Location Option C was selected for its potential to provide a more strategic route and support regeneration in the Thames Gateway area.

5.4.19 Two alignments were identified for Location Option D to allow alternatives for connections to the east and west of London Gateway port.

5.4.20 Location Option E was identified in response to stakeholder engagement (see paragraph 10.395 of the 2009 study).

Plate 5.1 Six locations investigated in the 2009 study



Key

A	Additional capacity at the existing Dartford Crossing
B	Swanscombe Peninsula Link to the A1089
C	East of Gravesend and Link to the M20
D1	M2 Link to A130 via Cliffe/Pitsea
D2	M2 Link to A130 via Canvey Island
E	Isle of Grain Link to East of Southend

Initial Route Corridor Options assessment

5.4.21 In the 2009 study each route corridor option was assessed against DfT's goals, as defined in Delivering a Sustainable Transport System (DfT, 2008) (DaSTS):

a. To support national economic competitiveness and growth, by delivering reliable and efficient transport networks

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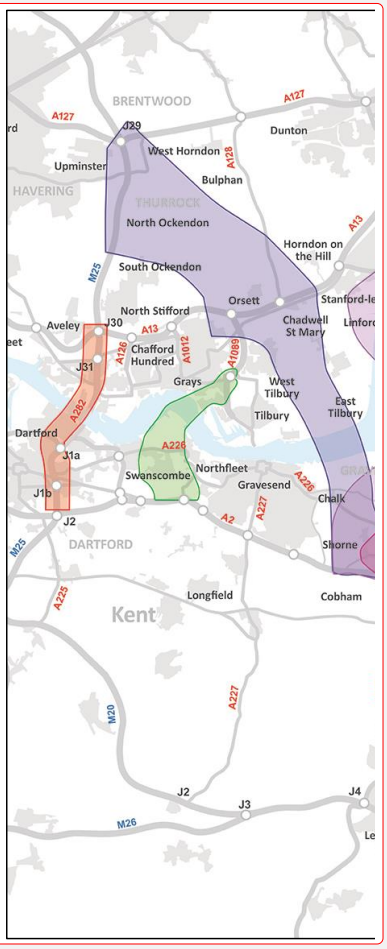


b. To reduce transport's emissions of carbon dioxide and other greenhouse gases, with the desired outcome of tackling climate change

c. To contribute to better safety security and health and longer life-expectancy by reducing the risk of death, injury or illness arising from transport and by promoting travel modes that are beneficial to health

d. To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society

e. To improve quality of life for transport users and non-transport users, and to promote a healthy natural environment

5.4.22 In identifying the main constraints and opportunities in the delivery of each option, assessments were undertaken to identify the potential business case for each, with respect to the five high level government goals identified in DaSTS and also against a refined set of specific objectives for the future success of the Crossing. The detailed assessments for each of the options are contained within Chapter 10 of the 2009 study.

5.4.23 These assessments included analysis, as appropriate, to this phase of the 2009 study in the following areas:

a. Traffic assessment

b. Wider economic benefit assessment

c. Environmental appraisal

d. Integration and accessibility assessment

e. Stakeholders' views

5.4.24 For each option, a preliminary design and assessment was carried out and is described under the following technical headings:

a. Preliminary engineering assessment of an alignment to provide a Corridor Description and Alignment

b. Traffic Assessment using the traffic models

c. Consideration of Wider Economic Benefits Assessment

d. Environmental Appraisal covering several sub-disciplines

e. Consideration of linkages to other modes is described under Integration and Accessibility

5.4.25 The environmental appraisal element of the assessment involved specialist studies in relation to the following disciplines:

a. Air quality – specifically relating to road traffic related air quality issues

b. Noise – specifically relating to road traffic related noise issues

c. Landscape, Townscape and Visual Amenity

d. Archaeology and cultural heritage

e. Biodiversity

f. Water – relating to flooding, surface water and groundwater resources

5.4.26 The assessments were undertaken in line with the principles of the methodologies provided in the following guidelines:

a. Design Manual for Roads and Bridges (DMRB)

b. Transport Analysis Guidance (TAG)

5.4.27 Alongside a detailed assessment of each option, a summary of the Stakeholder's Views of each option is provided within Chapter 10 of the 2009 study.

5.4.28 A summary of how each option performed against these objectives is provided in Table 5.2.

Table 5.2. Performance of Options against the DaSTS goals

DaSTS goal	Option A Additional capacity at the existing Dartford Crossing	Option B Swanscombe Peninsula link A2 to the A1089	Option C East of Gravesend and link to the M20	Option D M2 link to Canvey Island	Option E Isle of Grain link to east of Southend
To support national economic competitiveness and growth, by delivering reliable and efficient transport networks	Moderate Beneficial Impact	Slight beneficial Impact	Moderate Beneficial Impact	Slight Beneficial Impact	Slight Beneficial Impact
To reduce transport's emissions of carbon dioxide and other greenhouse gases, with the desired outcome of tackling climate change	Slight adverse impact	Slight adverse impact	Moderate Adverse Impact	Slight adverse impact	Slight adverse impact
To contribute to better safety security and health and longer life expectancy by reducing the risk of death, injury or illness arising from transport and by promoting travel modes that are beneficial to health	Slight Beneficial Impact	Slight Beneficial Impact	Slight Beneficial Impact	Slight Beneficial Impact	Slight Beneficial Impact
To improve quality of life for transport users and non-transport users, and to promote a healthy natural environment	Slight adverse impact	Moderate adverse impact	Large adverse impact	Large adverse impact	Likely to be Large adverse
To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society	Slight Beneficial impact	Slight Beneficial Impact	Slight Beneficial Impact	Neutral	Neutral

Extract from paragraph 1.62 of the 2009 study

5.4.29 The overall assessment score provided for each DaSTS goal is based on a 'balanced view', rather than the most significant impact found, as it was *'recognised that at this preliminary stage, there could be further modifications to the route to reduce the likelihood or risk of incurring large adverse impacts'* (paragraph 10.74). This reflects the fact that the report was an initial assessment.

Recommendations of the 2009 study

5.4.30 As a result of this assessment, crossing Location Options A, B and C were recommended for further consideration, while crossing Location Options D and E were discounted. The main reasons which led to each of the options being discounted are set out below.

5.4.31 Location Option D would provide a new crossing connecting the M2 west of Gillingham to Canvey Island and South Essex west of Southend. It would connect the M2 to the A228 and A13/A130. Table 5.3 shows a summary of the approximate dimensions of Location Option D1 Cliffe and Location Option D2 Canvey.

Table 5.3 Location Option D Overview

Location Option D – M2 Link to Canvey Island	Location Option D1 Cliffe	Location Option D2 Canvey
Length of route (between the A13 and M2)	27km	23km
Bridge Air Draft*	70m	90m
Approximate length of Bridge Crossing and associated structure	3.8km	4.8km
Approximate length of immersed tube tunnel crossing **	4.8km***	4.8km***
Approximate length of bored tunnel crossing	5.5km***	5.5km***

Extracted from Figure 10-24 from the 2009 study

** Air draft is assumed to be the clearance at low tide*

*** It is assumed that the tunnel portals were located outside ecologically sensitive areas and that flood prevention measures would be constructed around tunnel portals inland in floodplain areas*

**** Likely that structural solution would also be required to cross 4.7km of Bowes Marshes for immersed tube tunnel and 4km for bored tunnel*

5.4.32 The 2009 study states that Location Option D would result in a reduction in traffic demand at the existing Dartford Crossing of approximately 3% by 2031 (in comparison with the 15% predicted at the time for Location Option C). This level of reduction is described as insufficient to ensure the free flow operation of the Dartford Crossing or resolve existing congestion issues. In view of its location downstream from the existing Crossing with no direct connection to the M25, it was predicted that this option would carry a low volume of traffic because of the lack of incentive for long distance traffic to divert away from the main motorway corridor.

5.4.33 The same study sets out that Option E would result in a slight reduction of 5% in the overall traffic demand on the existing Dartford Crossing, that this level of reduction was minimal and was likely to result in the Dartford Crossing continuing to operate over capacity.

Reappraisal of the recommendations in the 2009 study not to proceed with Location Options D1, D2 and E

5.4.34 In recognising the preliminary nature of the assessments within the 2009 study, the decision not to take forward locations D1, D2 and E was reassessed in 2018, as reported in the Approach to Design, Construction and Operation (Highways England, 2018), and again in preparation of this application, to determine whether changes that had arisen since 2009 would lead to a different decision.

5.4.35 The 2009 study determined that overall, Location Options D and E were predicted to generate only a fraction of the Wider Economic Benefits of Location Options A, B and C in that they would not serve long distance traffic movement from the South East to the Midlands and North, to the beneficial national, strategic and regional extent that Location Options A, B and C would.

5.4.36 Both the assessment in 2018 and that reported here considered the new traffic information available from the 2016 traffic baseline. The 2016 traffic baseline demonstrated the continued importance of providing connectivity to the Midlands and North, requiring connectivity to the M25 north of the River Thames in order to provide relief to the Dartford Crossing and the approach roads.

5.4.37 Location Option D (both D1 and D2) are located to the east of the proposed route, providing connections between the A2/M2 and the A130, while Location Option E is located further east connecting the M2 to the A127 at Southend-on-Sea. Each of these locations option would fail to provide a direct connection to the M25, and in addition Location Option E would have very poor connections to the approach roads to the existing Crossing. There would be, therefore, no incentive for long distance traffic to divert away from the main motorway corridor. The 2016 traffic baseline demonstrated the continued importance of providing connectivity to the M25 north of the River Thames in order to provide relief to the Dartford Crossing and the approach roads. As a consequence, these routes would fail to meet the objective of relieving the congested Dartford Crossing and the decision not to take forward Location Option D (both D1 and D2) and Location Option E remains valid.

2013 options consultation

Review of Lower Thames Crossing options: final review report (AECOM, 2013)

5.4.38 AECOM was commissioned by the DfT in 2012 to carry out a further review of the options. The link between the M2 and the M20, presented in 2009 as a component of Location Option C was separated out, and presented as an optional additional modification to Location Option C named C variant. AECOM reported the findings in relation to the merits of Location Options A, B, C and C Variant in the Review of Lower Thames Crossing Options: Final Review Report (AECOM, 2013).

5.4.39 This report was informed by a structured assessment of economic, environmental, social and distributional impacts of each option, based upon TAG. The impacts were examined, using qualitative, quantitative and monetised information. In assessing value for money, all of these are consolidated to compare the overall benefits and costs. The first stage was to review constraints of particular importance at each of the locations that could materially influence cost, or present potential risks of a future scheme having particularly significant impacts. Conceptual designs were then developed as a basis for assessing the feasibility of a new crossing at each location option and to estimate capital costs. This was followed by a review of the Highways Agency's existing M25 model, other local models, and readily available data, followed by the development of demand forecasts.

5.4.40 Table 2.1 of the 2013 AECOM report summarises the impacts considered in the economic case and indicates whether they are monetised, and where initial scoping identified the need for social and distributional impacts (SDI) analysis. The final column indicates the TAG guidance that has been adhered to. In part the evidence is based on traffic forecasts. In accordance with TAG guidance the monetised impacts are expressed in the economic case as costs or benefits in present value terms calculated over a 60-year appraisal period.

5.4.41 The key conclusions reached in relation to Location Options A, B and C within the 2013 AECOM report are summarised as follows:

a. Forecasts indicate that the potential impacts of additional congestion along and near the A2 and A13 east of Basildon corridors are likely to be greatest for Location Option B compared with the other options.

b. The route changes did not offset the forecast growth in traffic and accordingly the overall assessment indicated that carbon emissions would increase.

c. Location Option B, in contrast to Location Option C, traverses planned development sites north of the A2 corridor, particularly on the Swanscombe Peninsula.

d. A particular risk would be how the new route would connect with the A13 and A2. The A13 is congested and the planned development along the A2 corridor is forecast to result in congestion along the A2. At this formative stage additional delays along the A2 and A13 corridors were forecast to offset some of the benefits of providing a new route.

e. The enhanced connectivity delivered by Location Option C was forecast to provide much greater economic benefits than Location Options A or B, largely through enabling the agglomeration of business activity. The value of the wider economic benefits over 60 years that would be brought forward by Location Option C (and also the C variant) was stated to be approximately six times larger than for Location Option A, and nearly three times larger than for Location Option B.

f. Location Option C would result in the greatest reduction in carbon emissions because it offers a new, shorter route for some long distance traffic. Location Option C was also less likely than Location Option B to

impose additional stress on the A2 and A13 road corridors. In consequence there is likely to be less difficulty in designing a scheme at Location Option C to deliver forecast highway journey time savings than for a new crossing at Location Option B.

5.4.42 With regard to Location Option C variant, the report stated that there would be significant engineering challenges and costs in delivering the widened A229 link between the M20 and M2, and that the business case for Location Option C would not be materially improved by extending the route south to the M20. It concluded that for the purposes of selecting between Lower Thames Crossing location options, Location Option C could be compared directly with Location Options B and A, as the economic case for Location Option C was not dependent on the additional infrastructure in Location Option C variant.

Options for a new Lower Thames Crossing (DfT, 2013a)

5.4.43 Following on from the AECOM report, a consultation was then held by the DfT, to gather views on the remaining three potential crossing locations, between the existing Dartford Crossing and East Tilbury, (A, B, C and C variant) in more detail. The feedback sought would then help inform the location for the new crossing prior to developing the scheme further. Therefore, the document did not present specific scheme proposals, but included illustrative routes in order to inform the review.

5.4.44 The three engineering solutions considered previously by DfT in 2009, namely a bridge, an immersed tunnel and a bored tunnel were presented for consideration at each location. The impacts of each location were assessed against economic, social and environmental factors as summarised in Table 5.4.

Table 5.4 Options for a new Lower Thames Crossing: impacts assessed

Economic	Social	Environmental
Impacts on business users	Impacts on consumers (users for personal and commuting trips)	Exposure of population to noise
Congestion and resilience	Distributional impacts on different income groups	Air quality
Wider economic impacts	Impacts on accident numbers	Greenhouse gas emissions
Regeneration		Townscape/landscape and heritage
		Habitats and biodiversity
		Water

Extract from Table 6.1 from Options for a New Lower Thames Crossing (DfT, 2013a)

5.4.45 The location options were also assessed to establish whether they would be likely to represent value for money. Impacts were monetised, where possible, but otherwise assessed qualitatively. The values were calculated twice, firstly without the inclusion of wider economic impacts, and secondly including wider economic impacts (subject to greater uncertainty).

5.4.46 With regard to Location Option A, the report concluded that this option was predicted to perform better than the other options in terms of alleviating congestion on the existing crossing and adjacent sections of the M25, but could add delay to the A13 eastbound. It would not improve the connectivity of the strategic road network and was, therefore, forecast to stimulate relatively limited economic growth when compared with the other options. It would also potentially impact on several planned developments within Dartford and Thurrock.

5.4.47 Location Option B was predicted to alleviate congestion at the existing crossing to a lesser extent than Location Option A and could add delay to the A2 and A13 east of Basildon. Out of all three options, Location Option B was predicted to have a significant adverse impact on committed development, in particular the Ebbsfleet Valley Development, in contrast to Location Option C which was predicted to have no negative impacts on committed developments. With regard to network resilience, Location Option B was predicted to have adverse impact through worsening of congestion on the A13 eastbound, alongside additional pressure on the A2.

5.4.48 Location Option C was predicted to alleviate congestion at the existing crossing to a similar extent as Location Option B and was less likely to add delay to the A2 and A13 east of Basildon. It was, therefore, expected to result in greater journey time savings than Location Option B. As a result of the improved connectivity, this option was also forecast to achieve greater economic benefit than Location Options A and B. Further, Location Option C would provide a more direct route for many journeys, with a related significant decrease in greenhouse gas emissions. A comparison of the predicted economic benefits for the three options is presented in Table 5.5.

Table 5.5 Location Options A, B and C: contribution to the national economy

	Location Option A	Location Option B	Location Option C
Time saved to business users	£700 million *(positive impact)*	£1,100 million *(positive impact)*	£1,900 million–£2,600 million *(very positive impact*
Wider Economic Benefits	£250 million *(positive impact)*	£600 million *(positive impact)*	£1,300 million–£1,500 million *(very positive impact)*
Improved Connectivity (by 2025)	500 jobs relocated to the Thames Gateway area *(positive impact)*	2,100 jobs relocated to the Thames Gateway area *(very positive impact)*	3,000–3,200 jobs relocated to the Thames Gateway area *(very positive impact)*
Journey times using new crossing	New crossing would be located next to existing crossing	Shortened between some towns in Essex and Kent if new crossing is used *(positive impact)*	Many journeys shortened when new crossing is used, both within the south-east and nationally *(very positive impact)*

Extract from Table 7.1 from Options for a New Lower Thames Crossing (DfT, May 2013a)

5.4.49 The Options for a New Lower Thames Crossing (DfT May 2013a) report was presented for a non-statutory public consultation in 2013.

Options for a new Lower Thames Crossing: consultation response summary (DfT, 2013b)

5.4.50 In December 2013 DfT produced a consultation response summary of the feedback received and announced that there were sufficient grounds to discard Location Option B. Further, that DfT would obtain advice on points raised during consultation in order to better understand the relative merits of Location Options A and C or C variant.

5.4.51 In summarising the various responses received, it was stated that only 5% of respondents expressed a preference for Location Option B and concerns were also highlighted that Location Option B would jeopardise the major redevelopment of the Swanscombe Peninsula, a key part of the growth strategy for the Thames Gateway area. In addition, connections to adjacent junctions and impacts on local roads, particularly the connection with the A2, were thought to be problematic. The A2 in this area is likely to be heavily congested due to existing and planned developments. The Secretary of State concluded that there were sufficient grounds to discard Location Option B and that Government should focus on the choice between Location Options A and C.

Reappraisal of the recommendations following the 2013 consultation not to proceed with Option B

5.4.52 In recognising the preliminary nature of the assessments within the study that informed the 2013 consultation, the decision not to take forward Location Option B was reassessed in 2018, as reported in the Approach to Design, Construction and Operation (Highways England, 2018), and again in preparation of this application, to determine whether changes that had arisen since 2013 would lead to a different decision.

5.4.53 Location Option B was predicted to have a significant adverse impact on committed development, in particular the Ebbsfleet Valley Development. Both the assessment in 2018 and that reported here considered the changes in planning policy, and specifically updates to local plans since 2013.

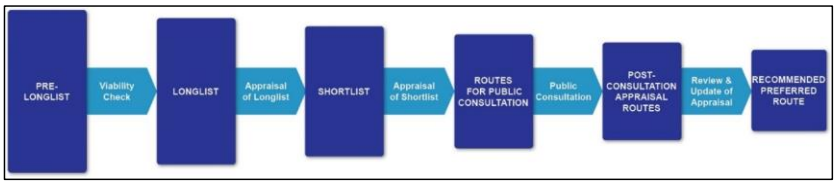
5.4.54 In 2014 the Gravesham Local Plan was adopted and in 2017 the Dartford Local Plan was adopted. In 2015 the Ebbsfleet Development Corporation became the planning authority for Ebbsfleet Garden City, the area of redevelopment of the Swanscombe Peninsula. These updated Local Plans reinforce the strategic nature of this site. In 2020, Dartford consulted on a developing new local plan. This was additionally reviewed, and the sites' remained strategically important with no significant reduction in the planned development in this area. Accordingly, the decision not to take forward Location Option B remains valid.

2016 route consultation

Route development and longlist appraisal

5.4.55 Since 2014, the Project has been taken forward by National Highways. A set of Scheme Objectives was agreed with DfT, as described in Table 5.5. A series of potential route options was developed, at potential Location Options A and C, followed by a staged approach to the appraisal process as shown in Plate 5.2 below.

Plate 5.2 Overview of options, identification and selection process



5.4.56 In 2014 a more detailed assessment of Location Options A and C commenced, as reported in the Pre-Consultation Scheme Assessment Report (Highways England, 2016). This study resulted in the identification of a series of potential alignment options, all following the general route corridors defined by Location Option A and Location Option C. There was a three-stage appraisal in order to develop these potential route options to identify the shortlist and ultimately a proposed route. These stages were the pre-longlist, longlist and shortlist.

5.4.57 At the pre-longlist stage a series of potential route options were developed within each corridor. Each potential route option was then checked for viability, considering technical feasibility and a high level appraisal against the Scheme Objectives. Potential route options that were identified as viable were carried forward into a longlist, for assessment against the Scheme Objectives.

5.4.58 In addition, the understanding gained through the viability check was used to provide a further set of potential route options, developed by combining elements from the pre-longlist potential route options, and also by modifying elements of the potential route options to account for constraints.

5.4.59 The pre-longlist included 16 potential route options within the Location Option A corridor, and one further modification that could be made to M25 junction 30 to enhance the performance of the other potential options (Plate 5.3). The potential route options included a selection of bored tunnel, immersed tunnel and bridge solutions, with associated infrastructure to connect into the SRN. A total of six potential options were identified within the Location Option C route.

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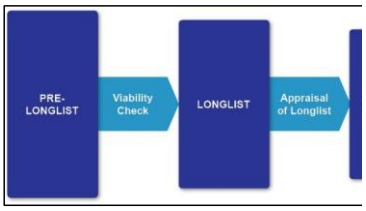
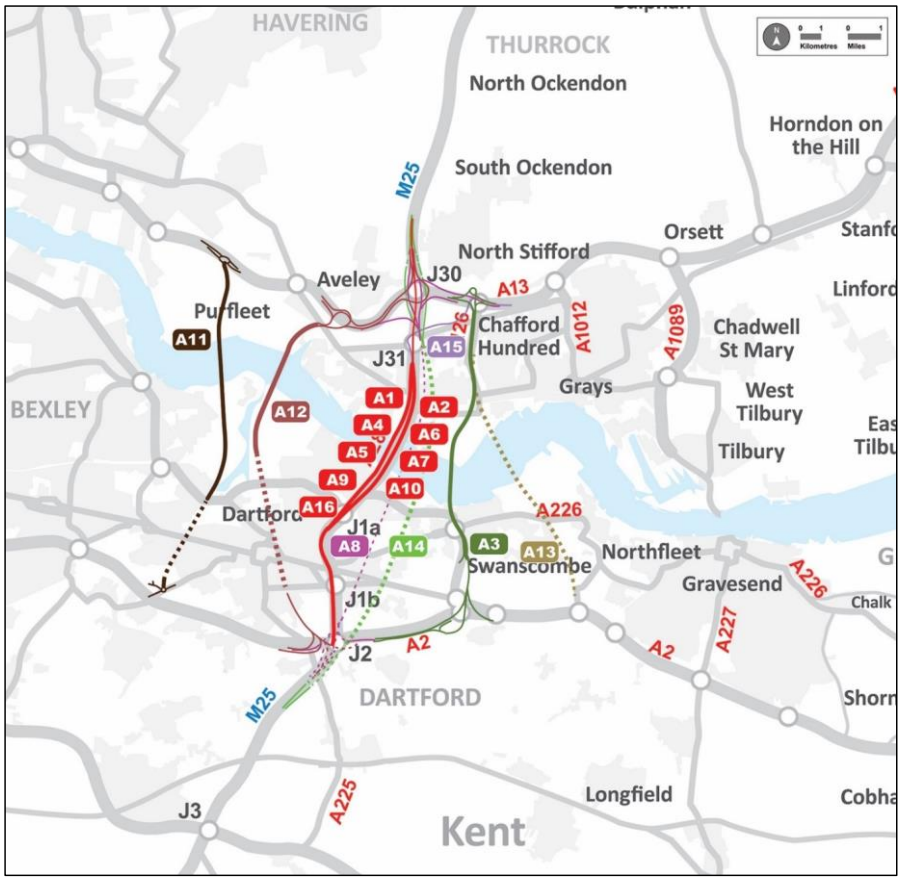
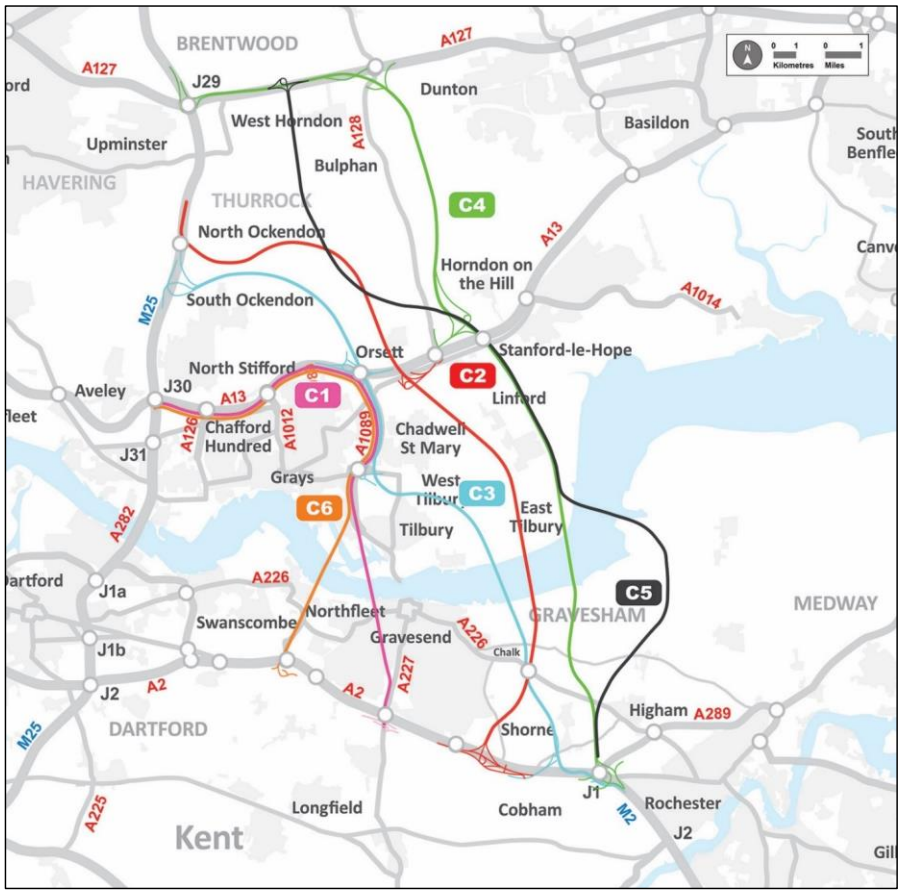


Plate 5.3 All route options within the Location Option A corridor



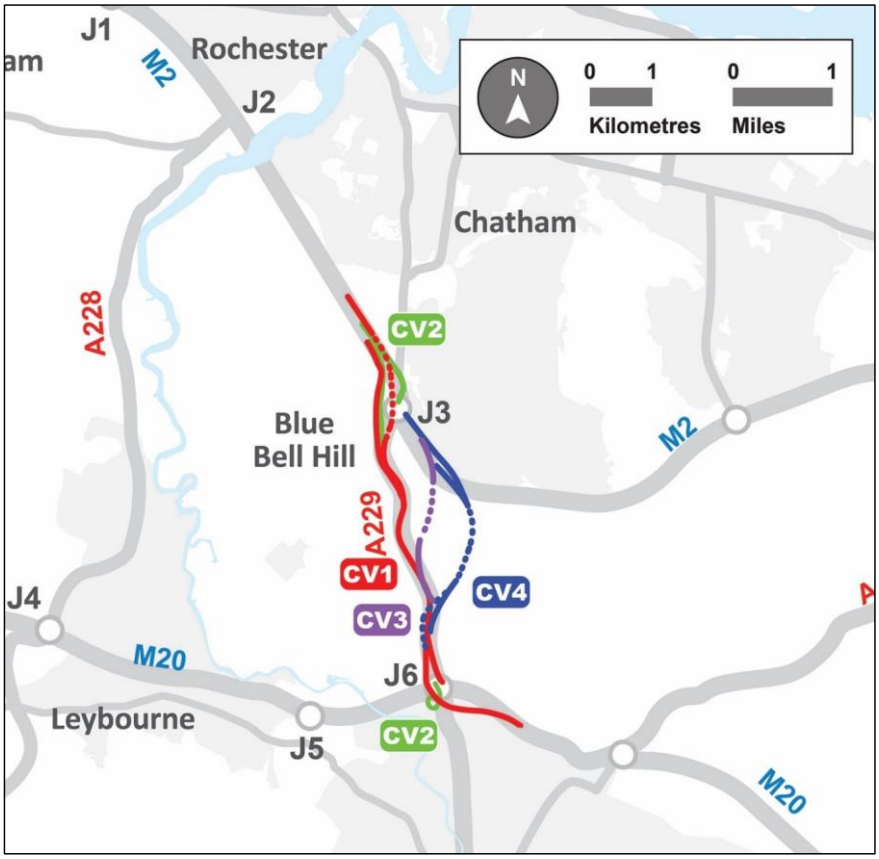
5.4.60 The six potential route options for Location Option C were presented as shown within Plate 5.4. Again, these options included a selection of bored tunnel, immersed tunnel and bridge solutions.

Plate 5.4 All main route options within the Location Option C corridor



5.4.61 A further four potential options were identified within the C variant Location Option. The C variant options do not provide an alternative for the proposed route, as they constitute an extension of the proposals to connect the M2 to the M20. The assessment of the C variant options considers whether the inclusion of one of the C variant options could provide additional benefits. All route options assessed within the C variant Location Option corridor are presented within Plate 5.5.

Plate 5.5 All route options within the C variant Location Option corridor



5.4.62 An initial viability check was then undertaken considering technical feasibility and a high level appraisal against the Scheme Objectives. This resulted in the recommendation that eleven options should not be considered further, nor included in the longlist as shown in Table 5.6.

Table 5.6 Potential route options not selected for longlist

Potential route option	Key reason for decision
A3	High cost and complexity of construction directly impacting access to Bluewater and Lakeside shopping centres, and impact on the new Eastern Quarry housing development
A5	Technically not-viable; insufficient space to create effective connections to existing roads
A6	Significant adverse impact on existing development north and south of the river, east of existing crossing
A7	Significant adverse impact on existing development north and south of the river, east of existing crossing
A10	Significant adverse impact on existing development north and south of the river, east of existing crossing
A11	Does not resolve the strategic traffic problem; too far from Dartford and too close to proposed Transport for London Belvedere crossing (no longer being progressed)
A13	Impact on new development (London Resort Company Holdings site and Ebbsfleet Garden City) along with planned developments within the emerging new Local Plan for Dartford (which was reviewed more recently in 2020). These reviews reconfirmed the scale of the impact these options would have on local development in the area
C5	Significant environmental impacts as the route had direct and unavoidable impacts as it passed through the North Kent Marshes Special Protection Area (SPA) and Ramsar site at Cliffe Pools (RSPB)
C6	Technical non-viability due to insufficient space to effectively connect to A2 and impact on new development (Ebbsfleet Garden City)
CV3	Impact on Blue Bell Hill village and construction impact at M2 junction 3
CV4	Significant environmental impact and high cost of the solution compared to alternative C variant solutions CV1, CV2; this option would necessitate a new road alignment through the Kent Downs AONB.

5.4.63 Two potential route options, A5 and C6, were found to be not technically viable. The remaining potential route options that were not taken forward, A3, A6, A7, A10, A11, A13, C5, CV3 and CV4, failed to achieve one or more of the Scheme Objectives.

5.4.64 As identified in the Potential route options CV3 and CV4 were not taken forward to the long list appraisal because of the impacts of the options from an environmental and social perspective.

5.4.65 The outcome of the viability check is detailed in Table 5.7.

Table 5.7 Viability check – summary of outcomes

Location	Options not taken forward to longlist appraisal	Taken forward for further assessment
A	A3, A5, A6, A7, A10, A11, A13	A1, A2, A4, A8, A9, A12, A14, A15, A16
C	C5, C6,	C1, C2, C3, C4
C variant	CV3, CV4	CV1, CV2

5.4.66 Following this viability check, elements of the potential Location Option C routes were used to create a further 13 combination solutions along the Location Option C corridor which were added to the longlist: C7 through to C19 (Plate 5.6, Plate 5.7, Plate 5.8, and Plate 5.9). This process allowed for the refinement of the potential route options to carry forward elements of a potential route option that had otherwise been discounted as a result of an issue with one particular aspect.

Plate 5.6 Combination option C7

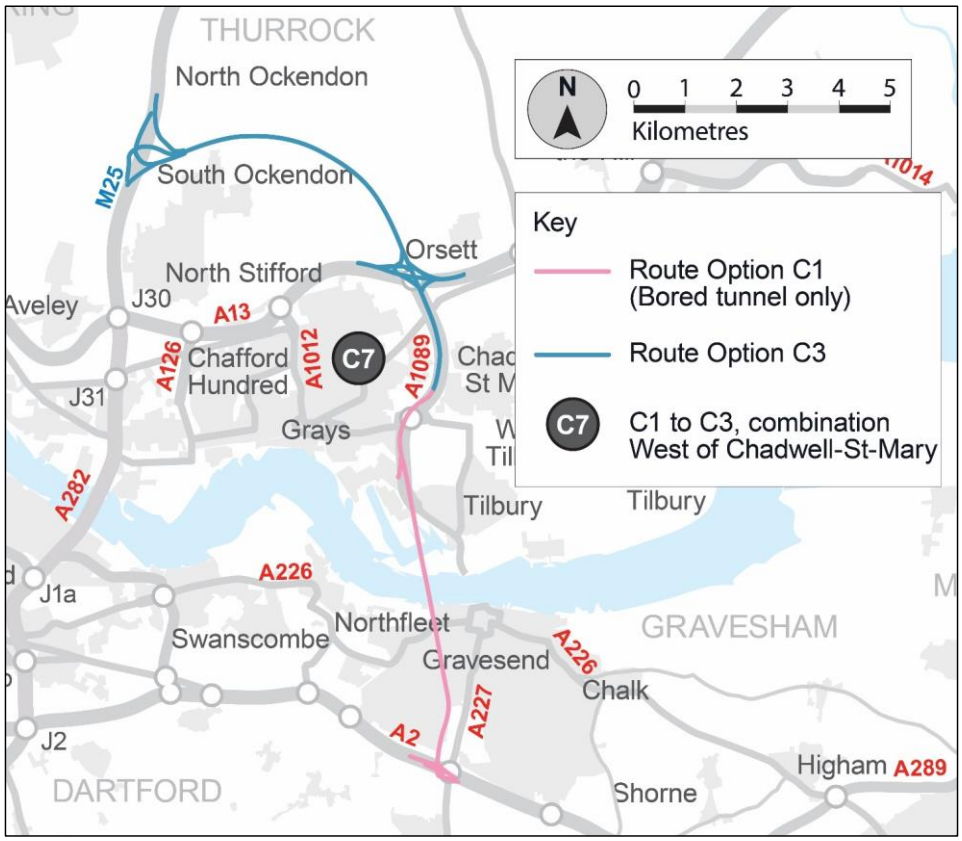


Plate 5.7 Combination options C8, C9 and C10

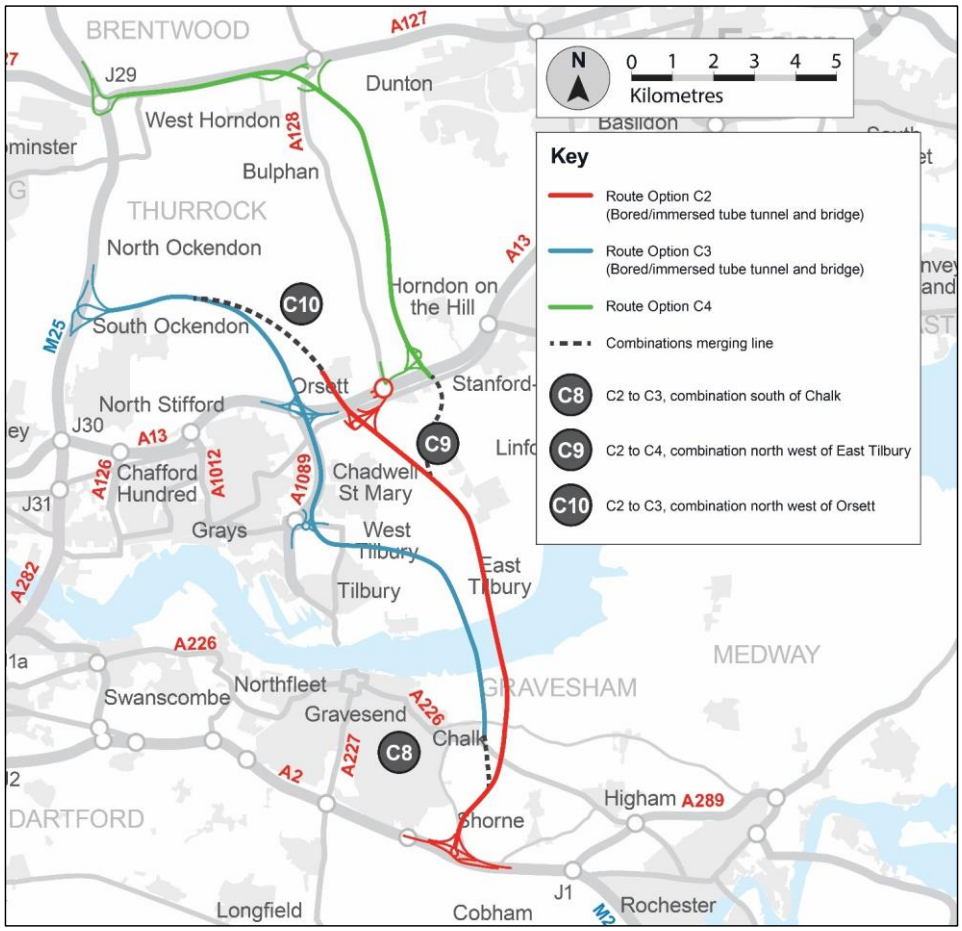


Plate 5.8 Combination options C11, C12, C13 and C14

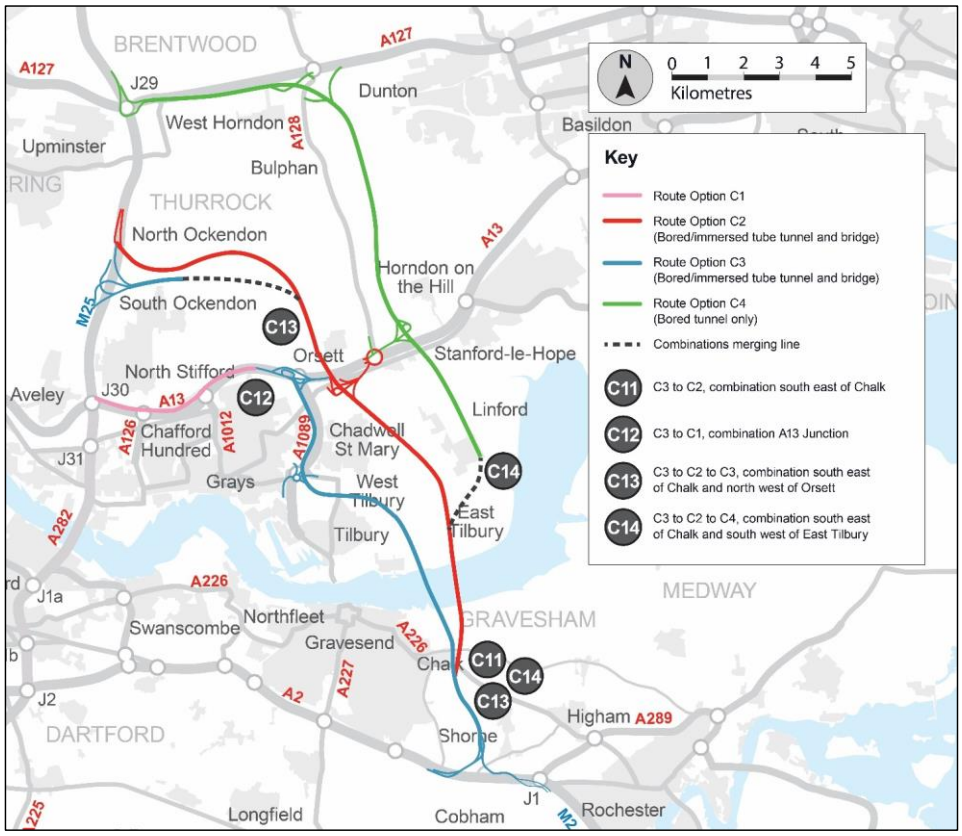
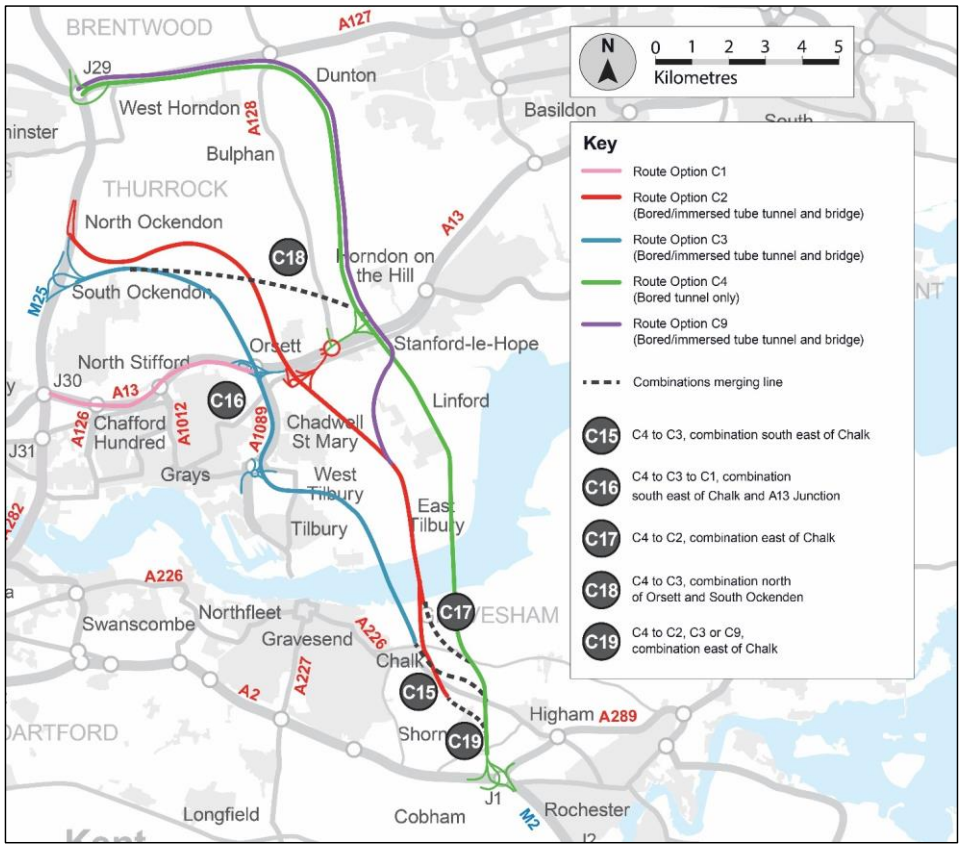


Plate 5.9 Combination options C15, C16, C17, C18 and C19



5.4.67 The longlist options were appraised in two phases. During the first phase the options were considered on the grounds of:

a. Value for money (cost against economic benefit)

b. Significant environmental impact

c. Other significant impacts (e.g. congestion, network resilience, impact on planned or existing developments)

5.4.68 When undertaking the appraisal, consideration was given to the policies outlined in the NPSNN (largely contained within Section 5 of the NPSNN on Generic Impacts). Information was gathered through consultation and engagement with key stakeholders including: Statutory Environmental Bodies (SEBs); Port of London Authority; Royal Society for the Protection of Birds (RSPB); DP World; and the Kent Downs AONB. This has also provided valuable detail about other projects undertaken in the area, the challenges they have faced and the solutions developed.

5.4.69 The assessment of potential route options involved consideration of a suite of issues (having regard to the significance of impacts, performance against the Scheme Objectives, stakeholder input and wider Government policy). This involved a comparison of the benefits of each option against the adverse impacts it would cause (and the significance of those impacts). This approach acknowledged the provisions within the NPSNN which recognises that, while applicants should deliver developments in accordance with Government policy in an environmentally sensitive way, including considering opportunities to deliver environmental benefits, some adverse local effects of development may remain. Such adverse impacts would need to be weighed against the benefits. Table 5.8 shows the long list of options deselected and the justification.

Table 5.8 Longlist Route Options not selected at the first stage appraisal

Route Option	Key reason for decision
A8 – Long tunnel junction 2 to junction 30	Cost approximately more than twice A1. Very complex junctions required to connect A2 and A13 traffic with significant impact on existing property.
A12 – Western Route junction 2 to junction 30 tunnel under Dartford with bridge over river	Cost approximately three times A1. Poor economic benefits, significant impact on planned development at Purfleet. Potential impact on a SSSI.
A14 – Long tunnel south of junction 2 to north of junction 30	Cost approximately more than twice A1. Poor level of economic benefit due to limited attraction of traffic.
C3	The 2016 assessment did not select the section of C3 on the south side of the River Thames, on the grounds of environmental impacts on an AONB, SSSI and ancient woodland, and that a reasonably practicable alternative was available comprising the section of C2 located south of the River Thames. C3 was modified to reduce the identified adverse impacts and considered further as the C8 potential option.

5.4.70 Combination options which were contingent upon the route of options that were discarded at this stage were also not taken forward past this stage. Following this first stage appraisal three route options, along with the section of Route Option C3 south of the River Thames connecting to the A2, were not considered viable resulting in combination options C11 to C14 not being selected.

5.4.71 In the second stage longlist appraisal, a comprehensive set of criteria, aligned to the Scheme Objectives, was adopted. Through this longlist appraisal, certain options were identified that failed to deliver against the Scheme Objectives. These options were not taken forward for further assessment. The result of this appraisal was a shortlist of routes for further assessment (described in further detail later in this section). Table 5.9 shows the potential route options that were not selected following the second stage of the longlist appraisal.

Table 5.9 Appraisal of longlist – options not taken forward to shortlist appraisal

Route option	Key reason for decision
A2	Limited benefits from travel time savings or congestion relief compared to capital cost). Significant impact on commercial property north and south of the river, east of existing crossing (impact on current/planned infrastructure). Impact on SSSI (biodiversity).
A9	High technical risks, significantly more difficult to construct than other options (practical feasibility). Impact on river/jetty operations unlikely to be acceptable to owners/operators or Port of London Authority (PLA) (impact on current/planned infrastructure and construction disruption).
A15	Significant impact on commercial property around junction 31 (impact on current/planned infrastructure). Major high voltage overhead cable diversions required (construction disruption and implementation timetable).
A16	Reduces value for money compared to the C option on its own. High cost solution with limited additional economic benefits (high capital cost and limited benefits from travel time savings or congestion relief).
C1	Low value for money (high capital cost, low benefits from travel time savings). Poor resilience due to use of A13 (resilience). Potential impacts on Tilbury Docks from tunnelling under existing structures (impact on current/planned infrastructure).
C4	High cost (capital cost). Impact on scheduled monuments (historic environment). There are better, lower cost options available.
C variant options CV1 and CV2	C variant has negligible effect in transferring M20 traffic from existing Dartford Crossing onto a new crossing at Location C. Significant impact on AONB (biodiversity and landscape). High capital cost (capital cost). Does not bring traffic and economic benefits that materially add value to the Project.

5.4.72 As previously, combination options which were contingent upon the potential route options that were discarded at this stage were also not taken forward past this stage.

a. Combination option C7 was not selected as it included the section under the Tilbury Docks. This section was significant in the decision not to take forward potential Route option C1 and is also the reason for not selecting option C7.

b. Combination option C15 was not selected as it had a similar route south of the river to combination option C19 which was selected for the shortlist. It was considered that the combination option C19 was preferable as it was further from Shorne Woods Country Park.

c. Combination option C16 was not selected as it included a section of potential Route option C1 that included the A13. It failed, therefore, to meet the Scheme Objective of relieving the congested Dartford Crossing.

d. Combination options C17 and C18 were not selected as they included sections of potential Route option C4 that impacted on Coalhouse Fort.

5.4.73 Combination option C10 comprised a modification to potential Route option C2 amending the route between the A13 and the M25 and providing both northbound and southbound connections onto the M25. This option was considered insufficiently different to potential Route option C2 in terms of the overall design and the ability to meet the Scheme Objectives and, therefore, this option was not carried forward, as this could be considered later as design development if C2 was selected to be the preferred route.

5.4.74 The following combination options were used to modify other options enabling them to be carried forward into the shortlist appraisal:

a. Combination option C8 comprised a modification to potential Route option C3 south of the River Thames, avoiding Shorne Woods Country Park by moving the route to the west, corresponding with the potential Route option C2. This option was adopted as a modification to potential Route option C3, allowing that option to be carried through into the shortlist phase as Route 2.

b. Combination option C19 comprised a modification to potential route options C2, C3 or C8 south of the River Thames to avoid Shorne Woods Country Park by moving the route to the east, corresponding to the potential Route option C4. This section of the route, south of the River Thames and renamed the Eastern Southern Link, was adopted as a modification to potential Route options C2 and C3, enabling those potential route options to be carried through into the shortlist phase.

c. Combination option C9 comprised the southern section of potential Route option C2 connecting to potential Route option C4 north-west of East Tilbury. This combination option was carried forward into the shortlist phase as Route 4.

5.4.75 Following the longlist appraisal stage, several options were identified and were carried forward into the shortlist stage. The outcome of the longlist appraisal is detailed in Table 5.10.

Table 5.10 Appraisal of longlist – summary of outcomes

Location	Eliminated at first stage appraisal	Eliminated at second stage appraisal	Taken forward for further assessment
A	A8, A12, A14	A2, A9, A15, A16	A1 and A4 developed as Route 1
C	C11, C12, C13, C14 Elements of C3 were used to develop C8	C1, C4, C7, C10 C15, C16, C17, C18	C8 developed as Route 2 C2 developed as Route 3 C9 developed as Route 4 C19 was taken forward as a modification to C4 south of the River Thames and developed as the Eastern Southern Link The Western Southern Link comprised the unmodified sections of C2 south of the River Thames.
C variant	None	CV1, CV2	None

5.4.76 These options were renamed for clarity, as detailed in Table 5.11 and Plate 5.10. The options were simplified by defining a single route for the crossing for Routes 2, 3 and 4, and defining two specific routes south of the River Thames, the ESL and WSL. For each of Routes 2, 3 and 4, the three crossing options were considered: a bridge, a bored tunnel and an immersed tunnel. Route 1 was also considered with a single crossing location, and for both a bridge and a bored tunnel crossing.

Table 5.11 Options selected for appraisal of shortlist

Shortlist route	Previous reference
Route 1 with bridge	A1
Route 1 with bored tunnel	A4
Route 2 with WSL and bridge	C3 modified by C8
Route 2 with WSL and bored tunnel	C3 modified by C8
Route 2 with WSL and immersed tunnel	C3 modified by C8
Route 2 with ESL and bridge	C3 modified by C8 and C19
Route 2 with ESL and bored tunnel	C3 modified by C8 and C19
Route 2 with ESL and immersed tunnel	C3 modified by C8 and C19
Route 3 with WSL and bridge	C2
Route 3 with WSL and bored tunnel	C2
Route 3 with WSL and immersed tunnel	C2
Route 3 with ESL and bridge	C2 modified by C19
Route 3 with ESL and bored tunnel	C2 modified by C19
Route 3 with ESL and immersed tunnel	C2 modified by C19
Route 4 with WSL and bridge	C9
Route 4 with WSL and bored tunnel	C9
Route 4 with WSL and immersed tunnel	C9
Route 4 with ESL and bridge	C9 modified by C19
Route 4 with ESL and bored tunnel	C9 modified by C19
Route 4 with ESL and immersed tunnel	C9 modified by C19

Plate 5.10 Shortlisted routes

Reappraisal of the recommendations in the 2016 study to shortlist Routes 1, 2, 3 and 4

5.4.77 Although further developed than earlier assessments, the potential route options developed in 2016 remained at an early stage of development. As a result, the decision to shortlist Routes 1, 2, 3 and 4 was reassessed in 2018, as reported in the Approach to Design, Construction and Operation (Highways England, 2018), and again in preparation of this application, to determine whether changes that had arisen since 2016 would lead to a different decision.

5.4.78 The findings of the reappraisal of the location A options are shown in Table 5.12.

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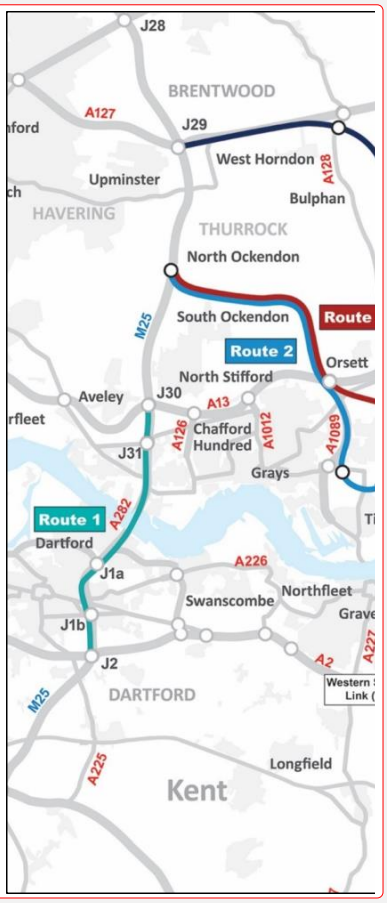

Table 5.12 Location A option reappraisal

Check or review	Outcome
Viability check	Potential Route options A3, A6, A7, A10 and A13 were not taken forward as they conflicted with existing infrastructure and other developments. The infrastructure and developments that resulted in these conflicts remains in place. Potential Route option A5 was not taken forward as it was not technically viable to provide connections to the existing roads, and this remains the case. The A11 potential route option had not been taken forward as it did not solve the strategic traffic problem. As the potential route option required traffic to travel a significant distance along the A2 and A13 from the M25, it did not provide a strategic route. The decision not to take this potential route option forward is considered to remain valid. The decision not to take forward potential Route options A3, A5, A6, A7, A10, A11 and A13 remains valid.
Longlist review	Potential Route options A2, A9 and A15 were not taken forward as they conflicted with existing and planned infrastructure and other developments. The emerging new Local Plan for Dartford, along with the existing Local Plan for Thurrock, were reviewed against the options. These reviews reconfirmed the scale of the impact these options would have on local development in the area, and consequently the decision not to take these options forward remains valid. Potential Route option A14 was not taken forward because it did not provide connectivity with the A2 or the A13 and as a result only attracted limited volumes of traffic. It would therefore not meet the Scheme Objective of relieving the congested Dartford Crossing. Following comments received during the non-statutory consultation this option was reappraised, prior to the selection of the preferred route, validating the decision not to take it forward to the shortlist stage. In 2018 this option was remodelled following development of the 2016 traffic baseline. The lack of connectivity with the A2 and A13 continues to limit the relief this solution would provide for the congested Dartford Crossing. As such, the decision not to take potential Route option A14 forward remains valid. Potential Route option A8 was an attempt to provide a similar solution to potential option A14, while including the important connectivity with the A2 and the A13. Making these connections would require significant remodelling of the existing road network. At the A2, existing developments and road layout would prevent the provision of a connection with the A2 westbound, one of the most important connections to achieve the Scheme Objective of relieving the congested Dartford Crossing. The potential Route option A12 had not been taken forward because of high construction costs while delivering poor economic benefits, as well as impacts on local development and potential impacts on an SSSI. The emergent Local Plan for Dartford was reviewed. As there were no changes to the assumptions leading to this decision, the decision not to take the A12 potential route option forward remains valid. Potential Route option A16 comprised a two-lane northbound tunnel in conjunction with a solution at Location C. The northbound tunnel at Location A presented similar challenges to the other potential route

Check or review	Outcome
	options considered at Location Option A, including conflicts with existing infrastructure and development. As with the other solutions at Location Option A, these issues were reviewed in 2018 and again for this reappraisal and the conflicts remained. Consequently, the decision not to take A2, A8, A9, A12, A14, A15 and A16 options forward remains valid.

5.4.79 The findings of the reappraisal of the location C options are shown in Table 5.13.

Table 5.13 Location C option reappraisal

Check or review	Outcome
Viability check	Potential Route option C5 was located further to the east than the other options, and therefore had a more significant impact on the Ramsar site. Again, as alternatives that would have a lesser impact on the Ramsar site exist, this solution was considered to be inappropriate having regard to the Conservation of Habitats and Species Regulations 2017. Potential Route option C6 had not been taken forward as it failed to meet the Scheme Objectives due to the impact on Ebbsfleet Garden City. This potential route option was reappraised against the spatial allocations in the relevant updated Local Plans, and the situation has not changed.
Longlist review	Potential Route option C1 was not taken forward due to the impacts on local commercial developments and infrastructure resulting from their construction, and due to the reliance on the A13. This option was reappraised against the spatial allocations in relevant updated Local Plans, and the situation has not changed. Compared to the proposed Project alignment, this option presented a substantial conflict with existing and planned residential and commercial developments in Tilbury, Grays and Chadwell St Mary, so consequently the decision not to take this solution forward was validated. Combination options that were based on potential Route option C1 were also discarded, including C7, which passed underneath the Port of Tilbury, and C16, which included the A13. The decision not to take these potential route options forward remains valid, for the same reason as the decision not to take forward potential Route option C1. Potential Route option C4 was not taken forward as it had a high cost, and it impacted on a scheduled monument (Coalhouse Fort). These concerns remain, and so the decision not to take it forward remains valid. Sections of potential Route option C4 located further to the north than Coalhouse Fort were used to develop potential Route option C9, while the section south of the River Thames was used to develop potential Route option C19. Combination options that were based on potential Route option C4 were also discarded, including C17 and C18. The decision not to take these options forward remains valid, for the same reason as the decision not to take forward C4. Combination option C15 was not taken forward as it was similar to C19 but located closer to Shorne Woods Country Park. This remains the case, and as such the decision not to take this option forward remains valid. The section of C3 located south of the River Thames had adverse environmental impacts and a reasonably practicable alternative with

Check or review	Outcome
	lower impacts was available. In addition, combination options C11, C12, C13 and C14 used the same section of potential Route option C3 south of the River Thames connecting to the A2. There has been no change to the areas that would have been impacted, and so the decision not to take forward C11, C12, C13 and C14, and to take forward C3 refined by C8, rather than the full C3 Route remains valid. Potential Route option C10 was a modification to C2, and it was considered that the modification would be a matter for later design development if C2 were selected, and as such the decision not to take C10 into the next stage was appropriate.

5.4.80 The C variant options do not provide an alternative for the proposed route, as they constitute an extension of the proposals to connect the M2 to the M20, and so the assessment needed to consider whether the inclusion of one of the C variant options could provide additional benefits. The findings of the reappraisal of the location C variant options are presented in Table 5.14.

Table 5.14 Location C variant option reappraisal

Check or review	Outcome
Viability check	Options CV3 and CV4 were not taken forward due to the significant adverse impacts on the environment, as they would both necessitate the construction of a new road alignment directly within the Kent Downs AONB designation. The C variant options are not a project alternative, rather they provide an opportunity to provide additional benefits by extending the proposed alignment. As such, the C variant options should be considered against each other, and not against the full project alignment. As there is no change to the impacts associated with these options, the previous decision not to take these options forward remains valid as CV1 and CV2 provide lower impact solutions.
Longlist review	A more detailed appraisal was undertaken of the C variant options CV1 and CV2 which had not been taken forward because the traffic model showed that they failed to meet the Scheme Objectives by failing to relieve the congested Dartford Crossing. The performance of this option was reviewed using the information from the 2016 traffic baseline and the traffic forecasts. While the Project's transport model shows that there would be increases in traffic flows along the M2 and A229, as reported in Appendix C: Transport Forecasting Package of the Combined Modelling and Appraisal Report (Application Document 7.7), increasing the capacity along this route would still fail to relieve the congested Dartford Crossing. Consequently, the decision not to take forward the C variant options was considered to remain valid.

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5.4.81 In summary, the reappraisal determined that the process of refinement and modification that resulted in the shortlisted routes undertaken in 2016 remains valid in light of the newly available information about the area and the traffic flows.

Developing the shortlisted routes for public consultation

5.4.82 The shortlisted potential route options were developed further and assessed in order to determine the routes to be set out in the 2016 Route Consultation, including a recommended route.

5.4.83 The detailed appraisal identified that Route 1 did not meet the traffic-related Scheme Objectives, as it did not provide an alternative route. The completed option would still be subject to a 50mph speed limit, and it performed poorly when appraised for the safety, noise and air quality impacts. In addition, the Lower Thames Crossing Pre-Consultation Scheme Assessment Report (Volume 7) (2016) undertaken by Highways England highlighted that Route 1 would have significant drawbacks from a deliverability perspective, as both the tunnel and bridge options would have significant impacts for road users, with traffic management being required throughout the 80 month construction phase (including diversions, speed limits and contraflow working). Delays to user journeys also has an economic cost. Capacity at the existing crossing would be reduced during construction for a prolonged period imposing delays on existing users of the crossing and in effect negating some of the time benefits realised through the introduction of Dart Charge. The complexity of the works and the constraints imposed by working within the existing M25/ A282 corridor would mean that some work would need to be carried out at night. However, working at night close to existing properties along the A282 would be constrained by restrictions on noise and vibration. Alongside air quality impacts over the construction phase, the economic disbenefits of time lost due to delays during construction was estimated to be around £300m for this route.

5.4.84 Route 1 also offered substantially lower benefits than location C options. As a result, it was concluded that it was not viable and should not be presented as a potential option.

5.4.85 The proposed proximity of a crossing at Location C to the Thames Estuary and Marshes SPA and Ramsar site was a fundamental consideration to the development of the project and the selection of the crossing type. An HRA Screening Matrix for the longlist of options with the potential to have significant effects on European sites was, therefore, issued to Natural England for comment and it was agreed that a Part One Appropriate Assessment Report should be prepared to inform the shortlist appraisal and the decision-making process.

5.4.86 Detailed appraisal of each of the shortlisted options was undertaken using the framework of the defined Scheme Objectives. These routes were further developed and refined as part of this process. This refinement was informed by more detailed information and discussion with stakeholders. Alongside environmental impacts, this appraisal also had regard to a wide range of strategic, economic, management, financial and commercial criteria. These included a detailed consideration of factors such as revenue costs, operation/maintenance, air quality, travel time savings and (at a strategic level) fit with wider transport and government objectives (among various others).

5.4.87 The detailed appraisal identified that at Location C both the bridge and immersed tube crossing solutions would entail a risk of significant effects to the Thames Estuary and Marshes, a statutory designated site protected under the Ramsar convention and the Conservation of Habitats and Species Regulations

2017. The bored tunnel was therefore considered the only viable crossing option for Routes 2, 3 and 4 and the ESL/WSL, as it met the Scheme Objectives and was assessed as having lesser effects on the designated site compared to the other crossing options. As a result, only the bored tunnel solution was taken forward at Location C.

5.4.88 The outcome of the shortlist appraisal is detailed in Table 5.15.

Table 5.15 Appraisal of shortlist – summary of outcomes

Location	Not taken forward as potential options	Taken forward as potential options
A	Route 1 with a bridge Route 1 with a bored tunnel	None
C	All solutions with a bridge or an immersed tube tunnel	Routes 2, 3 and 4, with a bored tunnel crossing, and including either the ESL and WSL south of the River Thames.

Public consultation

5.4.89 Routes 2, 3 and 4 north of the River Thames, and the WSL and ESL south of the River Thames, connected by a bored tunnel, bridge or an immersed tube tunnel at location C, east of Gravesend and Tilbury were presented at the non-statutory public consultation, which was held between January and March 2016. The consultation also included information on those routes that were not considered viable. Notably, it was indicated at this stage that for the reasons outlined above, Location A (Route 1) was not considered viable for the following reasons:

a. It would not provide network resilience.

b. It would lead to increased congestion on the adjacent A2 and A13.

c. Construction would take at least six years, with 40mph average speed restrictions, significant disruption and complex traffic management.

d. The current 50mph speed limit and closely spaced junctions would remain following completion.

5.4.90 The consultation materials appraised Routes 2, 3 and 4 against the Scheme Objectives, and provided the recommendation that Route 3 was considered best to meet the transport-related Scheme Objectives of providing free-flowing north–south capacity, improving network resilience and improving road-user safety.

5.4.91 With regards to crossing design, the bored tunnel option was concluded to be the least damaging of the three engineering solutions as it would avoid direct habitat loss from European sites and would have minimal construction impacts. The bridge option would give rise to significant impact over both the construction and operational phases including collision risk, shading and lighting alongside direct habits loss.

5.4.92 The ESL provided a standard free-flowing junction with the A2/M2, while the WSL provided for a compact junction with speed restrictions. While it was recognised at this stage that both the ESL and WSL would meet the Scheme

Objectives, the proposed scheme in January 2016 recommended the ESL and invited comment on this scheme and the other routes.

5.4.93 After the consultation, the responses were considered carefully, as reported in the Lower Thames Crossing Consultation – Analysis of findings report (Ipsos MORI, 2017).

5.4.94 Ultimately, Route 3 (with a bored tunnel river crossing) was preferred over Route 4 because it had fewer impacts on designated sites and was a shorter, lower cost option which could be designed to modern highway standards over its whole length, therefore providing the highest quality of solution of the three routes. Route 3 was preferred over Route 2 as Route 2 would be closest to existing urban areas, and by utilising a section of the A1089 would require challenging works and lead to mixing of local and long distance traffic.

5.4.95 Route 2 received little support over the 2016 consultation. Route 3 received the highest proportion of support (33%) from the public (10,591). This was reflected in responses from the rest of Essex and Kent, the adjoining London boroughs and the rest of the UK. Route 3 also had greater support from members of the public and groups and organisations than Route 4.

5.4.96 Some respondents expressed strong concerns about the significant impacts of the Eastern Southern Link on greater numbers of communities, properties and protected environmental sites including the Kent Downs AONB, while reasons provided in favour of the Western Southern Link were that it minimised impacts on communities and the environment.

Development of the preferred route

5.4.97 The Secretary of State announced the preferred route in April 2017. To support the decision, a report was published at the announcement (Post-Consultation Scheme Assessment Report, Highways England, 2017a). The report set out a further review and assessment of the routes undertaken following the consultation.

5.4.98 Three routes were identified for further consideration, post consultation. The consultation confirmed the finding of the pre-consultation process, that Route 2 had significant adverse impacts on road safety on the A1089 and was not supported by the public or key stakeholders. However, there was significant interest in the potential for Route 1 to deliver against the Scheme Objectives. Consequently, following the consultation, Route 2 was discounted from further consideration and Route 1 was brought into the post-consultation appraisal.

5.4.99 Those selected included the two routes presented at the 2016 Route consultation that were most strongly supported (Routes 3 and 4), as well as further appraisal of Route 1 at location A. Although Route 1 had been assessed as not viable during the pre-consultation appraisal process, having regard to consultation responses received, it was concluded that Route 1 should be appraised in more detail. Routes 1, 3 and 4, were reviewed and updated taking account of the feedback from the consultation and using new or revised information where appropriate. This review resulted in the development of the preferred route.

5.4.100 Route 2 was not appraised further after the route options consultation for several reasons. It was not supported at consultation by the public or by key statutory bodies due to the potential impacts on the environment and on local communities. In addition, there were safety issues with the section of the route that followed the existing A1089 alignment.

5.4.101 Route 1 was again assessed as not meeting the Scheme Objectives, and the conclusions that it should not be taken forward remained valid. The reassessment confirmed that:

a. Route 1 could not be developed as a free-flowing 70mph solution, as the crossings and approaches would be restricted to 50mph.

b. As traffic would still be funnelled through the existing M25/A282 corridor between junction 2 and junction 30, it would not provide resilience on the network.

c. Despite lower costs than the preferred route, it delivered lower value for money as the economic benefits were substantially smaller.

d. The additional traffic through the existing corridor would exacerbate existing air quality problems and lead to an overall noise disbenefit.

5.4.102 Route 4 was assessed as having higher environmental impacts than Route 3, including on areas of ancient woodland and local wildlife sites, and impacted a registered park and garden. In addition, Route 4 was longer than Route 3, and had higher costs with similar economic benefits resulting in lower value for money. Route 3 had greater support from members of the public and groups and organisations than Route 4.

5.4.103 Whilst there was support for the ESL during public consultation, stakeholders (including local authorities and statutory environmental bodies) highlighted the environmental and community concerns. Further work was undertaken to review the junction between the WSL and the A2, and a revised design was developed that could provide the same free-flowing 70mph connection as the ESL. As a result, it was concluded that the modified WSL would best meet the Scheme Objectives, achieving the transport objectives, offer higher value for money and would fully support wider regeneration and economic objectives, while having a materially lower impact than the ESL on the environment and local communities.

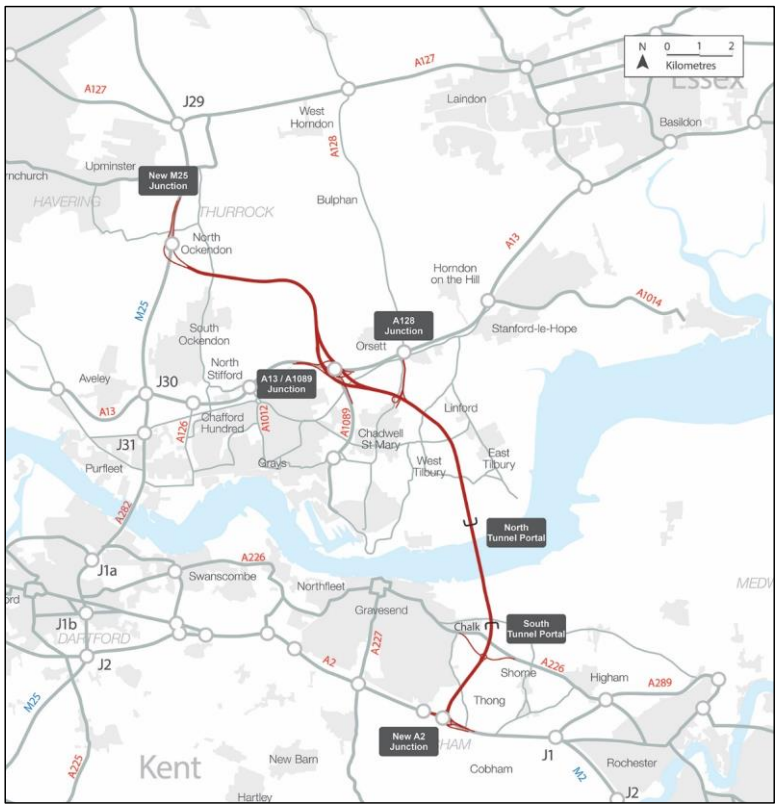
5.4.104 The assessment determined that a bored tunnel crossing would be the only option at Route 3 that would not directly affect the Thames Estuary and Marshes Ramsar site and SPA. Both a bridge and immersed tunnel would result in direct loss of habitat in relation to the southern end of the approaches to the crossing. While the proposed alignment was for a dual two-lane solution, the recommendation was that the tunnel should be sized to provide dual three-lane capacity to future-proof the infrastructure.

5.4.105 These considerations informed the decision that the preferred route should constitute Route 3 with the Western Southern Link, modified to allow a free-flowing 70mph junction with the A2.

The preferred route

5.4.106 The Secretary of State announced the preferred route in April 2017 (Plate 5.11).

Plate 5.11 The preferred route announced in April 2017



5.4.107 The preferred route was Route 3 north of the River Thames; a future-proofed twin-bored tunnel crossing of the river, large enough to accommodate a dual three-lane carriageway; and the WSL south of the River Thames.

Reappraisal of the Preferred Route Announcement – Route 1

5.4.108 Route 1 was discounted in 2017 as it failed to achieve the traffic-related Scheme Objectives. Following the selection of the preferred route in 2017, a new transport model has been developed, the Lower Thames Area Model, based on a revised traffic baseline in 2016. As the assessment of Route 1 related to traffic matters, a reappraisal has been conducted to verify whether the previous determination was correct.

5.4.109 To support this assessment of Route 1, in 2018 the route was remodelled using the LTAM. LTAM used updated traffic data from mobile phone data and more recent, 2016, traffic counts and showed an increase in the volume of traffic between M25 junction 1a and junction 3, when compared to the model used to

support the PRA. In 2022, Route 1 was again modelled using LTAM, with the same forecast developments and growth predictions as used in the model runs informing the traffic assessments reported in the Combined Modelling and Appraisal Report (Application Document 7.7). This assessment found similar results to the previous studies. An assessment of how this impacts the previously conducted appraisal on Route 1 is set out in Table 5.16. It demonstrates that Route 1 remains unviable as a solution, because it would not meet the Scheme Objectives.

Table 5.16 Summary assessment of Route 1

Scheme Objective		Route 1
Transport	Relieve the congested Dartford Crossing and approach roads and improve their performance by providing free-flowing north–south capacity	The 2017 appraisal, reported in the Post-Consultation Scheme Assessment Report (Highways England, 2017a), identified that Route 1 was an online improvement which did not increase the existing speed limit from the current 50mph, because of the constraints caused by the existing infrastructure. Closely spaced junctions would remain, with increased weaving moves due to higher traffic flows. Free-flowing north–south capacity could not be achieved with Route 1, and the new crossing would not change the overall experience for road users. The appraisal also determined that attracting more traffic into the existing corridor would increase congestion on key east–west approach roads to the crossing, such as the A2 and A13. The modelling conducted for the reappraisal has confirmed the findings at the options selection stage, particularly the issue of increasing congestion on the approach roads to the Dartford Corridor. It remains the case that Route 1 would not meet this objective.
	Improve resilience of the Thames crossings and major road network	The 2017 appraisal identified that, while Route 1 would provide additional crossing resilience, it would not improve the resilience of the wider road network and so would fail to meet this objective. Traffic would still be funnelled through the existing M25/A282 corridor between junction 2 and junction 30. The modelling conducted for the reappraisal shows that this conclusion remains valid.
	Improve safety	The 2017 appraisal identified that there would be a small increase in the overall accident rate and the FWI per billion vehicle miles if Route 1 were pursued. The existing M25/A282 corridor has a poor safety record, and with the significant increase in traffic on the route, it is likely to continue to perform poorly compared with national average rates. There would be a more complex driving environment at the Dartford Crossing with substantial weaving movements, because of the split of traffic between the two bridges and two tunnels, combined with the proximity of junctions 1a and 31. The modelling conducted for the reappraisal indicated that these adverse impacts would likely increase compared to the conclusions reached in the 2017 appraisal.

Scheme Objective		Route 1
Economic	Support sustainable local development, regional economic growth in medium to long term	The 2017 appraisal identified that direct benefits generated by route 1 are estimated to be £1.0 billion, made up principally of journey time savings. The appraisal also identified that route 1 provided limited 'Wider Impact' benefits as it would not connect new communities or areas of business growth to the road network. The 2018 reappraisal using the LTAM demonstrated a reduction of the direct benefits generated by Route 1, with direct benefits less than a quarter of the journey time benefits delivered by the Project. This outcome was confirmed in the 2022 review.
	Be affordable to Government and users	Route 1 remains a lower-cost option than the Project but does not address the problem of congestion along the Dartford Crossing corridor.
	Value for money	The 2017 appraisal identified that Route 1 represented lower value for money than the preferred route. The reduction in the generated direct benefits (following the reappraisal using LTAM) would reduce the performance of this route option further, in value for money terms.
Environment	Minimise adverse impacts on health and the environment	All relevant environmental and health effects were appraised in 2017 and reported in the Post-Consultation Scheme Assessment Report (Highways England, 2017a). Many of the existing and future predicted (opening year without the Project) exceedances of AQS objectives in the study area are around the existing M25/A282 route corridor in Dartford. In the previous options appraisal, the air quality modelling for Route 1 concluded that air quality would get worse in this area because more traffic would be attracted to the existing road corridor along the M25/A282. It was predicted that this would have led to increases in pollution where there are exceedances of AQS objectives for NO_2. The modelling conducted for the reappraisal confirmed that traffic flows would increase along the existing M25/A282 corridor because of Route 1, and therefore the findings of the options appraisal air quality modelling remain valid.

5.4.110 This reappraisal confirmed that the decision not to proceed with Route 1 was valid.

Reappraisal of the Preferred Route Announcement – Eastern Southern Link

5.4.111 Following the announcement of the preferred route, the route was developed further. A number of design changes took place leading to different impacts in the area south of the River Thames including:

a. Statutory Consultation (2018)

i. New junction design between the A122 and the A2 to allow for free-flowing 70mph connections

ii. The widening of A2 to M2, junction 1 to reduce congestion and improve traffic flow, widening the road through junction 1 of the M2 to provide four lanes rather than three and providing two additional lanes in both directions running parallel to the A2 to provide connections to the A289 and the old A2

iii. Change to three lanes rather than two

b. Supplementary Consultation (2020)

i. Introducing new utilities works and permanent easements alongside the A2/M2

c. Design Refinement Consultation (2020)

i. Reducing and refining the utilities works

d. Community Impacts Consultation (2021)

i. Further refinements to the utilities works

5.4.112 A summary description of these changes is set out in Section 5.5 with cross reference to further detail provided in the Environmental Statement Chapter 3: Assessment of Reasonable Alternatives (Application Document 6.1) and in Part G of the Project Design Report (Application Document 7.4)

5.4.113 These refinements led to an overall increase in the adverse impacts on Kent Downs AONB, on ancient woodland and on Shorne and Ashenbank Woods SSSI. As a result, in 2018, the adverse effects of the design presented at Statutory Consultation were compared against the effects of the ESL identified in the 2016 appraisal to determine whether the revised proposals now had greater adverse impacts than the previously discounted ESL. This assessment, reported in the Approach to Design, Construction and Operation (Highways England, 2018b), found that despite the increase in the impacts on landscape arising from the design changes, the overall impacts of the WSL on the AONB remain lower than the ESL, as the proposals widen an existing corridor. Development of the ESL would require creation of a new corridor, directly impacting on the AONB and the setting along the eastern boundary. While the Project, as now proposed, would increase the existing impacts on the AONB that arise from the A2, the ESL would extend the impacts to encroach on a wider area of the AONB and its setting.

5.4.114 The assessment further found that the impacts on ancient woodland and SSSI arising from the design changes would result in a similar impact as had been determined for the ESL in the 2016 assessment. However, given the revised traffic forecasts following the development of the traffic modelling, further development of the ESL would likely be required to accommodate the increased traffic, and this would likely result in a further increase to the impacts of the ESL option.

5.4.115 Following this assessment, further design and appraisal work was, therefore, undertaken on the ESL and WSL and it became apparent that there was very limited opportunity with the ESL to reduce the community and environmental

impacts on the AONB, SSSI and ancient woodland and meet the relevant provisions within the NPSNN.

5.4.116 A revised design was prepared for the ESL, that considered the capacity required for the increased traffic flows that had led to the increase in the footprint of the road along the A2/M2 and the widening for the A122 from two to three lanes. This revised design was then assessed against existing utilities to determine whether additional utility diversions would be required. This revised design was then assessed against the environmental constraints.

5.4.117 It would remain the case, following the design changes and subsequent assessments that both the WSL and ESL would impact on ancient woodland, but the reworked ESL would result in the loss of approximately 50% of Great Crabbles Wood as well as an area of ancient woodland compensatory planting. Whilst the WSL would affect Claylane Wood ancient woodland and Shorne and Ashenbank Woods SSSI, it would have a lesser overall impact than the ESL.

5.4.118 Alongside identified impacts upon ancient woodland, the further assessments also established that overall, the ESL would have a greater impact on local communities as well as cultural heritage and the Kent Downs AONB. It is anticipated that the WSL impacts on air quality and noise are worse than would be the case for the ESL (were the ESL alignment to be fully developed) due to the proximity of the WSL route to sensitive receptors.

5.4.119 The WSL would also have less impact on the Kent Downs AONB than the ESL as it would involve less of a transport footprint within the designation.

5.4.120 With regard to communities, the WSL would have a lesser impact on potential demolition of property than the ESL (four residential and three commercial properties for the WSL, compared to 10 residential and two commercial properties in the case of the ESL). In the case of the WSL, the majority of the A2 junction works would be constructed off-line, requiring less traffic management than the ESL (which would necessitate major viaducts over live carriageways and local traffic diversions).

5.4.121 An assessment of how this impacts the previously conducted appraisal on the ESL is set out in Table 5.17.

Table 5.17 Summary assessment of the updated Eastern Southern Link vs the updated Western Southern Link

Scheme Objective		ESL vs WSL
Transport	Relieve the congested Dartford Crossing and approach roads and improve their performance by providing free-flowing north–south capacity	The 2017 appraisal, reported in the Post-Consultation Scheme Assessment Report (Highways England, 2017a), identified that both the WSL and ESL (as part of a route at location C) would have a similar positive impact on reducing congestion at the Dartford Crossing. The reappraisal work undertaken showed that this remains valid.
	Improve resilience of the Thames crossings and major road network	The 2017 appraisal identified that both the WSL and ESL provide improved network resilience as part of a new and completely alternative route to the existing crossing. The reappraisal work undertaken showed that this remains valid.
	Improve safety	The 2017 appraisal identified that both the WSL and ESL would provide a new high-quality route with a high standard of safety for road users. The reappraisal work undertaken showed that this remains valid.
Economic	Support sustainable local development, regional economic growth in medium to long term	The 2017 appraisal identified that the ESL provided higher benefits than the WSL, as the route is more direct than the WSL leading to reduced journey times. The development in the WSL to allow for a free-flowing 70mph junction between the A122 and A2 reduced this differential.
	Be affordable to Government and users	The 2017 appraisal found that although the WSL had a lower cost, the ESL provided better value for money. A detailed costing and value for money assessment was not completed as part of the reappraisal for the ESL, as the design was not developed to a state appropriate for costing and economic appraisal.
	Value for money	
Environment	Minimise adverse impacts on health and the environment	All relevant environmental and health effects were appraised in 2017 and reported in the Post-Consultation Scheme Assessment Report (Highways England, 2017a). **Landscape/townscape** The reappraisal found that compared to the WSL, the ESL would result in comparable impacts to the AONB and Green Belt designations due to the scale of the A2/M2 junction and widening along the A2/M2. The ESL would have slightly lesser impacts to areas of Tree Preservation Order (TPO) woodland than with the WSL, though impacts to wooded sites north of the A2, which form part of the setting of the AONB, would be heavily impacted by the ESL. The ESL would result in similar levels of impact to National Character Areas as the WSL. Visibility of the M2/A2/A122 Lower Thames Crossing junction was likely to be very prominent within the AONB and its setting as a result of the ESL (similar to the visual impact of the A122 Lower Thames Crossing/A2 junction for the WSL).

Scheme Objective		ESL vs WSL
		Historic environment The reappraisal indicated that the updated ESL would still avoid impacts to Thong Conservation Area (which would be heavily impacted by the WSL) but, would result in impacts to both Shorne and Shorne Ridgeway Conservation Areas instead. The updated ESL would have a larger impact on built heritage assets than the WSL, resulting in the potential loss of several Grade II listed buildings. Impacts on Cobham Hall Registered Park and Garden remain similar to when assessed in 2017 in terms of visual impacts; however, the ESL's M2/A2/A122 Lower Thames Crossing junction would be a more prominent visual impact to the east of the registered park and gardens. **Biodiversity** The reappraisal identified that the ESL avoids impacts to Claylane Wood, which is impacted by the updated WSL, but impacts on Shorne and Ashenbank Woods SSSI and would result in the loss of approximately 50% of Great Crabbles Wood SSSI (ancient woodland) as well as areas of Local Wildlife Sites (some of which support ancient woodland), and an area of ancient woodland compensatory planting immediately south of Great Crabbles Wood – adjacent to the A289. **Air quality and noise** The ESL would bring the route closer to a number of properties to the east of Shorne and west of Strood and Higham. The WSL brings the route closer to the urban fringe of Gravesham, Thong and Chalk. Overall, the impact from the WSL could be considered to be more adverse due to the larger number of receptors. No significant adverse effects on air quality are identified on the WSL. **Impacts on property** The reappraisal found that the ESL would result in the likely need to demolish 10 residential properties and two commercial properties. The WSL would require the demolition of four residential properties and three commercial properties. The ESL would also impact on a number of water and gas mains, and on two reservoirs owned by Southern Water. The updated ESL has not considered how these utility conflicts would be addressed, but any resolution would be likely to increase the scale of works required and, therefore, the adverse effects of the ESL compared to the WSL. **Summary** Following the PRA, the WSL design has developed to include widening of the A2 through the Kent Downs AONB, a larger M2/A2/A122 Lower Thames Crossing junction, and the section of the route between the A2 and the South Portal has increased to dual three-lane. This has increased the intrusion into the AONB and on the setting. The widening of the A2 results in direct loss of ancient woodland, and direct loss of habitat from the woodland within Shorne and Ashenbank Woods SSSI. In comparing the current project WSL design with a similarly

Scheme Objective		ESL vs WSL
		updated ESL design, it can be concluded that the updated ESL would have overall greater impacts than the WSL. The ESL would result in large impacts on property owners, and worse biodiversity impacts overall. The updated ESL would have more impact on the historic environment, with a larger impact on built heritage assets than the WSL. Impacts on landscape and townscape would be similar for both the updated ESL and the WSL.

5.4.122 It remains the case in 2022 that the ESL does not provide an alternative solution located outside the Kent Downs AONB, as it would also result in the widening of roads within the Kent Downs AONB. The latest assessments show that while both the WSL and ESL would relieve congestion at Dartford to a comparable degree, the significantly greater environmental impacts of the ESL (and the limited scope to mitigate these) and also the greater construction impacts associated with the ESL, mean that it remains the case that the WSL is the option which best meets the Scheme Objectives.

Reappraisal of Route 4

5.4.123 To the north of the River Thames, Route 4, which was derived from options C4, C9, C14, was not taken forward due to its environmental impacts. The 2017 assessment identified that Route 4 impacted Thorndon Park, as well as six areas of ancient woodland and eight local wildlife sites north of the River Thames, while Route 3 north of the river impacted three local wildlife sites and no ancient woodland.

5.4.124 As the proposals have developed since PRA, the design of Route 3 has evolved and the information available on the area has increased. The proposed project set out in this application now results in significant adverse effects on three areas of ancient woodland north of the river, being Codham Hall Wood local wildlife site, Codham Hall Wood West site of importance for nature conservation and Rainbow Shaw local wildlife site, as well as significant impacts at Low Street Pit local wildlife site and Blackshots Nature Area local wildlife site (see ES Chapter 8: Terrestrial Biodiversity (Application Document 6.1)). The newly impacted Codham Hall sites are both impacted as a result of the inclusion of works to widen the M25 through junction 29 to accommodate additional traffic from the project. The ancient woodland at Rainbow Shaw was not recorded at the time of the assessment reported in 2017.

5.4.125 Two additional woodland sites are impacted by route 3. Folkes Lane ancient semi-natural woodland is within 2m of the Project Order Limits. There would be no direct loss of this habitat, but it will require protection in the form of protective fencing, dust suppression and surface water runoff treatment during construction, secured through the COCP and the Environmental Management Plan (Application Document 6.3). The second area is Thames Chase. It is directly impacted by the Project, however, replacement land and planting is proposed to offset this impact and this is secured through the replacement of Special Category Land and the Environmental Masterplan (ES Appendix 2.4 Application Document 6.2). Neither woodland is considered to have a significant impact as a result of the Project, as reported in ES Chapter 8: Terrestrial Biodiversity (Application Document 6.1).

5.4.126 The new traffic baseline and forecasts demonstrate that, as was the case with developing the proposed route, further development of Route 4 would also be needed to accommodate the increase in traffic. This would require an increase in carriageway width along much of the route, to a dual three-lane configuration. In addition, this would lead to additional works along the A127, and likely an increase in the scale of the junctions, with the A127 and with the M25 at junction 29. The ancient woodland sites identified on Route 4 are located alongside the A127 and in a cluster around the M25 junction 29 including both sites at Codham Hall significantly impacted by the current proposals.

5.4.127 While no design has been developed to accommodate the revised traffic forecasts, it is anticipated that the footprint of the highway and associated works would increase, leading to an increase in impacts on the ancient woodland sites located alongside the A127 and in the area around M25 junction 29. This would increase the relative difference in the environmental impacts between the Project alignment and Route 4, as it would increase the impact on several ancient woodlands. It is likely that this would also lead to an increase in the scale of the junction with the A127, which would increase the impacts on Thorndon Park and the communities at East Horndon and West Horndon.

5.4.128 Overall, while Route 4 would provide relief to the Dartford Crossing and approach roads, the increased adverse environmental impacts and cost make it a less optimal solution in comparison to the proposals set out in this application. Consequently, the decision not to take Route 4 forward remains valid.

Summary

5.4.129 As reported above a staged approach was taken to develop the preferred route, considering a range of corridors and assessing these for technical viability, potential to achieve the required outcome of relieving the congested Dartford Crossing and approach roads, and against environmental constraints. This approach led to the Secretary of State announcing the preferred route, constituting Route 3 at Location C and the Western Southern Link with a bored tunnel in 2017.

5.4.130 Following the announcement of the preferred route, new information became available through the development of a new traffic model and the introduction of new local plans, and the alignment changed as it was developed from the initial options stage, accounting for the further assessment and the outcomes of a series of consultations and extensive engagement. Prior to Statutory Consultation, and again in preparing this application, reappraisals were undertaken to verify that the decisions made in the route selection process remained valid, considering the revisions in design and the new information. These reappraisals confirmed that the choice of route remains valid, and that the proposed alignment, developed from Route 3 and the WSL, with a bored tunnel, remains the optimal solution.

5.5 Design refinement and evolution

5.5.1 The previous sections of Chapter 5 outline the process and rationale for the Project route alignment, including the route selection studies leading up to the PRA in 2017 and the subsequent reappraisal and backchecking which demonstrates that the chosen route (i.e. Route 3 + bored tunnel + WSL) represents the most appropriate option for delivering the Scheme Objectives and associated benefits while balancing potential environmental impacts.

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5.5.2 This section provides a summary of further design refinements and evolution to the Project based on the preferred route with cross references to the Project Design Report (Application Document 7.4) and the ES (Application Document 6.1) where necessary for further detail.

5.5.3 Following the announcement of the PRA, new information enabled the Project's design to be further developed (as well as informing the backchecking appraisal on the route itself as detailed in the previous section) as set out in Section 5.4. Sources of further information subsequent to the PRA included:

a. Stakeholder and community consultation and engagement.

b. Spatial allocations as identified in Section 5.4.

c. A new transport model as identified in Section 5.4. For additional detail see the Traffic Forecasts Non-Technical Summary (Application Document 7.8).

d. Environmental and geotechnical surveys carried out by the Applicant along the preferred route.

5.5.4 The following sections outline the key design changes first relating to the road alignment (in chronological order) that have been adopted by the Project before addressing other aspects of design evolution.

Refinement of the road alignment

Environmental Impact Assessment and Preferred Alignments

5.5.5 The Environmental Impact Assessment Scoping Report, produced in October 2017, had regard to various changes to specific sections of the route which are as follows:

a. New junction design to cross under the M25 to reduce the visual impact. Widening of a section of the M25 to improve traffic flow.

b. Ockendon – changed alignment to avoid going across the landfill.

c. A13 and A128 – redesigned the junction with the A13 to reduce congestion and allow removal of the A128 junction from the design.

d. A potential new junction near Tilbury – a possible alignment for a new junction near east Tilbury and a link road to the A1089 was presented.

e. Removal of A226 junction to reduce traffic impact on local roads.

f. New junction design and widening of A2 to M2, junction 1 to reduce congestion and improve traffic flow.

g. Change to three lanes, where appropriate, rather than two, for some of the route to future-proof the design.

5.5.6 The scoping report also indicated that work was ongoing to assess the length of the tunnel and the location of the tunnel portals to reduce the potential impact of the Project on designated sites.

Changes prior to the Statutory Consultation

5.5.7 Following further project development after the scoping stage, and prior to the Statutory Consultation, it was confirmed that the link between the Project and the A1089 at Tilbury would not be included in the Project.

5.5.8 Consequently in 2018 the Tilbury link road was removed from the design. While providing benefits for the local community, the Tilbury link road would not contribute to the Scheme Objectives of relieving the congested Dartford Crossing and approach roads and improve their performance by providing free-flowing north–south capacity. The Applicant recommended to DfT that the Tilbury link road should be developed as an independent project from the Lower Thames Crossing, and in 2020 the DfT provided funding to the Applicant to develop the Tilbury link road through RIS2 (DfT, 2020).

5.5.9 At Statutory Consultation in 2018, the proposals were revised to widen the road through junction 1 of the M2 to provide four lanes rather than three. There were also two additional lanes in both directions running parallel to the A2 to provide connections to the A289 and the old A2. Following the Statutory Consultation, the Project made alterations to minimise the footprint of the road through the AONB and Shorne Woods Country Park. On both M2 carriageways, the fourth lane were reverted to standard width, where practicable, through the AONB. The central reservation between Brewers Road green bridge and the Park Pale bridge was further reduced in width. The hard shoulder was also removed from the eastbound connector road along the A2 (with a hard strip in its place to ensure an appropriate standard of safety).

Supplementary Consultation changes

5.5.10 Supplementary Consultation, held January to April 2020, included a number of changes to the Project.

5.5.11 Key changes to the route included the identification of the need to provide additional capacity along the A2/M2 corridor, the removal of the Tilbury junction, changes to the access to the tunnel services building and changes in connectivity at the A13 junction.

5.5.12 Updated traffic modelling undertaken since PRA indicated an increased and changed pattern of flows, and a change to the design of the Project's main road from dual two- to dual three-lanes resulted in the identification of additional works to increase capacity on the A2/M2 corridor as congestion was forecast (alongside air quality and safety impacts). Alongside retaining the A2 in its current form, the following options were considered to address this issue:

a. Widening the A2 between M2 junction 1 and the Project's junction from dual four-lanes to dual five-lanes by adding an extra lane and keeping the hard shoulder.

b. Widening the A2 between M2 junction 1 and the Project's junction from dual four-lanes to dual five-lanes by conversion of the existing hard shoulder to a running lane.

c. Keeping the A2 as dual four-lanes and providing two-lane one-way connector roads in each direction parallel to the A2 between M2 junction 1 and the Project's junction. These connector roads connect to the A289 Wainscott Bypass and the old A2 into Strood and Rochester.

5.5.13 The option of maintaining the A2 in its current form was assessed in detail as it passed through the Kent Downs AONB. However, vehicles travelling along the M2 and the A2 towards the Project route would cross with traffic using the A2 to travel to and from the Medway towns. This resulted in high levels of weaving traffic, which would not comply with highway design standards or the Project's objective to improve safety. The option to retain dual four-lanes with a hard shoulder and provide connector roads was taken forward.

5.5.14 To the north of the Thames, access to the Tunnel Services Building was retained with provisions for places of relative safety incorporated along the route. Station Road, in East Tilbury, would be used for access for maintenance and operations, and specific emergency vehicle accesses have been provided at a number of locations along the route. A maintenance vehicle turnaround facility has been accommodated along the maintenance track serving the Tunnel Services Building.

Design Refinement Consultation

5.5.15 In July 2020 the Project carried out a Design Refinement Consultation. This was focused on refinements to the Project design in response to previous consultations. It did not propose any alterations to the alignment of the road. Instead, its focus was related to sharing further detail on mitigation areas, proposed upgrades to create green bridges and some further information relating to utility works. More details of the consultation can be found in the Consultation Report (Application Document 5.1) and the Project Design Report (Application Document 7.4) at Part G: Design Evolution.

Community Impacts and Local Refinement Consultations

5.5.16 At the Community Impacts Consultation in 2021, changes were made to the A13 junction comprising an extra lane on the link road extending from where the Project passes Baker Street through to the Orsett Cock junction to provide additional capacity. This resulted in an increased width to the carriageway.

5.5.17 Following the consideration of stakeholder feedback which had raised concerns about traffic using local roads to reach the Tilbury Docks area, the link road from the A13 to the A1089 was revised, so that traffic heading from the A13 westbound would need to leave the A13 at the Orsett Cock junction. The location of the new link would also mean that traffic on the Project road could access the Tilbury Docks area via the Orsett Cock junction. The new link road would reduce the amount of traffic using Brentwood Road and the A1013 when compared to the previous link road arrangement.

5.5.18 Elsewhere on the route, one lane was removed southbound between the M25 and A13 junctions. The Project's transport model forecasts that a significant

proportion of traffic travelling southbound on the Project would join from the A13 junction, so fewer vehicles would use the section of the route between the M25 and the A13 junction. As such, the design of this section was reduced to two lanes southbound between the M25 and the A13 junction.

5.5.19 This change resulted in a reduced area of land required for the Project on this section, lessening the environmental impact in the area and offering better value for money by only providing the capacity required.

5.5.20 This change also resulted in no longer needing to realign Ockendon Road or make changes to the bridge where the road passes over the M25.

Design evolution – other matters

5.5.21 In addition to the refinement of the road alignment, numerous other aspects of the Project, for both the construction and operational phases, have continually evolved leading up to the proposals contained in the DCO submission. These detailed elements of the Project have been communicated through, and influenced by, the extensive programme of engagement with stakeholders, and multiple rounds of public consultation (Statutory Consultation, Supplementary Consultation, Design Refinement Consultation, Community Impact Consultation, and the Local Refinement Consultation).

5.5.22 The proposals are the result of an iterative design process which has been informed by the existing and changing context of the route. This process, along with public and stakeholder consultation, Independent Design Panel Reviews and pre-application meetings with the local authorities, landowners, Natural England, Historic England and other key stakeholders, has informed the design.

5.5.23 As such, the overarching design development has been informed by:

a. Stakeholder input

b. The National Highways Design Review Panel (NHDRP)

c. Various assessments including Landscape Characterisation and the Green Infrastructure (GI) Study (Appendix H)

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d. Statutory, Supplementary, Design Refinement, Community Impacts and Local Refinement Consultation

e. Site visits and field work including ground investigations, ecological surveys and archaeological work

5.5.24 The Project has been developed to be landscape led, to support the recovery of nature, to be smarter by design and to ensure a high level of safety and resilience. Opportunities have also been identified to ensure the scheme improves connectivity between habitats and redresses historical severance by providing green corridors through the introduction of green bridges in carefully selected locations.

5.5.25 With regards to the construction design, the focus has been towards minimising the construction area and locating activities away from residential properties, commercial uses and environmental constraints as far as practicable.

5.5.26 The Project Design Report (Application Document 7.4) and the ES outlines key design changes as a result of consultation feedback the NHDRP and other sources listed above. These are not repeated in detail here, but include:

a. Ancient Woodland compensation – identification of suitable locations and management measures secured through the outline Landscape and Ecological Management Plan (Application Document 6.7).

b. Green bridges (Brewers Road/Thong Lane) – identification of opportunities to provide additional connectivity for people and wildlife.

c. WCH routes – opportunities to enhance connectivity within the WCH network through the provision of missing links in the network.

d. South Portal location and appearance – the location of the South Portal was moved south to reduce impact and the building design principles enables the structure to blend into the landscape.

e. Chalk Park – the design has evolved to allow access and create a public park.

f. Tilbury Viaduct – refinement of the design to reduce landscape impact of the structure.

g. Chadwell Link realignment and earthworks – design refined to reduce landscape impact though the alignment and use of false cuttings.

h. Tilbury Fields and the North Portal location and appearance – design has evolved to allow access and create a public park, while blending the portal into the landscape.

i. Mardyke and Orsett Fen Viaducts – developing the design of the infrastructure to sit within the landscape.

j. Woodland mitigation north of junction 29 – creation and location of accessible new woodland and provision of ancient woodland compensation.

k. Nitrogen deposition compensations sites – to offset the impacts of nitrogen deposition by creating new compensatory habitats.

5.5.27 Details of all changes made to the Project in response to pre application consultation and engagement are provided in the Consultation Report (Application Document 5.1).

5.6 Utilities diversions

5.6.1 The Project would require works to a number of existing utilities, including diversions to enable the Project to be constructed safely, protect existing supplies, facilitate future maintenance, and provide utilities connections to construction sites and the tunnel portal buildings. This section addresses the approach to considering alternative options for these necessary diversions as well as for the proposed location of ULHs required for specific utility works to be completed by the relevant utility company.

Utility diversion alternatives

5.6.2 The requirement for utilities diversions is primarily a consequence of the proposed route alignment for the road and its supporting infrastructure as addressed earlier in this chapter.

5.6.3 The development of the design for these diversions has recognised the potential for impacts from the proposals on features such as woodlands, open space and communities. The design development has sought to keep these impacts to a minimum through close working with the utility companies to agree how these works should be carried out and to identify the most appropriate diversion routes. Key considerations influencing the design have been:

a. Limiting diversions

b. Utility undertakers' alignment requirements

c. Reducing working areas

d. Minimising the environmental impact

e. Minimising the amount and duration of traffic management

5.6.4 To reduce disruption for road users and the local community, various construction methods have been considered, for example the use of trenchless technology such as directional drilling and tunnelling to install utilities beneath railways, watercourses and roads.

5.6.5 A number of utilities diversions are required for the Project (as described in ES Chapter 2: Project Description (Application Document 6.1)). ES Chapter 3: Assessment of Reasonable Alternatives (Application Document 6.1) provides a description of the approach adopted to determine the proposed alignment of the four diversions that would qualify as NSIPs in their own right (as listed in Table 5.18) as examples. These are summarised below.

Table 5.18 Essential energy diversions which qualify as NSIPs

NSIP	Scope
Work No. G2	Diversion of National Grid HP-Gas Pipeline (Feeder 5, Phase 1) in the vicinity of Claylane Wood
Work No. G3	Diversion of National Grid HP-Gas Pipeline (Feeder 18) in the vicinity of Claylane Wood
Work No. G4	Diversion of National Grid HP-Gas Pipeline (Feeder 5 – Phase 2) from Thong Lane to the A226
Work No. OH7	Diversion of National Grid Electricity Transmission network (ZB Route) around the A13

The gas pipeline diversions

5.6.6 The southern section of the Project where it connects with the A2 impacts on existing utilities and there is therefore a requirement to divert the existing Feeder 5 and Feeder 18 high pressure gas pipelines between Shorne and Farningham to accommodate the Project road. Without undertaking these diversions, current safety standards in relation to proximity to high density traffic

routes would no longer be satisfied. Further north where the road would be installed in a cutting, there is a conflict with the buried level of the existing feeders, therefore, also requiring a diversion. The alignment of the Feeder 5 diversion is also required to avoid the Project's drainage pond proposals, temporary construction compound area, the area to be landscaped as Chalk Park and to ensure the pipeline is accessible at all times of operation.

5.6.7 As explained in the ES, a number of different options were considered for the realignments informed by environmental survey and close dialogue with stakeholders and the utilities companies and National Grid to refine the proposals and minimise the land required for the gas diversion works. The options that could viably and technically deliver the diversions have, however, been largely constrained by the location of existing utilities and the Project route.

5.6.8 Some existing utilities are already located within sensitive locations, for example the gas pipeline along the northern edge of the Kent Downs AONB, which lies within close proximity to the A2 and other multi-utilities. The selected routes remain largely within the existing infrastructure corridor in order to minimise further encroachment into the AONB and other sensitive environmental designations and to moderate any harm by combining the development with the existing road and rail infrastructure. The only engineering alternative, to avoid diversion within the AONB, would be to reconfigure local utility networks from Gravesend to the M2 junction 1 via the A226 and local road networks. Even this would not avoid the need for some works within the AONB as customer connections would still need to be completed within the AONB. Therefore, such a reconfiguration would give rise to significant impacts on traffic/air quality, programme length and entail engineering complexities, while still requiring work within the AONB.

5.6.9 Notwithstanding this, significant improvements and design refinements have been made to reduce the land-take originally required for the utilities diversions as presented in the Supplementary Consultation (2020). These refinements included the avoidance of the utility diversions south of HS1 within Ashenbank Wood, reductions in the area required for diversions around Jeskyns Farm and reductions in the area required for the corridor south of Shorne Wood (required for the gas pipeline diversions north of the A2 which has been further reduced).

5.6.10 Therefore, while acknowledging that the utilities realignment would unavoidably impact on sensitive environmental designations, the options taken forward and the further design refinements demonstrate that the measures that have been adopted minimise their impact on these designations as far as practicable. The selected Project design therefore achieves an appropriate balance between the various engineering constraints, impacts on the environment and residential areas and also ensuring customer supply is maintained.

Overhead line diversion

5.6.11 Work No OH7 is required because the proposed new road layout and associated approach roads intersect with a number of existing power lines and pylon positions. In particular, the intersection between the Project route and the existing A13 comprises a complex layout of new approach roads and modifications to existing road crossings that effect a long section of overhead

line (OHL) routes. Alongside clearance issues, this will result in existing utilities becoming 'boxed in', i.e. surrounded by roads on all sides making access difficult for future maintenance. Work No OH7 is therefore essential to enable clearance of the required area for construction of the new roads and to provide adequate electrical clearance over the permanent crossings, including provision for future maintenance of the OHL.

5.6.12 The various factors which have been considered in assessing the various options for overhead line diversions relevant to the Project include:

a. Technical feasibility

b. Ensuring clearance of the Project road design

c. Minimising impacts on the existing OHL network

d. Minimising the length of change and the number of new and temporary towers

e. Ensuring efficient, safe and economical construction and maintenance

f. Factoring in construction work areas associated with access, scaffolding and stringing activities

g. Taking account of industry standard routeing practices through application of the Holford Rules and compliance with National Policy Statement EN-5

h. Avoiding/minimising impacts on known ecological, historic, landscape and visual, and socio-economic constraints

i. Having regard to project design elements including compounds, environmental mitigation, flood mitigation

5.6.13 Three overhead transmission line diversion options and two underground cable options were considered.

5.6.14 The three overhead line diversion options required the installation of new pylons and realignment of the overhead lines further south, closer to Chadwell St Mary.

5.6.15 The two underground cable routes were discounted by the Project in agreement with National Grid as it required the construction of a Cable Sealing End Compound at the transition point of overground to underground at each end for each network, four in total, resulting in a larger construction and easement area. The undergrounding would have required complex installation methods (trenchless methods of installation) in sensitive locations such as near to Scheduled Monuments, Blackshots Nature Area Local Wildlife Site and potentially contaminated land potentially resulting in greater environmental, ecological and archaeological impacts than the proposed design. The proposal would have added significant complexity to the network (due to ratings and system design) as well as increasing costs. This proposal would have committed the Project to modifying a larger section of the existing overhead line networks than is proposed.

5.6.16 Undergrounding would have presented construction, operation and maintenance considerations for National Grid which had communicated to the Project that it could not accept any adverse impact on the safety, security,

efficiency or reliability of the electricity and gas transmission networks or increase in the cost of the operation of these as a result of the Project.

5.6.17 Following engagement with National Grid, Thurrock Council and design review, the A122 route alignment in the Chadwell St Mary's link area was moved northwards to reduce the extent of the proposed overhead line diversion between Hornsby Lane and Hoford Road. This required the stopping up of Hornsby Lane and removal of a previously proposed bridge from the Project. The design then allowed the National Grid ZB routes to maintain their existing alignments south of the Project between Hornsby Lane and Hoford Road, reducing the length of the required overhead line diversion. This diversion route was included within the 2020 Supplementary Consultation.

Utility Logistics Hubs (ULHs)

5.6.18 ULHs shown on the Temporary Works Plans (Application Document 2.17) would be constructed for specific utility works to be completed by the relevant utility company. These would be established according to the timescales for which they would be operational; not all would be required immediately at the start of construction of the Project.

5.6.19 ULHs would typically be closely related to utility works that they are required to serve. Where possible they would be sited to take advantage of either the existing highway network or temporary construction access roads. Opportunities to minimise land-take by locating ULHs within main construction compounds have also been identified (e.g. Brentwood Road ULH and Stifford Clays Road ULH).

5.6.20 Having regard to the need to be located near to the relevant utilities works and opportunities to co-locate with construction compounds (addressed further below) the Project has then sought to avoid or minimise impacts on sensitive receptors and environmental designations.

5.6.21 Where ULHs would unavoidably impact directly upon identified constraints (such as the Orsett Cropmark Scheduled Monument as addressed in further detail in Chapter 6 of this Planning Statement in regard to the relevant policy tests), this feature is shown to already be subject to direct impacts from either the Project route or main construction working areas. These impacts would be managed by appropriate mitigation (including detailed investigation and recording), which will in turn enable a greater knowledge and understanding of cultural heritage interests within the study area (REAC references CH001, CH003, CH005, CH006, CH007 (Application Document 6.3, ES Appendix 2.2)) and will be legally secured through DCO Requirement 4.

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5.6.22 The Park Pale Lane ULH's location within the Kent Downs AONB is unavoidable as it is required to facilitate works within the AONB (which are in turn driven by the location of the existing utilities corridor within the AONB).

5.6.23 Whilst the majority of ULHs required to the north of the A13 junction lie within the wider Thames Chase Community Forest designation, these have been located to avoid areas of established woodland and removal of any vegetation would be minimised as far as practicable (REAC references LV001, LV002, LV003 and LV004 (Application Document 6.3, ES Appendix 2.2)). Where any trees or vegetation are to be removed this would be reinstated in accordance with the measures within the Environmental Masterplan (ES Appendix 2.4

Application Document 6.2) which would be legally secured through the draft DCO Requirement 4 (Application Document 3.1).

5.6.24 The UHL locations are associated with the location of the utilities works themselves, as they provide support to specific diversion works. The siting of these UHLs has been carefully considered and the majority of ULHs would avoid statutory designated biodiversity sites and none are required in close proximity to the protected sites of the Thames Estuary. The ULH locations would also avoid protected tree groups and other notable areas of woodland. The ULHs would typically involve less land-take than the main construction compounds.

5.6.25 The ULHs required to facilitate the Project, alongside the relevant factors which have influenced their location and layout are summarised in Table 5.19.

Table 5.19 Utility Logistics Hubs: locational considerations

Utility Logistics Hub	Approximate area (ha)	Locational considerations
Park Pale Lane ULH	0.94ha	• Necessity to be located at the eastern extent of gas diversion Work No G1a • Location within the Kent Downs AONB unavoidable as required to facilitate works proposed in this area dictated by the existing utility corridor • Avoids a group of four veteran trees (40m to the north) • Increased separation from Cobham Park to the south by the existing A2/M2 junction • Located to avoid Cobham ancient woodland and SSSI which lies 330m immediately to the west
A2 East ULH	1.56ha	• Located approximately midway along the route of Work No OH1/OHT1 (the relevant works to which this hub relates to) • Lies within land which will be directly impacted by the Project (will be regraded to form a false cutting) • Located entirely outside the AONB designation • Located to the east of the proposed Project route ensures it does not impact upon the ancient woodland of Claylane Woods or priority habitat deciduous woodland at Gravel Hill Wood • Also avoids SSSI to the east • Just under 180m from the Thong Conservation Area designation
A2 West ULH	5.27ha	• Located to serve Work Nos G2, G3 and G4 – as close as possible to these works while avoiding ancient woodland within Claylane Woods to the south • Sited to ensure a 30m buffer from residential properties to the west • Avoids heritage assets

Utility Logistics Hub	Approximate area (ha)	Locational considerations
Shorne Ifield Road ULH	6.08ha	• Necessity to be located towards the eastern extent of Work Nos G3 and G4 • Avoids Kent Downs AONB, ancient woodland and SSSI sites to the south – locating the compound to the north of the road ensures a degree of separation from these designations • Avoids direct impacts on heritage constraints
Low Street Lane ULH	0.84ha	• Necessity to be located within the main works area for Work Nos OH4 and OHT2 • Located to avoid the Low Street Conservation Area • No other significant environmental constraints
Muckingford Road ULH	0.96ha	• Necessity to be located within the main works area for Work Nos OH4 and OHT2 • Located to avoid notable landscape, heritage and ecological constraints
Brentwood Road ULH	1.32ha	• Required for Work No G5 and will be located directly west of these works • Lies wholly within the Brentwood Road main works compound to reduce the overall amount of land-take • Avoids a scheduled monument (causewayed enclosure and Anglo-Saxon cemetery) and the Mucking Heath Local Wildlife site to the east
Hornsby Lane ULH	1.43ha	• Required for Work Nos OH6, OH7, OHT4, OHT5, OHT6, OHT7 and will be located directly south of these overhead line works • Avoids a number of undesignated archaeological assets to the south and east
Long Lane ULH	1.8ha	• Required for Work Nos OH6, OH7, OHT4, OHT5, OHT6, OHT7 and will be located directly west of these works • Avoids the Blackshots Local Wildlife site to the north and has been located to relate closely to proposed Long Lane main works compounds • Also avoids the Orsett Cropmark Complex Scheduled Monument
Stifford Clays Road ULH	1.33ha	• Lies within the Orsett Cropmark Scheduled Monument but has been located partially within the Stifford Clays Road west compound to reduce land-take. This designation is already being impacted directly by the Project route and main works compounds and will be subject to significant investigation and recording as a result. • Avoids ecological and landscape constraints.

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Utility Logistics Hub	Approximate area (ha)	Locational considerations
		• Required for Work Nos OH6, OH7, OHT4, OHT5, OHT6, OHT7 and will be located directly west of these works.
Stanford Road ULH	1.48ha	• Required for Work Nos G6, G6a and G6b and will lie close to these works • No other significant environmental constraints
Green Lane ULH	1.32ha	• Located to avoid notable landscape, heritage and ecological constraints • Required for Work Nos G6 and G7 (located directly on the western extent of these works) • Avoids undesignated heritage assets which lie directly to the east and west and also the Orsett Cropmark Complex Scheduled Monument designation
Medebridge ULH	1.43ha	• Required for Works Nos OH7 and OHT8 – the ULH is located within the working area for these works at their northern extent • Located to avoid notable landscape, heritage and ecological constraints
Folkes Lane ULH	0.21ha	• Required for gas pipeline diversion (Work No G10) which straddles both sides of the Project route and will be located directly west of these works and the Project route
Beredens Lane ULH	1.32ha	• Required for gas pipeline diversion (Work No G10) which straddles both sides of the Project route and will be located directly north-east of these works (east of the Project route) • Avoids ancient woodland to the north

Deleted: Lies within the Orsett Cropmark Complex Scheduled Monument – however this area is already being directly impacted by the Project route, construction compounds and construction access roads – and these impacts are proposed to be mitigated by detailed investigation and recording

5.7 Construction compounds

5.7.1 Whilst the Project is being built 18 temporary construction compounds (in addition to the ULHs described above) would be located along the Project route, used to facilitate the works during part or all of the construction period (with operational periods dependent on the scope of works they are facilitating). These are shown on the Temporary Works Plans (Application Document 2.17).

5.7.2 Larger compounds would be required at the North and South Portals to allow for tunnelling operations and materials management. Compound locations are shown on ES Figure 2.5: Construction Information (Application Document 6.2) and indicative internal layouts are provided in ES Appendix 2.1: Construction Supporting Information (Application Document 6.3). Section 2.5 of ES Chapter 2: Project Description (Application Document 6.1), describes the approach for construction design, which has been developed as a collaborative and iterative process, taking into account the various constraints and opportunities associated with the Project, its location and surroundings. The ES refers to the

numerous construction buildability assessments which were carried out, which included input from environmental specialists (ES Chapter 2: Project Description – paragraphs 2.5.4 to 2.5.6 (Application Document 6.1)). The aim of the assessments was to improve the future construction scenario by identifying issues and eliminating or mitigating them early through the proposed construction approach and design development.

5.7.3 Part of this process has been to ensure works compounds, access tracks, haulage routes, material storage areas, generators and other construction activities would not be located within areas of retained vegetation as shown on ES Figure 2.4: Environmental Masterplan (Application Document 6.2) (REAC Ref. TB003). As a result, the construction compounds would also largely avoid arboricultural interests including both individual and group tree preservation orders. Alongside a review of stakeholder input, site visits have been undertaken to inform necessary refinements to construction compound locations and layouts to avoid environmental constraints where possible.

5.7.4 In areas which are not required for environmental mitigation, the approach has been to reduce permanent land acquisition by returning construction working areas to previous landowners where practicable. The design response to the various issues identified during this process in relation to construction compounds (among other design elements) is summarised in ES Chapter 2: Project Description (Application Document 6.1) but the key outputs are summarised as follows:

a. Site visits to determine suitable locations for accesses and construction routes

b. Amendments to construction compound layouts to avoid environmental constraints where practicable

c. Optimised plant layout within compounds to reduce noise, landscape and visual impact during the construction phase

5.7.5 Where compounds would unavoidably lie within close proximity to residential properties additional screening measures such as bunds and fencing will also be introduced. In order to reduce visual impacts, construction compound facilities greater than 6m in height would be located so as to maximise the distance from residential properties as far as practicable for the following compounds:

a. Marling Cross compound (REAC reference LV006)

b. A2 compound (REAC reference LV007)

c. Southern tunnel entrance compound (REAC reference LV010)

d. Gravesend Road compound (REAC reference LV012)

e. Station Road compound (REAC reference LV016)

f. Brentwood Road compound (REAC reference LV018)

g. Stifford Clays Road compound East (REAC reference LV019)

h. Mardyke compound (REAC reference LV020)

i. M25 compound (REAC reference LV022)

j. Ockendon Road compound (REAC reference LV025)

k. Warley Street compound (REAC reference LV027)

5.7.6 In the case of the northern tunnel entrance compound, the concrete batching plant and segment factory would be located adjacent to Readmans Industrial Estate in order reduce its visual prominence in the wider landscape.

5.7.7 Where the opportunity exists, construction compounds have been located outside flood zones. However, given that the Project route lies partially within Flood Zones 2 and 3, the following compounds also partially fall within this designation.

a. Northern tunnel entrance compound

b. Station Road compound

c. Mardyke compound

d. Southern tunnel entrance compound

e. Milton compound

5.7.8 These compounds would be laid out in accordance with a site-specific flood risk assessment following the Sequential Test, where facilities at highest vulnerability to flooding, e.g. sleeping accommodation, medical and welfare and principal office facilities, are located in the lowest flood risk zone (Zone 1). Only low vulnerability and water compatible uses would be situated in the high-risk Flood Zone 3. These measures are referred to within the REAC (reference RDWE022) contained within the Code of Construction Practice (Application Document 6.3, ES Appendix 2.2) and would be legally secured through DCO Requirement 4 (Application Document 3.1).

5.7.9 Other controls within the REAC secure commitments of the Project to avoid locating compounds in key environmental designations. No main construction compounds would, for example, be located within the Kent Downs AONB and this is a requirement reflected within REAC Reference LV005 (contained within the Code of Construction Practice (Application Document 6.3, ES Appendix 2.2)).

5.7.10 All 18 main compounds required to facilitate the Project (alongside the relevant locational considerations in each case) are summarised in Table 5.20 below

Table 5.20 Construction compounds – locational considerations

Main construction compound	Approximate area (ha)	Locational considerations
Marling Cross compound	0.3ha	• Already an established compound which benefits from utilities and good access. Located to avoid direct impacts upon landscape, cultural heritage assets and ecological interests.

Main construction compound	Approximate area (ha)	Locational considerations
		• Within National Highways ownership.
A2 compound	5ha	• Avoids Kent Downs AONB • Avoids ancient woodland/SSSI and the Thong Conservation Area (80m to the north) • 80m south of Thong Conservation Area
A226 Gravesend Road compound	5.6ha	• Avoids Thames Estuary and Marshes SSSI and Thames Estuary and Marshes SPA Ramsar, (located immediately to the north)
Milton compound	3.2ha	• Avoids Thames Estuary and Marshes SSSI and Thames Estuary and Marshes SPA Ramsar sites • Avoids (and is well distanced from) the SPA designation
Southern tunnel entrance compound	163ha	• Avoids (and is well distanced from) AONB, ancient woodland sites and also the Thames Estuary sites
Northern tunnel entrance compound	155ha	• Avoids the Thames Estuary and Marshes SSSI and Thames Estuary and Marshes SPA Ramsar (1km to the east) • Partially within Local Wildlife Site (although this site is primarily being impacted by the Project route itself).
Station Road compound	4.5 ha	• Avoids the Low Street Conservation Area (40m to the north-west)
Brentwood Road compound	11ha	• Grade II listed building just over 160m to the west. • The Brentwood Road ULH would be located within the footprint of the Brentwood Road compound to minimise land-take. • Avoids a scheduled Monument – Causewayed enclosure and Anglo-Saxon cemetery which lies immediately to the north and also the Mucking Heath Wildlife site immediately to the east.
Stanford Road compound	0.5ha	• Located to avoid direct impacts upon landscape, cultural heritage assets and ecological interests
Long Lane compound A	4.3ha	• Encroaches within the Blackshots Nature Area, although much of this site is already to be lost directly as a result of the Project.
Long Lane compound B	1.4ha	• Avoids further encroachment into the Blackshots Nature Area • No direct impact on cultural heritage
Stifford Clays Road compound West	4ha	• Configured to avoid three undesignated archaeological assets (including Bronze Age fragments) • Lies within the Orsett Cropmark Complex although the Project would impact upon a significantly

Main construction compound	Approximate area (ha)	Locational considerations
		greater extent of this asset (which will, as a result, be subject to detailed investigation and recording)
Stifford Clays Road compound East	6.7ha	• Located to avoid direct impacts upon landscape, cultural heritage assets and ecological interests
Mardyke compound	3ha	• Located to avoid direct impacts upon landscape, cultural heritage assets and ecological interests
Medebridge compound	4.3ha	• Located to avoid direct impacts upon landscape, cultural heritage assets and ecological interests
M25 compound	22ha	• Located and configured to avoid a number of constraints including the North Ockendon Conservation Area to the north, the St Mary Magdalene Churchyard Site of Importance for Nature Conservation (SINC), a number of notable tree groups and also North Ockendon Pit SINC (to the east) • A significant proportion of the compound would ultimately be occupied by the Project route itself, minimising the amount of land impacted over the construction phase
Ockendon Road compound	3.3ha	• Lies within the Thames Chase Community Forest (which is already being directly impacted by the Project route) • Located to avoid the Ockendon Railsides SINC to the west and Thames Chase SINC (to the north) • No direct impacts upon cultural heritage (well distanced from the Cranham Conservation Area to the north-west)
Warley Street compound	2.5ha	• Located to avoid direct impacts upon landscape, cultural heritage assets and ecological interests

5.7.11 The two portal compounds required for the tunnelling operations are by necessity more extensive than the other construction compounds due to the need for additional infrastructure to support the tunnelling operations and their location has primarily been determined by the location of the portals themselves (which have been influenced by the protected sites of the Thames Estuary among other factors). These compounds would also accommodate long-term stockpiling of ground materials in order to minimise impacts to the road network.

5.7.12 Alongside the various considerations referred to above, the objectives have also been to ensure the portal compounds would:

a. Be within land that is already in the Order Limits, e.g. due to utility diversion or surface water drainage basin construction

b. Be close to the source of the material and internal haul roads (to reduce the transportation of materials).

c. Avoid the construction footprint of the new road

5.7.13 Originally, the South Portal and southern tunnel entrance compound were to be located north of the A226. In response to stakeholder feedback from the Supplementary Consultation in 2020, and following further design development (including ground investigation) and a detailed assessment of the construction sequence for the South Portal, the tunnel was extended a further 350m south and the location of the portal moved south of the A226.

5.7.14 This avoids the need to pump water from the underlying Chalk aquifer during construction and potentially during operation. This revised design further reduces the potential for impacts to the Thames Estuary and Marshes Ramsar and SPA and South Thames Estuary and Marshes SSSI (which lie to the north). This was achieved by reducing the risks of saline intrusion, groundwater pollution and changes to the groundwater component of the water balance that supports the designated interests of the wetland site. It also moved the tunnel portal and associated construction activity further from Chalk Village. As a result, the southern tunnel entrance compound would be located to the south of the Ramsar site, with no direct connection to the River Thames. The move to a location south of the A226 was generally seen as positive by stakeholders.

5.7.15 The northern tunnel entrance compound is shown in ES Figure 2.5: Construction Information (Application Document 6.2) and would lie west of East Tilbury and Coalhouse Fort. It would benefit from direct access from the local road network. The selected location was previously used as part of the former Tilbury Power Station and former coal yard which already have hard standing surface. The proximity to the existing ports on the Thames will enable aggregate to be brought in via the river reducing the need for transportation on the public highway from the port to the construction compound. This location also offers potential benefits in relation to access arrangements and discussions are ongoing with the operator of the Port of Tilbury about using their new Tilbury2 infrastructure corridor as a primary access for the tunnelling compounds.

5.7.16 The northern tunnel entrance compound lies wholly outside the Thames Estuary SSSI, SPA and Ramsar sites (approximately 1km to the west) and also does not impact upon the Swanscombe Peninsular Marine Conservation Zone (MCZ). Whilst the compound does encroach within a local wildlife site, this designation is already being impacted by the route alignment and extensive mitigation is proposed in relation to this. Furthermore, the proposed compound layout has been designed to avoid any further encroachment southwards into the wildlife site.

5.8 Summary

5.8.1 The Dartford Crossing continues to present a barrier to economic growth, acting as a constraint on individuals and businesses. There remains strong evidence of the potential for the Project to generate significant wider economic impacts that could transform the economy of the Lower Thames area. The preferred scheme would drive economic benefit by unlocking constraints on economic growth and stimulating local and regional development, as well as supporting national growth.

5.8.2 This chapter has presented the approach and process to considering alternative options including alternative transport modes, route selection, design evolution

and consequential elements of the Project required to deliver the road including utilities diversions and construction compounds.

5.8.3 With regard to alternative modes, while the new crossing should ensure that there is adequate provision for WCHs and road based public transport, the DfT 2009 Study (and subsequent reappraisals of alternative modes) establishes that these alternative modes do not in themselves provide an alternative to the provision of a road crossing.

5.8.4 On route selection, the option identification and selection process described in this chapter that led to the development of the PRA has been subject to careful review. Each of the decisions was reviewed, both in 2018 and in preparation for the submission of this application, accounting for changes to local development plans, new understanding of traffic movements, and the design changes that had emerged through the development of the Project. It has been determined that the findings of the option identification and selection process remain valid. Route options at locations A, B, D and E would not meet the Scheme Objectives and are not viable. Of the route options at location C, Route 3 and the WSL, connected by a bored tunnel, remains the best solution.

5.8.5 The Project therefore satisfies the policy requirement under paragraph 4.27 of the NPSNN that all projects should be subject to an options appraisal (including consideration of viable modal alternatives). Whilst the Project has been included in a Road Investment Strategy (RIS2) this does not circumvent the other specific legal or policy requirements to consider alternatives.

5.8.6 The application duly complies with the legal and policy requirements in relation to alternatives as required by paragraph 4.26 of the NPSNN and NPS EN-1 paragraph 4.4.2. ES Chapter 3: Assessment of Reasonable Alternatives (Application Document 6.1) describes the main alternatives which have been assessed and the main alternatives considered taking into account the environmental effects in compliance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and the Habitats Regulations Assessment – Screening Report and Statement to Inform an Appropriate Assessment (Application Document 6.5) explains that there is no requirement to consider Stage 3 (which requires an assessment of alternatives) for the Project. A Water Framework Directive Assessment report (Application Document 6.3, ES Appendix 14.7) has been prepared for the Project. Where a particular NPS policy involves a specific requirement to consider alternatives (including the examples provided in the third bullet point of paragraph 4.26 of the NPSNN) these are addressed in Chapter 6 of this Planning Statement (and Appendices Appendix E and Appendix F in relation to Green Belt and AONB policy respectively).

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6 National Policy – Project-wide assessment

6.1 Introduction

The Planning Act 2008 and relevant NPSs

6.1.1 The Project has been appraised against the various policies contained in the National Policy Statement for National Networks (NPSNN) (DfT, 2014) in relation to the highway works of the Lower Thames Crossing. The gas pipelines and overhead line elements of the Project that are considered to be NSIPs, have been appraised in relation to the Overarching National Policy Statement for Energy (EN-1), National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4), the National Policy Statement for Electricity Networks Infrastructure (EN-5) (all DECC, 2011) and the Revised (draft) replacements of these three documents, issued by the Department for Business, Energy and Industrial Strategy (BEIS) in September 2021, as described in previous chapters.

6.1.2 An assessment of the Project against more recent policy statements has also been provided in submissions by the Applicant in respect of the March 2023 draft NPSNN (Policy accordance assessment of the Project against the Consultation draft NPSNN (published March 2023) [**REP4-209**]) and the November 2023 published revisions to the Energy NPSs (Applicant's response to ExA ISH12 AP23 on Suite of Energy National Policy Statements [**Document Reference 9.211**]). No further comment is made on these more recent statements in this Chapter.

6.1.3 The Project is located close to major ports including Tilbury, London Gateway, Purfleet, Medway and Sheerness, but does not itself comprise port infrastructure or have any direct impacts on these ports. This statement, therefore, demonstrates that the Project does not conflict with the strategic objectives of the National Policy Statement for Ports (NPSP) (DfT, 2012), notwithstanding it does not have effect in relation to the Project for the purposes of section 104 of the Planning Act 2008. The NPSP is considered further in Chapter 6 of this Planning Statement.

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6.1.4 This chapter of the Planning Statement is structured so as to broadly follow that of the NPSNN, as follows:

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a. Section 6.2 – The Need for the Project in NPSNN terms – this section does not repeat the discussion of need presented in Chapter 4 of this Planning Statement (or the Need for the Project (Application Document 7.1)) but demonstrates how the Project is consistent with, and makes a substantial contribution to, the Government's vision and objectives for national networks.

b. Section 6.3 – Wider Government policy on the national networks – this section addresses matters raised in Section 3 of the NPSNN including such issues as environment and social impacts, emissions, safety, technology, sustainable transport, accessibility and road tolling and charging.

c. Section 6.4 – NPS assessment principles – this section addresses matters raised in Section 4 of the NPSNN including such issues as Environmental Impact Assessment, Habitats Regulations Assessment, the consideration of

alternatives, design, climate change adaptation, pollution control and other environmental protection regimes, common law and statutory nuisance, safety, security and health.

d. Section 6.5 – Generic NPS impacts – this section demonstrates accordance with the 'generic impact' requirements of Section 5 of both the NPSNN and NPS EN-1 and equivalent and relevant sections in Part 2 of NPS EN-4 and NPS EN-5, as many of these generic impacts are covered consistently across the various NPSs.

e. Section 6.6 – Energy policy and additional Energy NPS (including draft Energy NPS) requirements – the Energy NPSs and the draft revisions to the Energy NPSs raise a number of matters which are not included in the NPSNN and which are, or may be, relevant to the Energy NSIP elements of the Project. These impacts are addressed in this section.

f. Section 6.7– Summary and Conclusion

6.1.5 It should be noted that the NPSNN Accordance Table (Appendix A to this Planning Statement) provides a more comprehensive response to each individual paragraph of the NPSNN, relevant to the consideration of the DCO Application, than is contained in this chapter. It also signposts to the relevant application document(s) that address(es) the particular issue in full.

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6.1.6 Appendix B to this Planning Statement presents the equivalent in respect of the three Energy NPSs EN-1, EN-4 and EN-5 and, in so far as they are relevant to the consideration of this Project, the September 2021 draft revisions to the three Energy NPSs.

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6.2 The need for the Project in the context set by Government's policy and objectives for the national networks

6.2.1 The need for the Project, in terms of delivering a wide range of national and regional economic, social and environmental objectives, is presented in Application Document 7.1: Need for the Project and is summarised in Chapter 4 of this Planning Statement. These sections of the Planning Statement identify that there is a clear and overriding need for the Project in order to achieve these wide-ranging objectives.

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6.2.2 Section 2 of the NPSNN sets out the Government's vision and strategic objectives for the national networks and its policy to ensure these objectives are met. The purpose of this section of the Planning Statement is to identify how the Scheme Objectives and design of the Project sit within, and to demonstrate that the Project is entirely consistent with, and would make a substantial contribution to, the Government's vision and strategic objectives for the national networks set out in Section 2 of the NPSNN.

6.2.3 The assessment is set out in Table 6.1.

Table 6.1 Accordance of need for the Project and NPSNN objectives

Government vision and strategic objectives for national networks	Scheme Objectives	Project accordance
The Government will deliver national networks that meet the country's long-term needs; supporting a prosperous and competitive economy and improving overall quality of life, as part of a wider transport system. Achieving this means:	To support sustainable local development and regional economic growth in the medium to long term. To be affordable to government and users. To achieve value for money.	The Project would support sustainable local development and regional economic growth in the long term by providing improved journey times and relieving congestion on the Dartford Crossing and approach roads. Through these improvements, the Project would also benefit leisure and business travellers by providing quicker, more reliable journey times locally, regionally and nationally. This would help meet the demands of future traffic growth east of London (see Appendix C and Appendix D of the ComMA, Application Document 7.7). These improvements would make the local area and the South East more attractive for businesses to locate and contribute to the promotion of a competitive local economy. The Project would provide WCH upgrades and new recreational areas improving quality of life. This is set out in detail below.
1. Networks with the capacity and connectivity and resilience to support national and local economic activity and facilitate growth and create jobs;	To support sustainable local development and regional economic growth in the medium to long term	Chapter 5 of the Need for the Project (Application Document 7.1) explains how the Project would reduce congestion at the Dartford Crossing and create additional capacity across the River Thames east of London. Additionally, it explains how the Project would support economic growth, locally, regionally and nationally. The Project would also boost business productivity and open up opportunities for local economic growth. The enhanced connectivity would enable businesses to benefit from knowledge and technology synergies and a deeper understanding of business and labour markets, which would help strengthen local skills. The Project would also provide scope for delivering more transformational benefits for the local economy by unlocking cross-river trading opportunities that would strengthen competition and enhance business productivity. With more certainty over journey times and commuting costs in the Lower Thames area, firms and workers would both be more willing to look further afield for business and employment opportunities across the river. For example, reductions in commuting journey time and cost would increase labour supply and the propensity for employers to hire people who live on the 'other side of the Thames'. These changes

Government vision and strategic objectives for national networks	Scheme Objectives	Project accordance
		are likely to encourage the development of a large and more competitive single market in the Lower Thames area, spanning both sides of the River. While the Dartford Crossing infrastructure remains available for many years of future service, National Highways has had to implement longer-term closures of critical infrastructure on the strategic road network (SRN) for maintenance. By providing a crossing of the River Thames, the Project would improve the resilience of the road network in the event of a longer-term closure of part of the existing Dartford Crossing or approach roads. In addition, the provision of an alternative crossing of the River Thames would provide increased flexibility for undertaking maintenance works while continuing to maintain connectivity across the SRN. This would result in shorter and less-complex diversion routes for certain closures, particularly for larger vehicles.
2. Networks which support and improve journey quality, reliability and safety;	To relieve the congested Dartford Crossing and approach roads and improve their performance by providing free-flowing north-south capacity. To improve safety.	The Scheme Objectives include relieving the congested Dartford Crossing and the approach roads, improving their performance by providing free-flowing north-south capacity, improving the resilience of the Thames crossing and the major road network, and improving safety. The Transport Assessment (TA) (Application Document 7.9) shows the Project would significantly improve journey times and reduce congestion on the Dartford Crossing and approach roads while also providing over 80% additional road capacity across the River Thames east of London. In terms of safety, the TA (Table 9.5 in Part 2) also shows that, as a result of the Project, there would be a reduction in the accident rate (accidents per vehicle kilometre travelled) in the area.
3. Networks which support the delivery of environmental goals and the move to a low carbon economy;	To minimise adverse impacts on health and the environment	The Environmental Statement (ES) (Application Documents 6.1, 6.2 and 6.3) provides an assessment of the likely significant effects of the Project on the environment, the measures which are proposed to reduce or offset those effects and all other information required to be included in an ES by Regulation 14(2) of the EIA Regulations. The ES topic chapters and accompanying appendices describe the legislative framework applicable to the assessments and how the Project would affect the delivery of environment goals where relevant.

Government vision and strategic objectives for national networks	Scheme Objectives	Project accordance
		Opportunities taken to reduce carbon emissions are discussed in the Carbon and Energy Management Plan (Application Document 7.19) and ES Chapter 15: Climate (Application Document 6.1). It is also addressed in Appendix I: Carbon Strategy and Policy Alignment of this Planning Statement which sets out the low carbon innovation and approaches which would be used in the Project to explore how the Applicant can reach its target of achieving carbon neutral construction by 2040 and help the UK reach net zero by 2050. Appendix I explains how the Project represents a step change in approach for a road scheme of this scale, in terms of the scope and nature of the measures which the Applicant is committing to deliver to reduce emissions during the construction and operation of the new road. The impact of the Project on human receptors from air quality is not considered to be significant, and it is not predicted to affect the UK's reported ability to comply with the Air Quality Directive. The Project would have a significant air quality effect on ecological receptors at a number of designated habitats as a result of an increase in nitrogen deposition. Compensation for these effects is provided in the form of the creation of new areas of planting and habitat creation. The air quality assessment for the Project is contained within ES Chapter 5: Air Quality (Application Document 6.1). The assessment of nitrogen deposition impacts on designated habitats is contained within ES Chapter 8: Terrestrial Biodiversity (Application Document 6.1). The Project would not prevent the move to a low carbon economy. The government's Transport Decarbonisation plan sets out the approach to be adopted to deliver 'net zero'. This requires electrification of private vehicles and the development of an alternative fuel approach to HGVs (hydrogen / battery / overhead gantries). Any new technologies brought forward to achieve these goals will need to be compatible with the existing road network, and therefore the Project design, by conforming to the latest standards.

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Government vision and strategic objectives for national networks	Scheme Objectives	Project accordance
4. Networks which join up our communities and link effectively to each other.	To improve the resilience of the Thames crossings and the major road network	The Need for the Project (Application Document 7.1) explains that the Project would help relieve congestion on both sides of the River Thames east of London, and that this additional connectivity would improve the ability for local traffic to cross the River Thames. ES Chapter 13: Population and Human Health (Application Document 6.1) demonstrates that the Project would improve connectivity and accessibility for WCH through the creation of new WCH routes. The Project has sought to ensure that all WCH routes that would be severed by the route (and historic severances where reasonably practicable) have been reconnected. These routes and crossings across the Project have been designed to allow for inclusive use by ensuring they allow sufficient space and a quality user experience for all.

6.3 Wider Government policy on the national networks

Introduction

6.3.1 Paragraph 3.1 of the NPSNN notes that policy for national networks should be seen the context with wider policies and the NPSNN. Chapter 3 of the NPSNN sets these out for context for the rest of the NPSNN. It addresses such matters as the following:

a. Environmental and social impacts

b. Emissions

c. Safety

d. Technology

e. Sustainable Transport

f. Accessibility

g. Road tolling and charging

6.3.2 Chapter 3 of the NPSNN reflects other Government wider policy and other policies and strategies that are relevant to the application (as also addressed in Chapter 7 of this Planning Statement).

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6.3.3 The purpose of this section of the Planning Statement is to set out how the Project is consistent with the principles of those wider policies. However, the decision making polices against which to assess the application are contained in the Assessment Principles and Generic Impacts sections of the NPS.

6.3.4 These matters are addressed in turn below.

Environmental and social impacts

6.3.5 In paragraph 3.2 of the NPSNN, Government recognises that national networks infrastructure should be designed to minimise social and environmental impacts and improve quality of life if it is to be considered sustainable. Paragraph 3.3 requires applicants to avoid and mitigate environmental and social impacts and to show they have considered reasonable opportunities to deliver environmental and social benefits as part of their schemes.

6.3.6 In designing and developing the Project the Applicant has taken care to avoid, minimise and mitigate any negative social and environmental impacts wherever possible and to deliver benefits which would improve quality of life (Application Document 7.1: Need for the Project). A wide range of mitigation measures and enhancements, including some landscape-scale interventions, are incorporated into the design of the scheme in the form of embedded mitigation measures covering a wide range of environmental and social impacts. These are incorporated through the preliminary scheme design and, in some instances, the Design Principles (Application Document 7.5). Where it has not been possible to avoid impacts in the scheme design additional mitigation measures are proposed as 'essential mitigation'. Delivery of this mitigation is guaranteed through the REAC which is secured through Requirements contained in Schedule 2 to the draft DCO (Application Document 3.1). Further control

measures are also contained in the various management plans which are also secured via Schedule 2 to the draft DCO.

6.3.7 In considering social and environmental benefits and quality of life matters consideration has to be given not only to the impacts caused by the construction of the Project but also the impacts and benefits which would be achieved by the operation of the Project and by removing or minimising existing adverse impacts elsewhere i.e. the alleviation of congestion at the Dartford Crossing which is a key Scheme Objective.

Emissions

6.3.8 Paragraphs 3.6 and 3.7 of the NPSNN identify the benefits which will be achieved through the decarbonisation of the transport sector and the development of energy efficient and environmentally friendly ultra-low emission vehicles (ULEVs) and pure electric vehicles. Paragraph 3.8 notes that the impact of road development on aggregate emission levels is likely to be 'very small' when considered against the wider benefits (in terms of air quality improvements and reductions in carbon emissions) from the decarbonisation of the transport sector described in paragraphs 3.6 and 3.7. This is consistent with the findings of ES Chapter 15: Climate (Application Document 6.1) which concludes that the effect of the Project on Green House Gas emissions on the ability of the Government to meet its carbon reduction targets both during the construction and operational phases of the Project are not anticipated to be significant. The Project would set new standards of best practice in carbon reduction and carbon management, setting an example for other large scale construction projects to replicate, learn from and seek to enhance. This approach is set out in Appendix I (Carbon Strategy and Policy Alignment) of this Planning Statement.

Deleted: Appendix I

6.3.9 ES Chapter 5: Air Quality (Application Document 6.1) identifies that, while there are areas within the Order Limits where air quality is anticipated to worsen, there are more areas where air quality would be improved. There would be significant improvements in air quality achieved during operation as the Project alleviates congestion at the Dartford Crossing. Overall, the Project would not affect the UK's ability to achieve compliance with the Air Quality Directive.

Safety

6.3.10 Paragraph 3.10 of the NPSNN requires scheme promoters to take opportunities to improve road safety including use of the most modern and effective safety measures, where appropriate. The Applicant has sought to do this through the design of the Project to appropriate standards set in relevant legislation and guidance. Safety is addressed more fully in Section 6.4 in the context of paragraph 4.66 of the NPSNN which also deals with safety.

Technology

6.3.11 Paragraphs 3.13 and 3.14 of the NPSNN identify that new and emerging technologies have the potential to make significant differences to travel choices and behaviours but that they are uncertain and, in any event, are unlikely to have a significant impact on the need for the development of national networks infrastructure. The design of the Project accommodates existing established technologies in particular electric vehicles, vehicle monitoring technology and

does not prohibit the adoption of future technologies, these are not within the scope of the Project currently.

Sustainable transport

6.3.12 Paragraphs 3.15 to 3.17 of the NPSNN identify the benefits that can be achieved by providing the opportunity for people to choose sustainable travel options and the role for new national networks infrastructure in helping to develop a high-quality walking and cycling network to encourage a step change in walking and cycling. Accordingly, Government expects Applicants to:

> '… identify opportunities to invest in infrastructure in locations where the national road network severs communities and acts as a barrier to cycling and walking, by correcting historic problems, retrofitting the latest solutions and ensuring that it is easy and safe for cyclists to use junctions.' (NPSNN paragraph 3.17)

6.3.13 The Project has considered the needs of pedestrians and cyclists in the design and has identified opportunities to improve or enhance facilities for walkers, cyclists and horse riders (WCH). ES Chapter 13: Population and Human Health (Application Document 6.1) outlines the provision of opportunities for WCH, which are designed to improve access to the existing network for all users (including those with limited mobility). The Project would include comprehensive new or improved provision of PRoW and cycleways as follows:

a. Existing – diverted
    i. 3.45km of footpath diverted
    ii. 2.14km bridleway diverted
b. Existing – improved
    i. 0.48km of improved byway
    ii. 3.02m of improved bridleway
    iii. 1.5km of improved footpaths
    iv. 4.08km of improved pedestrian-cycle path
c. Existing – designation upgrades
    i. 10.69km of footpaths upgraded to bridleway
    ii. 0.87km of footpaths upgraded to pedestrian-cycle path
d. New
    i. 3.2km of new footpath
    ii. 15.95km of new bridleway
    iii. 7.2km of new pedestrian-cycle path

iv. 5.6km of new pedestrian-cycle-equestrian path

v. 4.5km of new permissive footpath

vi. 1.4km of new permissive bridleway

vii. 0.95km of new permissive pedestrian-cycle path

6.3.14 In response to the severance issues raised by the Project, the needs of WCH are being met in a number of ways, including the creation of a number of green bridges and all severed Public Rights of Way (PRoWs), bridleways and cycle routes are to be re-linked across the Project unless better quality routes can be provided in the vicinity, the route can be rationalised to better link communities, or realigned to provide better connectivity into the existing WCH network.

Deleted: These measures are secured through a Section 106 Agreement. The Heads of Terms are set out in Section 7.5 of Application Document 7.3.

Accessibility

6.3.15 Paragraphs 3.19 to 3.22 set out the Government's aspirations and expectations in terms of creating a more accessible and inclusive transport network that provides a range of options for people to travel, meets the needs of disabled people and reduces community severance.

6.3.16 The second bullet to paragraph 3.20 states:

> '*The Government expects applicants to improve access, wherever possible, on and around the national networks by designing and delivering schemes that take account of the accessibility requirements of all those who use, or are affected by, national networks infrastructure, including disabled users. All reasonable opportunities to deliver improvements in accessibility on and to the existing national road network should also be taken wherever appropriate.*'

6.3.17 As set out in the Need for the Project (Application Document 7.1), congestion at the Dartford Crossing impacts surrounding areas on both sides of the River Thames, the introduction of the Project would relieve existing congestion at Dartford and provide improved north-south connections, enabling better accessibility to employment and services.

6.3.18 The Project would also allow additional and more reliable journeys across the River Thames improving journey times, providing increased reliability, enhancing the driver experience and reducing driver stress.

6.3.19 Section 4 of The Need for the Project (Application Document 7.1) identifies the various benefits which would be delivered by the Project, particularly in relation to walking and accessibility, provision for walkers, cyclists and horse riders, provision of jobs and skills and green infrastructure. Chapter 5 of the Project Design Report (Application Document 7.4) sets out that the Project design approach seeks to maximise opportunities to deliver benefits for employment, through faster travel times and improved safety and resilience.

6.3.20 Chapter 3 of the Design Principles (Application Document 7.5) sets out the Project's design principles for connecting people and places and how this would be achieved.

6.3.21 ES Chapter 13: Population and Human Health (Application Document 6.1) provides an assessment of the Project on population and human health during construction and operation and has been informed by a Health and Equalities Impact Assessment (Application Document 7.10). The assessment has been undertaken to ensure that the Project does not discriminate or disadvantage people and considers how equality can be advanced. National Highways design standards and Project specific details are compliant with national legislation under the Equality Act 2010 and associated Public Sector Equality Duty.

6.3.22 Severance is addressed under the previous heading 'Sustainable Transport' in response to paragraph 3.17 of the NPSNN.

Road tolling and charging

6.3.23 Paragraphs 3.24 and 3.25 of the NPSNN explain that Government considers tolling may be an appropriate means of funding new road capacity on the SRN and that, where river and/or estuary crossings are concerned, these will normally be funded by tolls or road user charges.

6.3.24 In accordance with this policy context the Applicant proposes that vehicles would be charged for using the new Lower Thames Crossing tunnel. Charges would reflect those currently charged at the Dartford Crossing. The Road User Charging Statement (Application Document 7.6) has been reviewed and approved by the Department for Transport (DfT) which has confirmed that the proposals are in line with Government policy and the Scheme Objectives.

6.4 NPS assessment principles

Introduction

6.4.1 Chapter 4 of the NPSNN identifies a number of general principles of assessment against which applications relating to national networks infrastructure are to be decided. NPS EN-1 contains a number of the same Assessment Principles headings as NPSNN. Therefore, where NPS EN-1 is applicable (i.e. to the energy NSIP elements of the Project) the relevant policy tests are dealt with addressed together. Any policy tests specific to NPS EN-1 which do not form part of the NPSNN are then addressed separately in Section 6.6 of this chapter.

6.4.2 After setting some general principles of assessment, chapter 4 of the NPSNN sets out Government's policy in terms of the following:

a. Environmental Impact Assessment

b. Habitats Regulations Assessment

c. Alternatives

d. Design

e. Climate change

f. Pollution and other environmental protection regimes

g. Common law and statutory nuisance

h. Safety

i. Security

6.4.3 This section of the Planning Statement addresses the general principles, and then takes the specific policies ((a) to (i) above) in turn.

General principles of assessment

6.4.4 These general principles of assessment include the following:

a. The presumption in favour of granting development consent for national networks NSIPs that fall within the need for infrastructure identified in the NPSNN (paragraph 4.2 in the NPSNN and the equivalent at paragraph 4.1.2 of the NPS EN-1).

b. The need for the Examining Authority and the Secretary of State (SoS) to weigh any adverse impacts of any scheme against its potential benefits and to consider impacts and benefits at the national, regional and local levels (paragraphs 4.3 and 4.4 of the NPSNN and 4.1.3 and 4.1.4 of the NPS EN-1).

6.4.5 NPSNN paragraph 4.5 requires that:

> ‘Applications for road and rail projects … (will normally be supported by a business case prepared in accordance with Treasury Green Book principles.’

6.4.6 The approach taken by National Highways has followed DfT's Transport Analysis Guidance (TAG), which applies the Treasury Green Book principles to the appraisal of Transport Schemes. The outputs are presented in Appendix D, Economic Appraisal Report to the ComMA (Application Document 7.7).

6.4.7 NPSNN paragraph 4.6 advises that:

> ‘Applications for road and rail projects should usually be supported by a local transport model to provide sufficiently accurate detail of the impacts of a project. The modelling will usually include national level factors around the key drivers of transport demand such as economic growth, demographic change, travel costs and labour market participation, as well as local factors. The Examining Authority and the Secretary of State do not need to be concerned with the national methodology and national assumptions around the key drivers of transport demand. We do encourage an assessment of the benefits and costs of schemes under high and low growth scenarios, in addition to the core case. The modelling should be proportionate to the scale of the scheme and include appropriate sensitivity analysis to consider the impact of uncertainty on project impacts.’

6.4.8 Due to the scale of the Project, a strategic transport model has been produced in line with DfT guidelines. The Lower Thames Area Model (LTAM) has been developed as a simulation of the transport system in the Lower Thames area. The model contains a detailed representation of the road network in the Lower Thames area and information on where people travelled to and from in an average month (March 2016). It uses an industry-recognised method of predicting future traffic flows and conditions, both with and without the Project,

and shows the number of people choosing to travel by road and rail, the route they use now and the route they are forecast to use. This enables predictions to be made on how many vehicles would use each part of the road network in the future and how long it would take to complete a journey.

6.4.9 In addition to appraising the core scenario (a scenario based on the most unbiased and realistic set of assumptions that will form the central case, i.e., the 'with Project' scenario), the LTAM has also been used to assess the impacts of high and low growth scenarios, in accordance with guidance in TAG unit M4 Forecasting and Uncertainty (DfT 2019) and the sensitivity analysis required by NPSNN paragraph 4.6.

Environmental Impact Assessment

6.4.10 NPSNN paragraph 4.15 states that:

> 'All proposals for projects that are subject to the European Union's Environmental Impact Assessment Directive and are likely to have significant effects on the environment, must be accompanied by an environmental statement (ES), describing the aspects of the environment likely to be significantly affected by the project. The Directive specifically requires an environmental impact assessment to identify, describe and assess effects on human beings [54], fauna and flora, soil, water, air, climate, the landscape material assets and cultural heritage and the interaction between them.'

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6.4.11 Footnote 54 clarifies that the effects on human beings includes effects on health.

6.4.12 The same requirements apply in NPS EN-1 and the draft review of NPS EN-1 (paragraph 4.2.1 in each case).

6.4.13 The Application for Development Consent is accompanied by a fully compliant Environmental Impact Assessment, prepared in accordance with the Scoping Opinion issued by the Planning Inspectorate (refer to ES Chapter 4: EIA Methodology, for more information). The ES comprises three volumes:

a. Volume 1 – ES main text (Application Document 6.1)

b. Volume 2 – ES figures (Application Document 6.2)

c. Volume 3 – ES appendices (Application Document 6.3)

6.4.14 A separate ES Non-Technical Summary (NTS) (Application Document 6.4) has been included as part of the Application Documents.

6.4.15 Paragraphs 4.16 and 4.17 of the NPSNN (4.3.5 and 4.2.6 of the NPS EN-1) deal with the issue of cumulative effects and how these should be considered by the Examining Authority.

6.4.16 ES Chapter 16: Cumulative Effects Assessment (Application Document 6.1) sets out the how the effects of the Project would combine within the Project and interact with the effects of other developments within the zone of influence.

6.4.17 The assessment provides a summary of reasonably foreseeable developments identified as having the potential for cumulative effects with the Project, broken

down into developments having an impact during the construction phase and those during the operational phase of the Project.

6.4.18 Paragraphs 4.18-4.20 of the NPSNN (4.2.8 to 4.2.10 of the NPS EN-1) deal with matters which are not finalised at the time of submission of a DCO Application. In this context, it should be noted that details of the Project design are shown on the Works Plans (Application Document 2.6) and Engineering Section Drawings (Application Document 2.9). That design is subject to limits of deviation (LoD) which represent an 'envelope' within which the tunnel and highway works would be constructed. The LoD define the maximum extent to which the main elements of the Project can deviate spatially, both horizontally (in plan) and vertically (in elevation).

6.4.19 The precise design would be further finessed prior to construction, however, that design development would take place within the constraints defined by the DCO, the LoD and by the Rochdale Envelope. Chapter 12 of the Introduction to the Application (Application Document 1.3) sets out further justification for the approach to defining the LoD.

6.4.20 Schedule 2 to the draft DCO (Application Document 3.1) also sets out a number of plans, schemes and details which will need to be approved following any made DCO. That information is also dependent on the detailed design and construction methodology for the Project. Nonetheless, the Applicant has submitted with this application a number of outline management plans which provide a proportionate and appropriate level of information on the measures which are proposed to be adopted and which establish a framework to ensure appropriate management at that later stage.

Habitats Regulations Assessment

6.4.21 Paragraph 4.22 of the NPSNN (4.3.1 of the NPS EN-1) requires the Secretary of State (SoS), prior to granting a DCO, to consider whether a project could have a significant effect on the objectives of a European site, either alone or in combination with other plans or projects. Paragraph 4.23 of the NPSNN requires Applicants to provide sufficient information to enable the SoS to carry out an Appropriate Assessment, if required.

6.4.22 A Habitats Regulations Assessment (HRA) Report: Screening Report and Statement to Inform an Appropriate Assessment (Application Document 6.5) has been prepared setting out the assessment of likely significant effects on European sites as a result of the Project, either alone or in combination with other plans or projects. It contains sufficient and appropriate information to comply with the requirements of the Conservation of Habitats and Species Regulations 2017 (as amended).

6.4.23 The conclusion of the Stage 1 Screening Report is that, following discussions with Natural England, there remained uncertainty as to whether a small number of sites would be subject to significant effects.

6.4.24 Accordingly, a Stage 2 Appropriate Assessment has been carried out to assess the effects of the Project on the conservation objectives of these sites and whether or not it would delay or interrupt progress towards achieving those objectives.

6.4.25 The Stage 2 Assessment has concluded, beyond reasonable scientific doubt that the Project would not adversely affect the integrity of any European site during its construction or operational phases, either alone or in combination with other plans or projects.

6.4.26 As a consequence, paragraphs 4.24 and 4.25 of the NPSNN, which deal with a situation where an adverse effect cannot be ruled out and derogations are required, do not apply.

Alternatives

6.4.27 The assessment in Chapter 4 of this Planning Statement addresses the relevant policy tests relating to alternatives at paragraph 4.26 and 4.27 of the NPSNN and 4.4.1 and 4.4.2 of NPS EN-1.

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Design

6.4.28 NPSNN paragraph 4.28 requires Applicants to include design as an integral consideration of a proposal from the outset. NPSNN paragraph 4.29 states that:

> 'Visual appearance should be a key factor in considering the design of new infrastructure, as well as functionality, fitness for purpose, sustainability and cost.'

6.4.29 However, NPSNN paragraph 4.30 acknowledges that:

> 'Given the nature of much national network infrastructure development…there may be a limit on the extent to which it can contribute to the enhancement of the quality of the area.'

6.4.30 NPSNN paragraph 4.32 notes that:

> 'Scheme design will be a material consideration in decision making. The Secretary of State needs to be satisfied that national networks infrastructure projects are sustainable and as aesthetically sensitive, durable, adaptable and resilient as they can reasonably be (having regard to regulatory and other constraints and including accounting for natural hazards such as flooding).'

6.4.31 NPSNN paragraph 4.34 accepts this point, but also recognises that:

> '…there may be opportunities for the applicant to demonstrate good design in terms of siting and design measures relative to existing landscape and historical character and function, landscape permeability, landform and vegetation.'

6.4.32 NPSNN paragraph 4.35 advises that:

> 'Applicants should be able to demonstrate in their application how the design process was conducted and how the proposed design evolved.'

6.4.33 The same points are made in respect of energy infrastructure projects in paragraphs 4.5.1, 4.5.3 and 4.5.4 of NPS EN-1 and paragraphs 4.6.1, 4.6.3 and 4.6.4 of the draft NPS EN-1.

6.4.34 In accordance with these paragraphs, a Project Design Report (Application Document 7.4) has been prepared in support of the DCO application that sets out how design of the Project has been an integral part of the design development in line with the requirements of Design Manual for Roads and

Bridges (DMRB) GG 103 Introduction and General Requirements for Sustainable Development and Design (Highways England, 2019). The Project Design Report also sets out the background to the Project, the policy context of the preliminary design approach and design rationale, demonstrating compliance with paragraph 4.35 of the NPSNN.

6.4.35 Design Principles (Application Document 7.5) have also been prepared in support of the DCO Application. They establish the principles to be met in the detailed design phase, supplementing the requirements and guidance within National Highways' DMRB.

6.4.36 As set out in the Project Design Report (Application Document 7.4), good design, including landscape design, is an essential focus of the Project. In seeking good quality design in all areas within the physical constraints associated with a highway infrastructure project of this nature, the following strategies have been developed to ensure design quality:

a. Developing designs in an integrated team;

b. Public consultation and stakeholder engagement;

c. Independent design review;

d. Incorporating flexibility for future development.

6.4.37 An independent design review was undertaken by National Highways' Design Review Panel (NHDRP) made up of experts in transport and traffic planning, structural and civil engineering, architecture, urban design, landscape architecture, environmental sustainability, public art and design.

6.4.38 The engagement with NHDRP played a significant part in helping shape the design, starting with the design narrative (which was subsequently shared with Project Stakeholders for review and comment). The design narrative and comments received have influenced the Preliminary Design during early stages of design development. Volumes B and C of The Project Design Report (Application Document 7.4) detail the comments from NHDRP and responses to those comments and how they have influenced the Project's design.

6.4.39 That engagement has also been used to influence and establish the Design Principles (Application Document 7.5).

6.4.40 The Project Design Report (Application Document 7.4) sets out that the preliminary design for the Project has as much as reasonably practicable developed to be:

a. Landscape led – noting that the Project lies within Green Belt (with the exception of the tunnels under the River Thames) as well as landscapes of exceptional value and variety, the design has been developed to be as green and sympathetic to its context as far as reasonably practicable. The design of architectural elements has reflected the nature of the character area while being recognisable as part of the Project.

b. Celebrate key moments, differences and thresholds – for the different people using the Project, the Project route would be characterised by key moments of transition through the varied landscape, made coherent by an underlying narrative which draws from its context and function.

c. Smarter by design – following the best approach to design by working collaboratively to designing elements of the Project that are multi-functional. Mitigation measures have been developed to meet a variety of environmental needs and to be embedded into the engineering design. Engineering proposals have also been designed to enhance rather than detract from the local environment where practicable.

d. Safe, resilient and easy to use – to serve its strategic transport objectives, the Project has been designed and built to make the operation, management and maintenance as easy as reasonably practicable, and meet ambitious safety targets within three years of opening in order to achieve National Highways' 2041 strategic goals on safety. It has been designed to be resilient to flood risk and climate change, and to be robust, attractive and durable – considering solutions that represent the best value over the whole life of the Project and are proportionate.

6.4.41 With specific regard to the design of the Energy NSIP aspects of the Project, the main considerations of design relate to the proposed re-routing of the overhead electricity lines, known as Work No OH7. The design options for that aspect of the Project reflect National Grid's guidance documents 'Our approach to the Design and Routeing of New Electricity Transmission Lines', 'Our approach to Options Appraisal' and 'National Grid's Commitments when undertaking works in the UK'. The options also seek to meet all relevant technical specifications and to avoid / minimise impacts on known ecological, historic, landscape & visual and socioeconomic constraints. They also reflect the 'Holford Rules' as set out in NPS EN-5 and, in so far as relevant to this Project, the Horlock Rules contained in the draft NPS EN-5 (See Appendix B to this Planning Statement).

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6.4.42 The Project there complies with the NPSNN and the Energy NPSs as a result of its consideration and integration of good design as detailed in the Project Design Report (Application Document 7.4) and its commitments for the detailed design stage as encapsulated in the Design Principles (Application Document 7.5).

Climate change adaptation

6.4.43 NPSNN paragraph 4.38 notes that, in view of the importance of the effects of climate change, new development should be capable of adapting to the effects that are occurring already:

> 'New development should be planned to avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the provision of green infrastructure'.

6.4.44 NPSNN paragraph 4.40 states:

> 'New national networks infrastructure will be typically long-term investments which will need to remain operational over many decades, in the face of a changing climate.'

6.4.45 Accordingly, it advises, 'that applicants must consider the impacts of climate change when planning location, design, build and operation.'

6.4.46 This text is replicated in paragraph 4.8.5 of the NPS EN-1 and 4.9.6 of the draft NPS EN-1.

6.4.47 NPSNN paragraph 4.41 goes on to say:

> 'Where transport infrastructure has safety-critical elements and the design life of the asset is 60 years or greater, the applicant should apply the UK Climate Projections 2009 (UKCP09) high emissions scenario (high impact, low likelihood) against the 2080 projections at the 50% probability level.'

6.4.48 Similar requirements are replicated at paragraph 4.8.9 of NPS EN-1 and paragraph 4.9.10 of the draft NPS EN-1.

6.4.49 Paragraphs 4.44 to 4.47 of the NPSNN explain the approach Applicants and the SoS should take in proposing, assessing and implementing any climate change adaptation measures.

6.4.50 In accordance with NPSNN paragraphs 4.40 and 4.41, ES Chapter 15: Climate (Application Document 6.1) has demonstrated the application of the updated UK Climate Projections 2018 (UKCP18) during the estimated lifetime of the Project, presenting information on the mitigation and adaptation measures related to the vulnerability of the Project to climate change. A climate resilience impact and effects risk assessment has been carried out and is presented in ES Appendix 15.3 (Application Document 6.3). The assessment has considered any potentially critical features of the design which may be seriously affected by climate change beyond what has been projected in UKCP18 (Met Office, 2019).

6.4.51 In accordance with NPSNN paragraphs 4.45 and 4.46, ES Chapter 14: Road Drainage and the Water Environment (Application Document 6.1) provides details of the flood risk assessment carried by the Applicant. ES Appendix 14.6: Flood Risk Assessment (FRA) (Application Document 6.3) has included the application of climate change allowances, as agreed with the Environment Agency, to ensure flood mitigation and alleviation measures are robust and resilient. Details of agreed climate change allowances and strategies for managing residual flood risk are provided in Part 6 of Appendix 14.6: FRA.

6.4.52 The findings of the flood modelling have informed the Project design to ensure its resilience to predicted climate change effects on river flows and water levels in the Thames Estuary. Climate change effects on rainfall intensity and groundwater resources have also been considered in the design of the Project. ES Appendix 14.6: FRA (Application Document 6.3) concludes that there are no significant adverse effects relating to flood risk (to and from the Project) during construction and operation of the Project. Once operational there would be a significant beneficial effect in the Mardyke west catchment because of the Project through the proposed reduction in discharge rates. ES Chapter 15: Climate (Application Document 6.1) also concludes that the Project is resilient to future climate change and there are no likely significant effects reported.

6.4.53 In accordance with the NPSNN paragraphs 4.38 to 4.46, ES Chapter 14: Road Drainage and Water Environment, and Chapter 15: Climate (Application Document 6.1) have set out how the Project would take account of the

projected impacts of climate change in relation to impacts of extreme weather and flood risk alongside reduction in impacts and adaptation.

Pollution control and other environmental protection regimes

6.4.54 As set out in NPSNN paragraph 4.48 (and NPS EN-1, paragraph 4.10.1 and draft NPS EN-1, paragraph 4.11.1), additional permissions may be required for discharges or emissions that affect air quality, water quality, land quality and the marine environment or which include noise and vibration. Paragraph 4.49 of the NPSNN (4.10.2 of the NPS EN-1) explains the differences between the planning and pollution control system in terms of what they seek to achieve and how they operate. Paragraph 4.50 of the NPSNN (4.10.3 of the NPS EN-1) notes that the DCO decision making process is concerned with the acceptability of the use of land and the impacts of that use rather than the control of processes, emissions or discharges and that:

> 'Decisions under the Planning Act should complement but not duplicate those taken under the relevant pollution control regime.'

6.4.55 Paragraph 4.52 of the NPSNN (4.10.4 of the NPS EN-1) explains the statutory duty on Applicants to consult the MMO on relevant projects. Paragraph 4.53 of the NPSNN (4.10.5 of the NPS EN-1) deals with the process for applicants applying for Environmental Permits and advises that the Examining Authority may wish to seek the views of the relevant permitting authority prior to reaching a decision on a DCO application. Paragraph 4.54 of the NPSNN (4.10.6 of the NPS EN-1) encourages applicants to begin early pre-application discussions with the Environment Agency. The Applicant evidences these extensive discussions in the Statement of Common Ground prepared with the Environment Agency. (Application Document 5.4.1.1)

6.4.56 In regard to pollution control and other environmental protection regimes, the Applicant is in discussion with the relevant stakeholders to agree the drafting of powers as expressed in the draft DCO (Application Document 3.1). This would provide development consent for the works associated with the Project and includes some other consents and powers. The DCO application is supplemented by applications for a number of other permits, consents and agreements that need to be sought separately from the DCO, these are detailed in the Consents and Agreements Position Statement as set out in Appendix A (Application Document 3.3). Agreements with the consenting bodies, including the Environment Agency, Natural England, local authorities, the Marine Management Organisation (MMO) and the Port of London Authority are being taken forward through the submission of draft Statements of Common Ground with the DCO Application (Application Document 5.4) and protective provisions in the draft DCO (Application Document 3.1).

6.4.57 The Consents and Agreements Position Statement Appendix A (Application Document 3.3) identifies the water Environmental Permits that are required to be obtained separately through the Environment Agency, subsequent to any grant of the Development Consent Order (DCO). Discussions between National Highways and the Environment Agency have been ongoing, with a number of permits to be obtained by the Contractors in due course in view of the information to be provided at that time.

Common law nuisance and statutory nuisance

6.4.58 Paragraphs 4.57 to 4.59 of the NPSNN and 4.14.1 to 4.14.3 of both NPS EN-1 and the draft NPS EN-1 require that a DCO application for a national networks scheme should consider how possible sources of statutory nuisance under section 79(1) of the Environmental Protection Act 1990 may be mitigated or limited.

6.4.59 The Statement of Statutory Nuisance (Application Document 6.6) identifies possible sources of nuisance under section 79(1) of the Environmental Protection Act 1990, setting out how these are to be limited or mitigated.

Safety

6.4.60 The safe design, construction and operation of the Project is fundamental. NPSNN paragraphs 4.60 and 4.61 reflect this. Paragraph 4.62 requires applicants to undertake '*the road safety audit process. Road safety audits are a mandatory requirement for all trunk road highway improvement schemes in the UK (including motorways).'* NPSNN paragraph 4.64 requires the Applicant to demonstrate that all reasonable steps have been taken to ensure that the Project minimises the risk of death and injury, reduces road casualties and incidents, and improves road safety for walkers and cyclists.

6.4.61 In accordance with paragraph 4.65 and 4.66 of the NPSNN the Applicant has placed safety at the heart of the Project from its inception through to the Project design submitted for DCO consent and consideration for construction and maintenance of the Project. These are set out below.

6.4.62 In relation to the construction phase, specific measures to ensure the safety of workers are set out in the Code of Construction Practice (CoCP) (Application Document 6.3, Appendix 2.2). Chapter 5 of the CoCP requires the Contractors to produce a construction logistics plan which would contain community safety strategy. The community safety strategy would include measure to ensure that vehicles routes are planned, and construction compounds are managed to reduce the risk to vulnerable road users.

6.4.63 The Project has been developed in line with the stated aim of the National Highways Delivery Plan (2015-2020) that '*no-one should be harmed who builds, operates and maintains and uses the new road network, with a target for the number of people killed or seriously injured on the road network to be approaching zero by 2040*.' The Project plays a key role in achieving the Applicant's target.

6.4.64 Set against that context, and in relation to the operational phase, the design of the Project has been guided by relevant technical standards, in particular the DMRB. This forms the basis of highway safety design which seeks to minimise the risk of road casualties arising from highway schemes and contribute to an overall improvement in the safety of the SRN.

6.4.65 In particular, the safety of road users has been considered as part of developing the preferred route option and design of the Project, including mitigation measures and safety benefits, such as:

a. Modern safety measures and construction standards with technology to manage traffic and provide better information to drivers.

b. Variable Message Signs to display variable speed limits, travel information, hazard warnings and both advisory and mandatory signage to drivers.

c. CCTV cameras to monitor, manage and investigate incidents, maintenance, network usage, to detect stopped vehicles and for asset protection and the prevention and detection of crime.

d. Above ground traffic detection to control automatic traffic management systems (e.g. variable speed limits) and to collect data on traffic flows.

e. Free-flow charging infrastructure.

f. Equipment within the tunnel to monitor and control the tunnel environment during normal and emergency operations.

g. Provision on vehicle refuge spaces in line with current standards.

6.4.66 The design of the Project has been developed in close coordination with the Emergency Services. National Highways has made a commitment in the CoCP (Application Document 6.3, Appendix 2.2) to liaise with the emergency services in the preparation and submission for approval of the Environmental Management Plan (in accordance with Schedule 2, Requirement 4 of the draft DCO (Application Document 3.1) and Traffic Management Plan for Construction (in accordance with Scheduled 2, Requirement 10 of the draft DCO (Application Document 3.1). For detailed design, consultation with the emergency services would be through the provisions of the DMRB CD 352 Design of Road Tunnels (Highways England, 2020) Tunnel Design and Safety Consultation Group (TDSCG) process. Further information on the Applicants engagement with the emergency services with respect to the Project is set out in the Statement of Common Ground between National Highways and the Emergency Services and Safety Partnership Steering Group (Application Document 5.4.4.4).

6.4.67 Table 9.5 in Part 2 of the TA (Application Document 7.9) sets out the reduction in the accident rate (accidents per vehicle kilometre travelled) in the area over a 60-year appraisal period from the opening year (2030-2090).

6.4.68 In accordance with paragraph 4.63, the Applicant has undertaken an objective assessment of the impact of the Project on safety, as reported in Chapter 9 of the Transport Assessment (Application Document 7.9). This uses the methodology outlined in the guidance from the Department for Transport (DfT) (TAG) and from National Highways.

6.4.69 A Road Safety Audit process has been put in place to demonstrate a rigorous process for monitoring and evaluating safety. An audit is carried out at four stages in the development of highway schemes starting with the completion of the preliminary design (stage 1 road safety audit), the completion of the final design (stage 2 road safety audit), at completion of construction (stage 3 road safety audit) and 12-months post-opening of the operation of the scheme (stage 4 road safety audit).

6.4.70 The preliminary design of the Project has been subject to a Stage 1 Road Safety Audit. Stage 2 and 3 Road Safety Audits would be carried out following detailed design and construction of the Project. A Stage 4 Road Safety Audit

would be carried out 12-months post Project operation using validated collision data.

6.4.71 A Plan for Monitoring Operations (PfMO) would be implemented to determine whether the Project is operating in an effective and safe manner during the initial period of operation. A Post Opening Project Evaluation (POPE) would be carried out for the Project 1 year after opening to evaluate the safety of the Project and whether it meets the original set of Scheme Objectives.

6.4.72 In accordance with paragraph 4.63 of the NPSNN relating to road safety for walkers and cyclists the Project is designed to prohibit use by vulnerable road users such as walkers, cyclists and horse riders (WCH) along with slower vehicles such as mobility scooters in view of safety concerns. However, the Project includes improvements to the PRoW network which provides an alternative safe provision and reduces severance caused by the Project road. ES Chapter 13: Population and Human Health (Application Document 6.1) states that the Project would adhere to sustainability principles in its delivery by improving the connectivity of communities and providing additional opportunities for recreation through improvements to the local WCH routes therefore contributing to road safety through encouraging vulnerable users to use the alternative routes.

6.4.73 In accordance with paragraph 5.64 of the NPSNN, all steps have been taken by National Highways through the design of the Project that are reasonably required in order to:

a. minimise the risk of death and injury arising from their development

b. contribute to an overall reduction in road casualties

c. contribute to an overall reduction in the number of unplanned incidents

d. contribute to improvements in road safety for walkers and cyclists.

6.4.74 With regard to the energy infrastructure aspects of the Project, NPS EN-1 addresses the matter of safety by requiring applicants to undertake early engagement with relevant competent bodies such as the Health and Safety Executive (HSE) and the Environment Agency (EA) (paragraphs 4.11.1, 4.11.3 and 4.11.4). This engagement has been undertaken as described in Application Document 5.2 (Statement of Engagement), matters under discussion agreed and not agreed are reported in the relevant Statement of Common Ground (Application Documents 5.4). The necessary control measures are secured through the CoCP (Application Document 6.3) under Schedule 2 of the draft DCO (Application Document 3.1) and the relevant protective provisions secured in Schedule 14 of the draft DCO.

Security considerations

6.4.75 Paragraph 4.76 of the NPSNN states that:

> ‘Where national security implications have been identified, the applicant should consult with relevant security experts from CPNI and the Department for Transport, to ensure that physical, procedural and personnel security measures have been adequately considered in the

design process and that adequate consideration has been given to the management of security risks.'

6.4.76 The same text is presented at paragraph 4.15.3 of both NPS EN-1 and draft NPS EN-1 other than it requires consultation with the Office for Civil Nuclear Security and the Department for Energy & Climate Change (DECC) (as was) rather than the Department for Transport.

6.4.77 National Highways has liaised with the Department for Transport (DfT) on the approach to security taken by the Project ahead of the DCO being submitted. The DfT understands, and has confirmed in writing, that security issues have been adequately addressed in the Project by National Highways and through engagement with the DfT and the Centre for the Protection of National Infrastructure (CPNI). DfT agrees that regular communication on security should continue between National Highways, the Department and the CPNI outside the DCO Examination process. Accordingly, the Examining Authority should not need to give any further consideration to the details of the security measures during the Examination.

Health

6.4.78 In accordance with paragraph 4.81 of the NPSNN, the Health and Equalities Impact Assessment (HEqIA) (Application Document 7.10) sets out the likely effects of the Project on human health and equalities as well as proposed mitigation measures to avoid, reduce or remediate such potential impacts.

6.4.79 Tables 8.1 and 8.2 of the HEqIA (Application Document 7.10) set out a summary of the health outcomes and equalities effects of the Project during the construction and operation phases as well as a summary of the proposed mitigation. The summary identifies a mixture of positive, neutral and negative effects. The negative effects are experienced primarily during construction and relate to sensitive populations affected as a result of changes in accessibility, severance, access to green space and outdoor recreation, noise and vibration, housing and mental health and wellbeing. Positive effects are also anticipated during construction (for example as a result of work and training opportunities) and more so during operation where the negative effects are limited to the topics of noise and vibration and mental health and wellbeing.

6.4.80 Paragraph 4.82 of the NPSNN provides that:

'The applicant should identify measures to avoid, reduce or compensate for adverse health impacts as appropriate.'

6.4.81 Paragraph 4.79 of the NPSNN makes clear that projects can have a direct impacts on health as a result of *'traffic, noise, vibration, air quality and emissions, light pollution, community severance, dust, odour, polluting water, hazardous waste and pests.'*

6.4.82 The same sentiments are expressed in paragraphs 4.13.1 to 4.13.5 of NPS EN-1 and 4.3.1 to 4.3.5 of draft NPS EN-1 in respect of energy infrastructure.

6.4.83 In accordance with those paragraphs, Section 4.4 of the HEqIA sets out the Project commitments to mitigation, identifying three categories:

a. Embedded mitigation: measures that form part of the engineering design, developed through the iterative design process.

b. Good practice: standard approaches and actions commonly used on infrastructure development projects to avoid or reduce environmental impacts, and typically applicable across the whole Project.

c. Essential mitigation: any additional Project-specific measures needed to avoid, reduce or offset potential impacts that could otherwise result in effects considered significant in the context of the EIA Regulations. Essential mitigation has been identified by environmental topic specialists, taking into account the effect of embedded mitigation and good practice mitigation.

6.4.84 Embedded mitigation is included within the Design Principles (Application Document 7.5). Good practice and essential mitigation are included in the CoCP (Application Document 6.3, ES Appendix 2.2) and the REAC (Application Document 6.3, ES Appendix 2.2).

6.4.85 The HEqIA outlines the beneficial impact of a number of new/improved WCH routes and the wider benefits that this accessibility brings to communities in terms of access to open space. New facilities as part of the Project design for WCH would also help to improve connectivity and increase opportunities for active travel and levels of physical activity.

6.5 Generic impacts accordance

Introduction

6.5.1 Section 5 of both the NPSNN and NPS EN-1 identify a range of impacts which would be relevant to any national networks and any energy infrastructure, regardless of the type of infrastructure under consideration. As there is a large degree of consistency between the generic impacts identified in the NPSNN and NPS EN-1 they are dealt with together in this section of the Planning Statement with references given to the text of both NPSs as appropriate. Section 6.6 which follows deals separately with a number of additional requirements of NPS EN-1 (and other Energy NPSs and the draft revisions to the Energy NPSs) which do not feature in the NPSNN.

Air quality

6.5.2 NPSNN paragraph 5.3 acknowledges national networks can bring about a worsening or beneficial effect on local air quality due to changes in emissions during construction and operation. It explains at paragraph 5.4 that air quality legislation sets out human health and eco-system based objectives and Limit Values for the main pollutants in the Ambient Air Quality Directive (2008/50/EU). It acknowledges at paragraph 5.5 that the development of road schemes can create complex challenges with regard to air quality, as the geographical extent of effects can cover a large area beyond the boundary of the individual scheme.

6.5.3 Accordingly, ES Chapter 5: Air Quality (Application Document 6.1) considers the impacts at receptors near the Application Site and across the Affected Road Network (ARN) which covers a much wider area (see ES Figures 5.1, 5.2 and 5.3 (Application Document 6.2)).

6.5.4 Paragraphs 5.7 to 5.8 go on to set out the methodological requirements for this assessment, which the air quality assessment reported in ES Chapter 5: Air Quality (Application Document 6.1) has followed. In accordance with these paragraphs, the assessment of air quality effects contained within Section 5.6 of ES Chapter 5 has been informed by air quality monitoring and modelling of existing air quality, and modelling of the construction and operational phase with and without the Project.

6.5.5 In acknowledging the provisions within NPSNN paragraph 5.9, the ES has considered the significance of effects of the Project and has concluded that the Project results in a significant air quality effect because of an increase in nitrogen deposition in ecological designated sites. A compliance risk assessment has been undertaken which concludes that there is no risk to the reported date of compliance with the Air Quality Directive.

6.5.6 NPSNN paragraph 5.10 provides the SoS must take account of relevant statutory air quality thresholds set out in domestic and European legislation. Where a project is likely to lead to a breach of the air quality thresholds, the applicant should work with the relevant authorities to secure appropriate mitigation measures with a view to ensuring so far as possible that those thresholds are not breached. The NPSNN requires particular consideration of areas with Air Quality Management Areas (as per paragraph 5.11).

6.5.7 The ES therefore sets out the location of AQMAs in the wider area with the potential to be impacted by the Project (see ES Figures 5.2 and Figure 5.3 (Application Document 6.2)). In addition, air quality effects have been considered in relation to Air Quality Strategy objectives and Limit Values for NO_2, PM_{10} and $PM_{2.5}$ which are shown in Table 5.4 of ES Chapter 5: Air Quality (Application Document 6.1).

6.5.8 NPSNN paragraph 5.12 states:

> '*The Secretary of State must give air quality considerations substantial weight where, after taking into account mitigation, a project would lead to a significant air quality impact in relation to EIA and / or where they lead to a deterioration in air quality in a zone/agglomeration.*'

6.5.9 Paragraph 5.13 further provides that the SoS should refuse consent where, after taking into account mitigation, the air quality impacts of the scheme will result in a zone/agglomeration which is currently reported as being compliant with the Air Quality Directive becoming non-compliant or affect the ability of a non-compliant area to achieve compliance within the most recent timescales reported to the European Commission at the time of the decision.

6.5.10 In this context of both paragraph 5.12 and 5.13, it is to be noted that with future improvements in air quality (particularly for AQMAs designated due to road traffic, because, vehicle emissions will improve over time), it is anticipated that there will be fewer areas where the NO_2 AQS objective is exceeded across the study area by the Project's opening year. In addition, as set out below, the ES has concluded that the Project results in a significant air quality effect due to an increase in nitrogen deposition in ecological designated sites. A compliance risk assessment has also been undertaken which concludes that there is no risk to the reported date of compliance with the Air Quality Directive.

Impact on human receptors

6.5.11 Taking into account the implementation of good practice measures in the Register of Environmental Actions and Commitments (REAC), which forms part of Appendix 2.2: CoCP (Application Document 6.3) and the predicted changes in air quality during construction and operation, no potential for likely significant effects on human receptors were identified.

6.5.12 There are 25 human health receptors where an exceedance of the annual mean NO_2 AQS objective and a perceptible change in NO_2 (i.e. >0.4µg/m^3) are predicted in the Project opening year, and these are confined to worst-case receptors on the A282 Dartford Crossing (one medium and three small NO_2 improvements), M25 between junction 25 and junction 26 near Holmesdale Tunnel (seven small NO_2 improvements), A2 London Road (four small NO_2 worsenings) and A228 between M20 junction 4 and M2 junction 2 (five small NO_2 improvements and one large, four medium worsenings). These are summarised within Table 5.35 of ES Chapter 5: Air Quality (Application Document 6.1).

6.5.13 The one large worsening of air quality is just within the large magnitude range and is at the bottom of the large magnitude guideline band in DMRB LA 105 Air Quality (Highways England, 2019). Furthermore, the impact and concentrations are likely to be overpredicted at this receptor as well as other receptors on the A228 as explained in paragraph 5.6.135 of ES Chapter 5: Air Quality (Application Document 6.1).

6.5.14 There are no predicted exceedances of AQS objectives/Limit Values for PM_{10} or $PM_{2.5}$. Furthermore, the Project is not expected to affect the UK's ability to comply with the Air Quality Directive (Directive 2008/50/EC) in the shortest possible timescales

6.5.15 ES Appendix 5.4 Air Quality Operational Phase Results presents the predicted change in NO_2, PM_{10} and $PM_{2.5}$ for all receptors and shows that the operation of the Project would result in both improvements and deteriorations in local air quality as a result of Project-associated changes in traffic flows. There is expected to be a reduction in NO_2 and PM_{10} concentrations by the time the Project is operational, in response to improvements in vehicle emissions over this period. It is therefore considered that these impacts do not weigh against the Project under paragraphs 5.12 and 5.13 of the NPSNN.

Impact on ecological receptors

6.5.16 With regards to ecological receptors, an assessment of ecological designated sites within 200m of the construction and operation ARN is reported in ES Appendix 8.14 (Application Document 6.3). This assessment has had regard to additional environmental compensation measures proposed to compensate for the effects of nitrogen deposition on designated habitats over the operational phase.

6.5.17 The effects of the Project on European designated sites over the construction and operational phases are considered in the Habitats Regulations Assessment (HRA) Report (Application Document 6.5). The HRA Report concludes that (having regard to the development design), the construction and operation of the Project alone or in combination with other plans and projects would not result in likely significant effects on the North Downs Woodlands SAC or

Thames Estuary and Marshes Ramsar site and does not prevent the achievement of the conservation objectives of Epping Forest SAC and consequently no adverse effect on the integrity of this site is predicted to occur.

6.5.18 ES Appendix 8.14 presents the assessment of nitrogen deposition impacts on designated sites. These assessments have been included within the range of factors which have informed the mitigation measures set out below including the Project Air Quality Action Plan (PAQAP), the proposed mitigation option (M2 speed enforcement) and the proposed compensation sites. Having regard to those measures the ES concludes that the Project does lead to a significant air quality effect on designated habitats as a result of changes in nitrogen deposition.

6.5.19 With regards to mitigation, NPSNN paragraph 5.14 states that:

> '*The Secretary of State should consider whether mitigation measures put forward by the applicant are acceptable. A management plan may help codify mitigation at this stage. The proposed mitigation measures should ensure that the net impact of a project does not delay the point at which a zone will meet compliance timescales.*'

6.5.20 In relation to mitigation and compensation NPSNN paragraph 5.15 further provides that:

> '*Mitigation measures may affect the project design, layout, construction, operation and/or may comprise measures to improve air quality in pollution hotspots beyond the immediate locality of the scheme. Measures could include, but are not limited to, changes to the route of the new scheme, changes to the proximity of vehicles to local receptors in the existing route, physical means including barriers to trap or better disperse emissions, and speed control. The implementation of mitigation measures may require working with partners to support their delivery.*'

6.5.21 In accordance with paragraph 5.14 and 5.15 of the NPSNN, Section 5.5 of ES Chapter 5: Air Quality (Application Document 6.1) describes the various mitigation measures in relation to air quality which are included in the Register of Environmental Actions and Commitments (REAC), which forms part of ES Appendix 2.2: CoCP (Application Document 6.3). These include the following:

a. Measures to reduce vehicle and plant emissions (REAC Ref. AQ001)

b. Measures to reduce dust during demolition works (REAC Ref. AQ002)

c. Measures to reduce dust during earthworks and construction (REAC Ref. AQ003)

d. Measures to reduce dust from trackout (REAC Ref. AQ004)

e. Dust management good practice (REAC Ref. AQ005)

f. Air Quality monitoring during construction (REAC Ref. AQ006)

g. Actions in case of air quality monitoring exceedance (REAC Ref. AQ008)

6.5.22 In addition, in accordance with NPSNN paragraph 5.14 and as a result of the determination of significance of Nitrogen Deposition impacts on the ecological

sites within the affected route network (ARN) in ES Appendix 8.14, a PAQAP has been produced (ES Appendix 5.6 (Application Document 6.3). It has been informed by consultations undertaken with Natural England, the Kent Downs AONB Unit, Forestry Commission, Forestry England and members of the public.

6.5.23 The measures proposed within the PAQAP do not eliminate the significance of effect on all the designated habitats and the ES therefore concludes that the Project leads to a significant air quality effect over the operational phase. The PAQAP considers whether there is a reasonable alternative which would avoid the effect, whether feasible mitigation measures are available and what compensation should be provided. The various measures which have been subject to a site by site selection and assessment of feasibility are extensive (including physical barriers, speed limit reductions and pollutant scrubbing).

6.5.24 Compensation sites, which compensate for the Nitrogen Deposition impacts on the ecological sites, selected for habitat creation are listed in the PAQAP as shown in Table 6.2 below.

Table 6.2 Nitrogen deposition compensation sites

Compensation site name (location)	Size (ha)	Details
Hole Farm East	75.2	Located within Brentwood. Site owned by National Highways.
Buckingham Hill	24.4	Site located within Thurrock. Former landfill site owned by Thurrock Council.
Hoford Road	21.6	Privately owned land located in Thurrock, located south of Orsett Golf course.
Henhurst Hill	9.1	Most western site within the Gravesham/Shorne cluster. Site is privately owned and currently farmed. Located south of the A2, close to Ashenbank Woods and Jeskyns community woodland.
Fenn Wood	5.8	Privately owned site which appears to be used for horse grazing, located south of Shorne Village adjacent to Fenn Wood.
Court Wood	27.7	Privately owned site agricultural land located in Shorne, in between Starmore Wood and Court Wood.
Blue Bell Hill	43.2	Privately owned site located south of M2 in Blue Bell Hill.

Extract from Table 7.7 Project Air Quality Action Plan (PAQAP) (ES Appendix 5.6: (Application Document 6.1)

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6.5.25 The above sites have been identified due to their size and proximity to several affected designated habitats, as well as other designated sites that are not impacted by the Project and would involve the creation of significant new areas of wildlife-rich habitats, along with smaller areas that connect habitats that have previously been fragmented.

6.5.26 The sites fall within the Order Limits and are included within the Environmental Management Plan (Application Document 6.2, Figure 2.4) which would be legally secured though draft DCO Requirement 5. They are also referred to in Design Clauses LSP.27, S1.18, S14.13 of the Design Principles Document (Application Document 7.5) which (amongst other things) requires that alongside new planting arrangements*, 'Existing watercourses flowing through,*

or bordering the sites would not be physically disturbed, including a riparian corridor of a minimum width of 8m. Any ponds or other waterbodies would be retained. During the management of vegetation and landform the Project would reduce release of diffuse sources of pollution such as nitrate (fertilisers) and pesticides (including herbicides) to prevent groundwater and surface water pollution.' The various measures included within the Design Principles Document would be legally secured through Requirement 3 of the draft DCO (Application Document 3.1).

6.5.27 For completeness, in accordance with paragraph 5.15 of the NPSNN, Chapter 4 of this Planning Statement describes the route selection process and subsequent design evolution undertaken since 2009 when an initial six route corridors were identified in the DfT report. From the outset air quality has been one of a number of factors which have influenced the consideration of alternatives and the assessment of options in terms of their performance against the Scheme Objectives (particularly in relation to minimising adverse impacts on health and the environment).

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Summary

6.5.28 The compliance risk assessment undertaken in line with the Air Quality Directive presented in Section 5.6 of ES Chapter 5: Air Quality (Application Document 6.1) concluded that there is no risk to the reported date of compliance with the Directive (i.e. the Project does not cause a compliant zone to become non-compliant, or affect the ability of a non-compliant area to achieve compliance within the most recent timescales reported). The Project does not, therefore, breach the criteria set out at paragraph 5.13 of the NPSNN.

6.5.29 Importantly, NPSNN paragraph 3.8 also acknowledges that the impacts of road development need to be weighed against significant projected improvements in air quality as a result of current and future policies to meet the Government's legally binding carbon budgets and the European Union's air quality limit values and that any increases in emissions need to be seen in the context of projected reductions over time.

6.5.30 The Project would not lead to a significant air quality effect on human health but has, however, been assessed to lead to a significant air quality effect on designated habitats as a result of changes in nitrogen deposition, including after consideration of the mitigation measures outlined in the Project Air Quality Plan (Appendix 5.6: Project Air Quality Action Plan (Application Document 6.3)). In accordance with paragraphs 5.12 of the NPSNN it is acknowledged that the SoS must give air quality considerations substantial weight where a project would lead to a significant air quality impact. The identification of proposed nitrogen deposition compensation areas with associated planting aim, however, to provide permanent compensation for these effects.

6.5.31 The Project would deliver improvements in air quality in some locations, such as around the Dartford crossing as a result of the relief of congestion. The Project road would provide a free-flowing crossing of the River Thames and the provision of mitigation and compensation measures to address the identified impacts on ecological sites in particular.

6.5.32 Having regard to these considerations, the Project would accord with the policies relating to air quality in the NPSNN.

Carbon

6.5.33 Paragraph 3.6 of the NPSNN notes the importance of transport in meeting Government's legally binding carbon targets. Paragraph 3.8 of the NPSNN notes that the impact of road development on aggregate emission levels is likely to be very small, in respect of carbon, well below 0.1% of the average annual carbon emissions allowed in the fourth carbon budget.

6.5.34 NPSNN paragraph 4.40 requires applicants to consider the impacts of climate change when planning and designing transport infrastructure projects.

6.5.35 Paragraph 5.17 of the NPSNN goes on to acknowledge that individual projects are unlikely to impact on Government's ability to meet its carbon reduction targets. Nonetheless, applicants are required to provide evidence of the carbon impacts of projects.

6.5.36 Accordingly, NPSNN paragraph 5.18 notes that an increase in carbon emissions is not a reason to refuse consent unless that increase is so significant it would affect the ability of the Government to meet its carbon reduction targets.

6.5.37 Paragraph 5.19 requires applicants to provide evidence that appropriate mitigation measures have been incorporated into both the design and construction of projects.

6.5.38 In order to demonstrate accordance with the requirements of paragraph 5.19 of the NPSNN, ES Chapter 15: Climate (Application Document 6.1) presents an assessment of likely significant effects of the Project on climate, through its net greenhouse-gas emissions, during construction and operation. The assessment is a worst-case scenario to represent a maximum contribution to the UK carbon budgets. It considers the carbon impacts of the Project during the construction and operational phases and compares them to the Government's relevant carbon budgets, concluding that the Project would not have a material impact on the ability of Government to meet its carbon reduction targets.

6.5.39 ES Appendix 15.1: Climate Legislation and Policy (Application Document 6.3) explains how the development of the Project would accord with relevant Government plans and strategies supporting the Government's net zero commitments, as well as National Highways' own plan to achieve net zero emissions.

6.5.40 Although the climate assessment follows the DMRB LA 114 Climate (Highways England, 2021) appraisal standard, Section 6.2 of the Institute of Environmental Management & Assessment (IEMA) Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance provides a means of evaluating 'significance' in the context of residual Project carbon emissions, against the UK's carbon reduction targets. That guidance has been referenced by the SoS in a number of DCO decisions (e.g. the M25 Junction 10, the M25 Junction 28). The Applicant's approach to determining significance is consistent with that endorsed approach.

6.5.41 ES Chapter 15: Climate (Application Document 6.1) identifies that, when GHG emissions from the Project would be at their highest, most intense level (short-term construction activity), the Project would contribute no more than 0.058% of total emissions in any five-year carbon budget during which they arise.

6.5.42 The Applicant has produced a Carbon and Energy Management Plan (Application Document 7.19), which sets out how Project emissions have been quantified in the preliminary design phase, as well as setting out the measures that have been applied to reduce the Project's GHG emissions during both the construction and operational phases. It describes how the Applicant has included an unprecedented combination of commercially available, low carbon technology in the preliminary design, demonstrating a best practice approach to carbon reduction. The Applicant has committed to use the Project to test low carbon innovation and approaches, the Project would push the construction industry towards a net zero carbon trajectory, as set out in Appendix I (Carbon Strategy and Policy Alignment) of this Planning Statement.

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6.5.43 In acknowledging the objectives within the Government's overarching national carbon reduction strategy (referred to within NPSNN paragraph 5.18), the Carbon and Energy Management Plan (Application Document 7.19) explains that the Project has been designated a pathfinder project to explore low carbon construction and to support the Applicant's broader plan to become a Net Zero business. The Carbon and Energy Management Plan sets out a number of mechanisms that would continue to drive down carbon emissions through the detailed design and construction phase, including embedding carbon reduction in the construction stage through the procurement process to ensure that Contractors are bound to relevant commitments made as part of this application. These measures would be facilitated through the application of a verified PAS2080 carbon management system. An explanation of how they would be secured is set out at Table 2.1 of the Carbon and Energy Management Plan (Application Document 7.19).

6.5.44 Taken together, it is considered that evidence presented in ES Chapter 15: Climate (Application Document 6.1) and the Carbon and Energy Management Plan (Application Document 7.19) demonstrate accordance with the requirements of the NPSNN (paragraphs 4.40, 5.17 and 5.19) in relation to carbon. Appendix I: Carbon Strategy and Policy Alignment of this Planning Statement demonstrates how the NPSNN policy requirements have been both met and exceeded. The Carbon and Energy Management Plan would set new standards in best practice for carbon reduction in major civil engineering projects.

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Biodiversity

6.5.45 Both Terrestrial and Marine Biodiversity impacts are included in the ES as confirmed in the Scoping Opinion, which was received from the SoS on 13 December 2017. This is included within ES Appendix 4.1 (Application Document 6.3).

6.5.46 In accordance with NPSNN paragraph 5.22 consideration has been given to the potential effects of the Project on sites of nature conservation interest in ES Chapter 8: Terrestrial Biodiversity and Chapter 9: Marine Biodiversity (Application Document 6.1). This includes consideration of international, national and local nature conservation sites, areas of ancient woodland and habitats of principal importance. In addition, the Project has sought to avoid significant harm to features of biodiversity and geological interest through the assessment and selection of alternatives (See Chapter 5: Project Evolution and Alternatives of this Planning Statement and ES Chapter 3: Assessment of

Reasonable Alternatives (Application Document 6.1)) and through the assessment of impacts reported in ES Chapter 8: Terrestrial Biodiversity, and Chapter 9: Marine Biodiversity (Application Document 6.1).

6.5.47 Paragraph 5.26 of the NPSNN states that in taking decisions, the SoS should ensure that appropriate weight is attached to designated sites of international, national and local importance, protected species, habitats and other species of principal importance for the conservation of biodiversity, and to biodiversity and geological interests within the wider environment. Chapter 8: Terrestrial Biodiversity, and ES Chapter 9: Marine Biodiversity (Application Document 6.1) consider in detail the effects of the Project, during both construction and operation, upon international, national and locally designated sites, protected species and habitats, along with other species identified as being of principal importance for the conservation of biodiversity. This section presents a summary of impacts, mitigation and compliance with policy.

International designations

6.5.48 The requirements of the NPSNN and NPS EN-1 in relation to Habitat Regulations Assessment (HRA) are addressed within paragraphs 4.4.14 to 4.4.21 of this chapter under the heading of 'Assessment Principles'.

6.5.49 Within the NPSNN, paragraphs 4.22 to 4.25 (as referred to in paragraph 5.27 of the NPSNN) set out that prior to granting development consent the SoS should consider whether it is possible that a Scheme would have a significant effect on the objectives of a European site.

6.5.50 The baseline conditions reported in Section 8.4 of ES Chapter 8: Biodiversity (Application Document 6.1) identified the Thames Estuary and Marshes Ramsar designation as being located within the Order Limits and the Thames Estuary and Marshes SPA, North Downs Woodland SAC and Peter's Pit SAC within 2km of the Order Limits. Assessments specific to nitrogen deposition impacts also consider the Epping Forest SAC designation, which lies 14km from the Order Limits.

6.5.51 Further details of the European sites and a consideration of whether the Project is likely to have significant effects upon them are set out in the HRA Screening Report and Statement to Inform Appropriate Assessment (Application Document 6.5). The HRA assessment concluded concludes there would be no adverse effects on the integrity of any of the European sites. The Scheme is therefore in accordance with NPSNN paragraphs 4.22 to 4.25.

Statutory Nationally Designated Sites

6.5.52 Paragraphs 5.28-5.29 of the NPSNN set out that SSSIs should be given a high degree of protection and development consent should not normally be granted where a proposal would have an adverse effect on a SSSI but as addressed below, allows for certain exceptions.

6.5.53 Section 8.4 of ES Chapter 8: Terrestrial Biodiversity (Application Document 6.1) identifies, that out of the 13 sites which fall within the study area, there are 4 designated SSSIs within the Order Limits. These are presented within Table 8.8 and Table 8.19 of Section 8.4 of ES Chapter 8: Terrestrial Biodiversity (Application Document 6.1). Those which in part fall within or adjacent to the Order Limits are listed as follows:

a. Wouldham to Detling Escarpment SSSI (adjacent to Order limits)

b. South Thames Estuary and Marshes SSSI (within Order Limits)

c. Shorne and Ashenbank Woods SSSI (within Order Limits)

d. Great Crabbles Wood SSSI and ASNW (adjacent to Order Limits)

e. Mucking Flats and Marshes SSSI (within Order Limits)

6.5.54 Section 8.6 of ES Chapter 8: Terrestrial Biodiversity (Application Document 6.1) presents an assessment of the likely significant impacts of the Project on SSSI designations. The sites identified as being subject to significant adverse effects resulting from the Project are presented within Table 6.3 below.

Table 6.3 Summary of Likely Significant Effects upon SSSI designations detailed in Chapter 8: Terrestrial Biodiversity

Impact description	Importance	Level of impact	Effect
Permanent habitat loss at Shorne and Ashenbank Woods SSSI, including the loss of ancient woodland, totalling 5.85ha (construction phase impact)	National	Minor	Moderate adverse
Effects of nitrogen deposition on statutory designated habitats: Cobham Woods SSSI; Halling to Trottiscliffe Escarpment SSSI; Shorne and Ashenbank Woods SSSI; Wouldham to Detling Escarpment SSSI (operational phase impact).	National	Moderate to major	Moderate to large adverse

Extracted from Table 8.40 of ES Chapter 8: Terrestrial Biodiversity

6.5.55 The identified habitat loss during construction and nitrogen deposition impacts during operation are discussed in detail in ES Appendix 8.6 and summarised in Section 8.6 of Chapter 8: Terrestrial Biodiversity (Application Document 6.1). These assessments conclude that habitat loss from Shorne and Ashenbank Woods SSSI, including ancient woodland, whilst having consideration for the proposed compensatory planting, would result in a residual significant adverse effect. Changes in nitrogen deposition over the construction phase are not likely to affect SSSI designations, having regard to the temporary nature of construction impacts and the fact that nitrogen deposition effects are cumulative over time. Over the operational phase, however, as outlined above, the Project has a significant air quality effect on four SSSI sites because of an increase in nitrogen deposition (notwithstanding the various mitigation and compensatory measures that are proposed).

6.5.56 The potential for adverse effects on SSSIs was taken into consideration during the route options selection process as one of a number of criteria (as explained at Chapter 5: Project Evolution and Alternatives of this Planning Statement). It has been demonstrated through this process and the development of the route following PRA that it would not be feasible to deliver the Scheme Objectives and also completely avoid direct and indirect effects upon SSSI designations. In

particular, it became apparent as the design developed that there was very limited opportunity with the Eastern Southern Link (previously part of the preferred route option) to reduce impacts upon SSSI. This is set out in detail within paragraphs 4.4.91 to 4.4.99 of Chapter 4). Following the Statutory Consultation in 2018 further changes were made to the Project design to minimise the footprint of the road through Shorne Woods SSSI and a large number of options for the design of utilities diversions at the M2/A2/A122 Lower Thames Crossing junction and A2 corridor were also assessed. Through undertaking this process although it was established that in all cases this part of the route would unavoidably impact upon Shorne and Ashenbank Woods SSSI.

6.5.57 Having regard to the design development, along with the various mitigation and compensatory measures proposed over both the construction and operational phase (as outlined in Section 8.5 of ES Chapter 8: Terrestrial Biodiversity (Application Document 6.1)) the design has sought to reduce both direct and indirect impacts upon SSSI designations as far as practicable. As outlined above, the loss of SSSI habitat would be compensated with extensive woodland planting which would be contiguous with the SSSI, enhancing connectivity with existing habitats and increasing the overall extent of planting. This would ensure overall resilience to habitats in the longer term.

6.5.58 As introduced above, NPSNN paragraph 5.29 identifies that a project may result in adverse effects on SSSIs and consent would not normally be granted unless the '*benefits of the development at this site clearly outweigh both the impacts on the special features of the site and any broader impacts on the national SSSI network'*. The national need for the Project, required to relieve congestion at Dartford and improve resilience within the national road network crossing the River Thames to deliver economic growth, along with the various identified public benefits referred to within Chapter 4 of this Planning Statement and the Need for Development (Application Document 7.1) clearly outweighs the impact of the Project on designated SSSIs. The assessment reported in ES Chapter 8: Terrestrial Biodiversity (Application Document 6.1) confirms that there is no broader impact on the national SSSI network. Therefore, the Project is in accordance with the tests set out in NPSNN paragraph 5.29.

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6.5.59 With regards to Marine Conservation Zones, the Project would accord with the requirements of NPSNN paragraph 5.30 and NPS EN-1 paragraph 5.3.12 which both seek to ensure development proposals would not impact upon the protected features and conservation objectives for the Marine Conservation Zones (MCZ). Section 9.4 of ES Chapter 9: Marine biodiversity, identifies the Swanscombe MCZ as situated approximately 7.5km upstream of the Order Limits, and due to the distance and lack of pathways to impact on MCZ features, it has been agreed with the Marine Management Organisation (MMO) that an MCZ assessment is not required to consent the activities of the Project.

Locally designated sites

6.5.60 Paragraph 5.31 of the NPSNN states that the SoS should give due consideration to regional or local designations, including Local Geological Sites, Local Nature Reserves and Local Nature Improvement Areas as they have a fundamental role to play in meeting overall national biodiversity targets, in contributing to the quality of life and the well-being of the community as well as supporting research and education. However, given the need for new

infrastructure, these designations should not be used in themselves to refuse development consent.

6.5.61 Habitat losses anticipated for locally designated sites over the construction phase are summarised within Tables 8.31 and 8.35 within ES Chapter 8: Terrestrial Biodiversity (Application Document 6.1). Temporary habitat loss is reported in Chapter 8 for the following LWSs:

a. Canal and Grazing Marsh Higham LWS

b. Tilbury Centre LWS

c. Puddle Dock Angling Centre SINC

d. Tilbury Marshes LWS

e. Goshems Farm LWS

f. Linford Pit LWS

g. Ockendon Railsides SINC

h. Thames Chase Forest Centre SINC

i. Fields South of Cranham Marsh SINC

6.5.62 The proposed reinstatement of these habitats (to be secured through the measures within the oLEMP (Application Document 6.7) and REAC (Application Document 6.3) would be expected to re-establish within two to five years following completion of the proposed works.

6.5.63 The following Local Wildlife Sites are predicted to experience significant adverse impacts anticipated over the construction phase in relation to both temporary and permanent habitat losses:

a. Low Street Pit LWS

b. Rainbow Shaw LWS

c. Blackshots Nature Area LWS

d. Codham Hall Wood LWS and ASNW

e. Codham Hall Wood West SINC and ASNW

6.5.64 The Project design has had due regard to these impacts and to compensate for losses, new habitats would be created including woodland planting and the creation of grassland areas. For example, in the case of Blackshots Nature Area LWS impacts would be compensated for through the creation of 40ha of grassland habitat, alongside translocation of species and management plans as outlined in Figure 2.4: Environmental Management Plan (Application Document 6.2) and the Design Principles (Application Document 7.5) Clause numbers PRO.04, PLA.05, LSP.02, LSP.04 and LSP.09. The various mitigation measures proposed across the Project are described in detail in Section 8.5 of ES Chapter 8: Terrestrial Biodiversity (Application Document 6.1).

6.5.65 Wider enhancements are also proposed to enhance the connectivity between sites, and these include a new public recreational site of 35ha at Goshems Farm comprising Open Mosaic Habitats, designed to link existing biodiverse areas to the new Open Mosaic Habitat at Linford (Design Principles Clause LSP.22) and, additionally new areas of wetland, woodland planting and Open Mosaic Habitat are proposed which provide 'stepping stones' between clusters of local wildlife sites and sites of importance for nature conservation along the route of the Project to deliver a landscape scale approach to mitigation.

6.5.66 As a result of the design development which has sought to avoid and mitigate direct impacts upon biodiversity sites (for example though ruling out the undergrounding of overhead lines and careful siting of construction compounds to minimise habitat loss), the impacts identified represent a very modest proportion of the overall number of LWS designations within the zone of influence. Impacts have therefore been minimised as far as practicable. The proposed mitigation measures would ensure the role that these sites play in meeting overall national biodiversity targets (alongside their recreational benefits) would be maintained in the longer term. Furthermore, no likely significant effects are predicted on local wildlife sites during operation.

6.5.67 The NPSNN is clear that given the need for new infrastructure regional and local designations should not be used as a reason to refuse development consent, but that the SoS should give them due consideration. Accordingly, the Project has sought to minimise impacts where possible and provide compensation for losses to seek to retain the function of these sites as far as practicable.

Protected species and habitats of importance

6.5.68 In acknowledging the provisions within NPSNN paragraphs 5.34 to 5.35, habitat surveys have been undertaken to understand the existing ecological conditions. A desk study and ecological surveys have been undertaken to gather baseline information on habitats, protected and notable species in the vicinity of the Project. This includes surveys for marine species, invertebrates, amphibians, reptiles, bats, water voles, otters, dormice, various bird species and badgers. The outcomes of the surveys undertaken are summarised in Section 8.4 of ES Chapter 8: Terrestrial Biodiversity, and Section 9.4 of ES Chapter 9: Marine Biodiversity (Application Document 6.1). Protected species identified within the Order Limits have been taken into account in the assessment of biodiversity effects presented in Section 8.6 of ES Chapter 8: Terrestrial Biodiversity, and Section 9.6 of ES Chapter 9: Marine Biodiversity (Application Document 6.1).

6.5.69 A range of mitigation measures have been included in the Project to reduce adverse impacts on such species. These are set out in Section 8.5 of ES Chapter 8: Terrestrial Biodiversity, and Section 9.5 of ES Chapter 9: Marine Biodiversity (Application Document 6.1).

6.5.70 Paragraphs 2.7.1 and 2.7.2 of NPS EN-5 highlight the specific biodiversity impacts which arise in respect of electricity networks infrastructure in the form of large bird strikes. Steps should be taken to site lines away from, or parallel to, but not across, known flight paths (paragraph 2.7.4) and by making lines as visible as possible (paragraph 2.7.5) and avoiding the creation of perching opportunities (paragraph 2.7.6). Paragraph 2.7.3 of the NPS EN-5 notes that

the decision maker should ensure these matters are addressed in the ES and that appropriate mitigation measures are proposed, where necessary.

6.5.71 ES Chapter 8: Terrestrial Biodiversity (Application Document 6.1) deals with bird strike and overhead lines in paragraphs 8.6.123 and 8.6.352:

6.5.72 'The Project includes the construction of alternative pylon routes to allow for the construction of the Project. One overhead line (OHL) alignment located to the north of the A2 is shifting 90m from the existing alignment. The location of this new alignment is over 2km from the River Thames, where the largest aggregation of birds are to be found. This, in addition to the presence of the existing OHL, would lead to a level of impact that is minor adverse and would result in effects that are considered to be slight adverse and not significant on the general bird assemblage south of the River Thames, which is of county-level importance.'

6.5.73 Taking account of mitigation, the predicted effects of the Project on protected species and habitats of importance are set out in within Section 8.6 of ES Chapter 8: Terrestrial Biodiversity and Section 9.6 of ES Chapter 9: Marine Biodiversity (Application Document 6.1).

6.5.74 Loss of habitat used by terrestrial invertebrates and mortality of terrestrial invertebrate assemblages is identified as a significant impact within the ES. These impacts would be temporary, however, and would persist on a short-term temporary basis (approximately five years) between the time when habitat clearance is undertaken and the establishment of the newly created habitats. Given the disturbed and ephemeral nature of Open Mosaic Habitats, colonisation would be quick and the proposed habitat creation at Coalhouse Fort, Tilbury Fields, Chadwell St Mary, the Mardyke and the M25 would offset for the habitat losses.

6.5.75 In accordance with NPSNN paragraph 5.35, the Applicant has, therefore, taken measures so far as is reasonably practicable to ensure these species and habitat are protected. In respect of any temporary harm, the benefits of the Project set out in the Need for the Project (Application Document 7.1), as well as the specific extent of measures to create new habitats secured through the Environmental Management Plan (Application Document 6.2) and the Design Principles (Application Document 7.5).

6.5.76 Amongst the various other indirect impacts considered, such as noise and visual disturbance during construction (having regard to mitigation) would not give rise to significant impacts upon protected species and other species of importance.

Ancient woodland and veteran trees

6.5.77 Ancient woodland is a valuable biodiversity resource. As stated in paragraph 5.32 of the NPSNN, the SoS should not grant development consent that would result in the loss or deterioration of irreplaceable habitats including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless it can be demonstrated that the national need for and benefits of the development, in that location, clearly outweigh the loss. Where such trees would be affected by development proposals, the applicant should set out proposals for their conservation or, where their loss is unavoidable, the reasons for this.

6.5.78 Impacts upon ancient woodland and veteran trees are described within Section 8.6 of ES Chapter 8, Terrestrial Biodiversity (Application Document 6.1). Significant adverse impacts upon ancient woodland and veteran trees over the construction phase would include direct loss of 7.36ha of ancient woodland, and 10 veteran trees. The ES also identifies significant effects over the operational effects on ASNW due to nitrogen deposition.

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6.5.79 Impacts upon ancient woodland and veteran trees have (amongst various other environmental impacts) been considered throughout the route options selection process, which is described in further detail in Chapter 5 of this document. The policy implications of requiring a loss of ancient woodland were recognised at an early stage (including assessments undertaken in 2013) and this influenced route decisions and subsequent design refinement.

6.5.80 Assessments undertaken in 2016 prior to public consultation, which considered the various route options established that the northern section of Route 3 (the Project route) would not impact any areas of ancient woodland. One of the reasons for discounting Route 4 at this stage included the fact that it would result in the loss of habitat from six areas of ancient woodland some of which occur within Local Wildlife Sites. Another concern related to the fact that Local Wildlife Sites containing ancient woodland may also be affected by changes in air quality (increase in nitrogen) from increased traffic flows.

6.5.81 Further assessments undertaken following public consultation in 2017 which informed the announcement of the Preferred Route Alignment identified that to the south of the Thames, the Eastern Southern Link (ESL) would result in a greater loss of ancient woodland in comparison to the Western Southern Link (WSL) (the selected southern route alignment). Consultation feedback from Natural England at this stage also highlighted that the ESL would be the most environmentally damaging option owing to the loss of SSSI and extensive areas of ancient woodland.

6.5.82 The further refinement of the development design has sought to further mitigate impacts upon ancient woodland as set out in detail within the Project Design Report (Application Document 7.4) along with Chapter 5, Project Evolution and Alternatives, of this Planning Statement. Since PRA in 2017, numerous studies were undertaken to optimize a junction that would accommodate four free-flow links between the Project's route and the A2 at a design speed of 85kph while reducing impacts on ancient woodland. Following Statutory Consultation in 2018 the A2 was moved further south to avoid impacts on ancient woodland to the north. Following Supplementary Consultation in 2020, in considering a range of options for utilities diversions, the Applicant identified the risk of further substantial impacts on areas of Ancient Woodland in Shorne Woods Country Park and Claylane Woods. As a result, two further areas of ancient woodland mitigation were included in the Order Limits.

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6.5.83 Overall, the evolution of the Project design has recognised the potential for impacts from the proposals on ancient woodland and veteran trees. From early in the process, the design development has sought to keep these impacts to a minimum and also to ensure extensive and effective compensation (including 80.75 ha of new planting) would be incorporated within the Order Limits. The landscape scale approach to compensatory woodland planting has sought to buffer retained areas of ancient and SSSI designated woodland as well as

linking together woodland parcels for improved connectivity and habitat reliance for designated sites at a site network level. Given the small proportion of habitat which would be lost, along with the extent of new habitats to be created the overall integrity of the resource would be maintained, and the diversity of species and levels of species populations which these habitats would likely be sustained following their removal. Replacement tree planting is presented within Tables 8.31 and 8.35 of ES Chapter 8: terrestrial Biodiversity and also within the oLEMP (Application Document 6.7). In addition, 0.18ha of new planting is also proposed in respect of veteran trees.

6.5.84 Having regard to the provisions within NPSNN paragraph 5.32, it is concluded that the national need and benefits which would be delivered by the Project (which has sought to minimise impacts and build in biodiversity resilience in the longer term) clearly outweigh the loss of ancient woodland and veteran trees. The Need for the Project (Application Document 7.1) sets out the national need for the Project, which sits within a wider package of works for the strategic road network in the south-east of England which together seek to relief congestion at the Dartford Crossing, to improve the resilience in the national road network across the River Thames to drive economic growth in accordance with the Government's vision and strategic objectives for national networks as identified within the NPSNN. The Project, therefore, accords with NPSNN paragraph 5.32.

Net loss and net gain in biodiversity

6.5.85 The NPSNN states that applicants should avoid significant harm to biodiversity, including through mitigation, and 'as a last resort' compensate for significant harm that cannot be mitigated. The NPSNN (paragraph 5.23) also encourages applicants to show how the Project has taken advantage of opportunities to conserve and enhance biodiversity interests. Paragraph 5.33 of the NPSNN goes on to state that the SoS should consider whether the applicant has 'maximised' opportunities for building in beneficial biodiversity features. These reference conservation of biodiversity more widely and are not limited to the mitigation of significant effects.

6.5.86 The Project has sought to avoid significant harm to features of biodiversity and geological interest, as described within Chapter 5, Project Evolution and Alternatives. This has included a specific consideration of potential biodiversity impacts as one of the criteria in the process. The consideration of alternative routes for the energy NPS elements of the Project has also been a key aspect of the route development and design refinement.

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6.5.87 The location chosen for the Project is at the western extent of the Ramsar site and just west of the western extent of the SPA and has been assessed as having the lowest impact on several environmentally sensitive areas, including the Thames Estuary and Marshes SPA and Ramsar site. The proposal for a bored tunnel as opposed to a bridge design (which was discounted early in the options selection process described in Chapter 5 of this document) would further reduce the potential for direct impacts upon the Thames Estuary and Marshes SPA and Ramsar site.

6.5.88 With regards to utilities, the options considered in relation to the OH7 diversion (including two undergrounding options) are outlined further within Chapter 5,

Project Evolution and Alternatives. Whilst undergrounding the overhead line could significantly reduce the risk of bird strike, this option has been ruled out due to significant and extensive impacts upon both archaeological interests and nature conservation sites. As indicated above, flight paths have also been assessed in detail.

6.5.89 The evolution of the Project design has resulted in the creation of a biodiverse wildlife corridor connecting suitable habitats throughout the wider landscape whilst minimising impacts during construction. The energy NSIP elements of the Project would involve temporary disturbance during construction, but once installed, would remain as open and undeveloped green linear pathways for wildlife at ground level. The various mitigation measures are included within Section 8.5 of ES Chapter 8: Terrestrial Biodiversity, and Section 9.5 of Chapter 9: Marine Biodiversity (Application Document 6.1). The Design Principles (Application Document 7.5) along with the features presented on Figure 2.4: Environmental Management Plan (Application Document 6.2) provide more specific details in relation to embedded mitigation. The measures within the Design Principles document would be legally secured through Requirement 3 of Schedule 2 to the draft DCO (Application Document 3.1). The Register of Environmental Actions and Commitments (REAC) is incorporated within Appendix 2.2: CoCP (Application Document 6.3) and identifies mitigation commitments that underpin the environmental assessments. These commitments would be legally secured through Requirement 4 of Schedule 2 to the draft DCO.

6.5.90 In particular, biodiversity connectivity would be maintained through the introduction of 7 mixed-use green bridges. These bridges have been individually designed to provide the greatest benefit at each particular crossing location (Secured through the Design Principles: Application Document 7.5 and Requirement 3 of the draft DCO (Application Document 3.1)). Planting on green bridges would tie in with the broader landscape to ensure this connectivity. An illustrative image is provided in Appendix B to Design Principles (Application Document 7.5). The new habitat areas proposed to the north of the River Thames have been designed in the form of ‘stepping stone sites’ in order to connect existing biodiverse areas.

6.5.91 Among the various proposed measures for building in beneficial biodiversity (including habitat creation) over the construction phase, mammal passage and ledge provision would be incorporated within proposed culverts (secured through Clauses PRO.04, PLA.05, STR.01 and S9.10 contained within the Design Principles (Application Document 7.5)). In acknowledging the provisions within NPSNN paragraphs 5.34 and 5.35, water vole translocation would take place in areas identified in the water vole licence application (Appendix 8.20: Draft conservation licence for water voles (Application Document 6.3)). Receptor sites would be established through an offsite reintroduction project supported by the Essex Wildlife Trust, reintroducing water voles to catchments within Essex that have suffered from localised extinctions due to the presence of non-native mink (proposed to be eradicated through measures incorporated within the CoCP (Application Document 6.3) and the Consents and Agreements Position Statement (Application Document 3.3)).

6.5.92 National Highways has committed to achieving no net loss in biodiversity by the end of RIS 2 and will work towards biodiversity net gain by 2040 (Highways

England, 2018a) across its estate. The Applicant has sought to increase biodiversity value wherever possible within its ecological mitigation and compensation planting and wider landscape design. Appendix 8.21: Biodiversity Metric Calculations (Application Document 6.3) to ES Chapter 8: Terrestrial Biodiversity, presents the results of a biodiversity metric assessment.

Table 6.4 Summary of Biodiversity metric results

Assessment	Biodiversity unit type	Change in biodiversity units (%)
LTC Project (overall)	Area-based	7%
	Hedgerows	-11%
	Rivers and streams	-7%
LTC Project North	Area-based	9%
	Hedgerows	-18%
	Rivers and streams	-7%
LTC Project South	Area-based	3%
	Hedgerows	24%
	Rivers and streams	-8%

ES Appendix 8.21 Table 1.1 Summary of Metric results

6.5.93 The Project has, in accordance with paragraphs 5.23, 5.25, 5.26 and 5.33 of the NPSNN, therefore, sought to avoid impact on designated sites through the option assessment process, where impacts are unavoidable, there is an overriding need for the Project that clearly outweighs the impact of the Project. In addition, the Project provides biodiversity mitigation and enhancement measures to secure no net loss of biodiversity across the Project.

Waste management

6.5.94 Paragraph 5.39 of the NPSNN states that the aim of Government policy on hazardous and non-hazardous waste is to '*protect human health and the environment by producing less waste and by using it as a resource wherever possible'* in accordance with the 'waste hierarchy' (paragraph 5.40). These sentiments are replicated at paragraphs 5.14.1 and 5.14.2 of NPS EN-1 (and in so far as it is relevant, paragraphs 5.15.1 and 5.15.2 of the draft NPS EN-1). Paragraph 5.42 of the NPSNN further sets out arrangements which should be secured to ensure appropriate management.

6.5.95 In accordance with those paragraphs, the Project includes a number of REAC measures, including a requirement to prepare Site Waste Management Plans. The DCO application includes an outline Site Waste Management Plan (Application Document 6.3). Section 11.5 of ES Chapter 11: Material Assets and Waste (Application Document 6.1) and Appendix 11.1: Excavated Materials Assessment (Application Document 6.3), outline how the proposed arrangements have sought to minimise the both the volume of waste produced and the volume sent for disposal.

6.5.96 Paragraph 11.6.27 of ES Chapter 11: Material Assets and Waste (Application Document 6.1) describes how the Project would generate approximately 12.5 million m^3 (cubic metres) of excavated materials. An estimated 11.5 million m^3 of that would be suitable for reuse either on or off the site. Of that, the Applicant would seek to reuse an estimated 11.18 million m^3 within the Project design (paragraph 11.6.27 of ES Chapter 11).

6.5.97 Paragraph 5.43 of the NPSNN sets out that the SoS should be satisfied that waste can be dealt with '*appropriately by the waste infrastructure which is, or is likely to be, available*'. In accordance with this, ES Chapter 11: Materials and Waste (Application Document 6.1) shows that waste from the Project can be dealt with appropriately by the waste infrastructure, which is, or is likely to be, available.

6.5.98 Appendix 11.1: Excavated Materials Assessment to ES Chapter 11: Material Assets and Waste (Application Document 6.3) demonstrates that there is sufficient capacity at suitable potential sites to manage excavated materials. It also provides a mechanism for assessing any additional suitable potential sites for the treatment, handling or use of excavated material.

6.5.99 5.5.106 Paragraph 5.43 of the NPSNN also sets out that waste arisings should not have an adverse effect on the capacity of existing waste management facilities to deal with other waste arisings in the area. Paragraph 11.6.44 of ES Chapter 11: Material Assets and Waste (Application Document 6.1) notes that the Project would use less than 1% of the inert and non-hazardous landfill capacity in England, which would be below the threshold to trigger a significant effect. However, the Project would use more than 1% of inert and non-hazardous landfill capacity in the study area. This is above the threshold outlined within DMRB LA 110 Material assets and waste (Highways England, 2019), and is judged to be moderate adverse effect and therefore significant.

6.5.100 However, this assessment of significance uses the criteria set out within DMRB LA 110 (Highways England, 2019), which only reports against landfill capacity, not reuse, recycling or recovery within the study area. With regard to paragraph 5.43 of the NPSNN, the assessment demonstrates that an adverse effect on the capacity of existing waste management facilities, as a whole, to deal with other waste arisings in the area would not occur. The Project would use approximately 2.59% of inert and non-hazardous landfill capacity within the study area, which includes a landfill site located within the Order Limits. If this site was excluded from the assessment, the Project would use approximately 0.94% of inert and non-hazardous landfill capacity within the study area, which would be less than the 1% threshold required to trigger a significant effect. In addition, the Project would use only 0.5% of the annual recycling/treatment and/recovery capacity in the study area (paragraph 11.6.38 of Chapter 11).

6.5.101 The Excavated Materials Assessment (ES Appendix 11.1, Application Document 6.3) demonstrates that there is sufficient capacity at suitable potential receptor sites to manage excavated materials. In addition to reducing waste through design, the Project design has sought to reuse as much excavated material on site as feasible, using a range of measures identified in Section 11.5 of ES Chapter 11: Materials Assets and Waste (Application Document 6.1). The Project therefore accords with paragraph 5.43.

6.5.102 Paragraph 4.1.3 of the Excavated Materials Assessment (ES Appendix 11.1, Application Document 6.3) demonstrates that approximately 5.9 million m^3 of capacity for reuse/recovery operations potentially exists within 20km of the Project to the north of the River Thames, and approximately 4.4 million m^3 to the south of the River Thames. A total potential capacity of 10.3 million m^3 of capacity exists in the vicinity of the Project. Paragraph 4.1.3 of the Excavated Materials Assessment (ES Appendix 11.1, Application Document 6.3) states that given the anticipated surplus excavated material volume from the north of the River Thames requiring recovery offsite is approximately 350,000 m^3, sufficient capacity is present in the local area to receive the material.

Minerals Safeguarding

6.5.103 Paragraph 5.182 of the NPSNN also sets out a requirement for safeguarding any mineral resources and the incorporation of appropriate mitigation measures to safeguard mineral resources.

6.5.104 Appendix 11.2: Minerals Safeguarding Assessment of ES Chapter 11: Material Assets and Waste (Application Document 6.3) reports that there would be safeguarded land sterilised by the Project (Table 6.1). These findings have been discussed and agreed with the relevant minerals planning authorities (paragraph 1.1.7 and Table 3.4).

6.5.105 Paragraph 1.1.11 of Appendix 11.2, however, notes that, where avoidance of safeguarded mineral units has not been possible and in line with Paragraph 5.182 of the NPSNN, the Applicant has sought to identify appropriate mitigation measures. These measures prioritise the prior extraction and reuse, recycling and recovery of materials excavated as part of the construction works within the Project design.

6.5.106 In view of the above the Project is considered to accord with the relevant provisions of the NPSNN in so far as its requirements for waste management are concerned.

Civil and military aviation and defence interests

6.5.107 Paragraph 5.55 and 5.56 of the NPSNN requires the Applicant to consult with a number of statutory stakeholders with interests in civil and military aviation and defence interests to ensure that the Project has no impact. The same requirement is set out at paragraph 5.4.10 of both NPS EN-1 and paragraph 5.5.10 of the draft NPS EN-1.

6.5.108 The Ministry of Defence (MoD) and National Air Traffic Service (NATS) have confirmed as part of the Scoping Opinion for the Project, that there is no conflict with their safeguarding criteria.

Coastal change

6.5.109 The NPSNN, at paragraph 5.67 and the NPS EN-1 at paragraph 5.5.3 set out provisions relating to coastal change. Table 1.2 in ES Appendix 9.2 (Application Document 6.3), states that the Project team has undertaken a programme of engagement with the MMO and also with the EA, the latter considering all aspects of coastal protection in terms of proposed construction and operational activities. Due to the small-scale nature of the works in relation to the marine environment, the EA has agreed that the Project would not influence coastal

protection. As the Project is not within a Coastal Change Management Area (CCMA), and it does not involve any dredging and that the Project would not influence coastal protection, paragraphs 5.71, 5.75, 5.76 and 5.80 of the NPSNN are not considered relevant.

Dust, odour, artificial light, smoke, steam

6.5.110 To conform with the provisions within NPSNN paragraphs 5.82 – 5.89 an assessment has been undertaken of the likely significant effects on amenity and biodiversity from emissions of dust and artificial light as reported in ES Chapter 5: Air Quality, Chapter 6: Cultural Heritage, Chapter 7: Landscape and Visual, and Chapter 8: Terrestrial Biodiversity (all Application Document 6.1). The Habitats Regulations Assessment Report: Screening Report and Statement to Inform an Appropriate Assessment (Application Document 6.5) considers the impacts of both lighting and dust on European Sites. No harmful impacts from dust are predicted over the operational phase.

6.5.111 The Register of Environmental Actions and Commitments (REAC) ((Application Document 6.3, Appendix 2.2) sets out the procedures to be followed to ensure that impacts from these emissions, that have been assessed in the ES, are reduced as far as reasonably practicable, to minimise impacts on local communities and other potential receptors during the construction phase (as required by NPSNN paragraph 5.83). Operational phase measures to reduce the impacts assessed within the ES are set out within the Design Principles Document (Application Document 7.5). This approach also accords with NPSNN paragraphs 5.83 and 5.87 which together acknowledge that some impact on amenity, landscape and biodiversity is likely when considering NSIPs, but require that such impacts should be minimised to ensure they would not be unacceptable.

6.5.112 Table 5.1 within ES Chapter 5, Table 8.1 within ES Chapter 8, and Table 7.2 within ES Chapter 7 together summarise the stakeholder consultation which has been undertaken in relation to dust and (in the case of the latter) light impacts.

6.5.113 Paragraphs 5.6.1 and 4.6.2 of NPS EN-1 (and the draft NPS EN-1) include insect infestation within the list of potential impacts under Section 6.6. Whilst insect infestation may well cause issues in respect of energy projects related to the reuse of waste, it has not been identified as a relevant issue in the relocation of gas pipelines or overhead lines associated with this Project.

6.5.114 With regards to the requirements set out within NPSNN paragraph 5.88 in relation to defence of statutory authority against nuisance claims, the Statement of Statutory Nuisance (Application Document 6.6) concludes that the Project does have the potential to engage five of the statutory nuisances listed in the Environmental Protection Act (EPA) 1990. Those which are of relevance to dust and light are as follows:

a. ‘any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance;’

b. ‘any accumulation or deposit which is prejudicial to health or a nuisance;’

c. ‘artificial light emitted from premises so as to be prejudicial to health or a nuisance;’

6.5.115 However, with the appropriate mitigation measures in place, none of the statutory nuisances identified in section 79(1) of the EPA 1990 are predicted to arise during the construction or operation of the Project.

6.5.116 In acknowledging the provisions within NPSNN paragraph 5.89 construction will be planned to minimise the impact on local communities arising from dust and artificial light. Construction phase good practice measures for dust are outlined in the REAC (Application Document 6.3, Appendix 2.2). These mitigation measures are secured in the CoCP (Application Document 6.3, Appendix 2.2).

6.5.117 Having regard to these measures, paragraph 5.6.6 of ES Chapter 5: Air Quality (Application Document 6.1) concludes that given that individual plant would operate for relatively short periods of time in any given area and considering the low background pollutant concentrations, construction dust emissions are unlikely to trigger exceedances of AQS objectives and a significant air quality effect. Because no adverse impacts arising from dust emissions have been identified by the ES in relation to the operation of the Project no mitigation is needed in respect of this.

6.5.118 During construction, artificial lighting would be required at construction compounds, the locations of which are shown on ES Figure 2.2: Construction Compounds (Application Document 6.2). There would also be lighting from construction vehicle headlights, construction staff accommodation and site offices, on haul routes and other general working areas. Section 6.8 of the CoCP (Application Document 6.3, Appendix 2.2) would ensure any temporary lighting would not give rise to an unacceptably harmful impact upon local amenity. REAC reference TB024 aims to reduce the impact of construction lighting on sensitive ecological receptors. These measures will be legally secured through DCO Requirement 4.

6.5.119 Paragraphs 6.2.35 to 6.2.37 and 6.2.107 to 6.2.115 of the Habitats Regulations Assessment Report: Screening Report and Statement to Inform an Appropriate Assessment (Application Document 6.5) establishes that functionally linked land associated with European sites adjacent to the A226 Gravesend Road compound, Milton compound and northern tunnel entrance compound would not be affected by lighting to the extent that significant effects are likely, having regard to the mitigation measures referred to above. For all the compounds, the 0.5 lux contour is within the Order Limits and therefore no light spill would be perceivable within the Thames Estuary and Marshes Ramsar site. The report also concludes that the existence of lighting associated with the various ports and other developments, which result in a significant night time glow along this part of the River Thames also means any construction and operational lighting for this Project would not materially change overall light levels. Therefore, the Project lighting would not be expected to result in any disturbance to birds feeding and roosting within the functionally linked land.

6.5.120 Section 7.6 of ES Chapter 7: Landscape and Visual (Application Document 6.1) assess the impacts of artificial lighting during the operational phase of the Project, the Project Design Principles (Application Document 7.5) Section 4.6 sets out the operation principles guiding lighting.

6.5.121 The project wide operational lighting design as described in ES Chapter 2 Project Description (Application Document 6.1) includes measures that would reduce the effect of light spill on surrounding habitats.

6.5.122 Design Principles Clauses LST.02 and LST.03 within the Design Principles, (Application Document 7.5) require that 'To preserve the rural and historic nocturnal character of the landscape along the Project route (including the A2/M2 Corridor) and to maintain dark corridors for wildlife, lighting will be minimised wherever it is reasonably practicable and safe to do so, but shall remain in accordance with relevant standards' and that 'Lighting required at 'off-line' operational areas (such as at the portals) shall be controllable, directional and as low-level as is practicable.' These measures would be legally secured through Requirement 3 of the draft DCO (Application Document 3.1).

6.5.123 In conclusion, it is considered that the SoS can be satisfied that all reasonable steps have been or would be taken to minimise detrimental impacts arising from dust and artificial light where they arise. The Project therefore complies with the NPSNN in this regard. In respect of the Energy NSIP aspects of the Project, no adverse impacts are envisaged in respect of insect infestation.

Flood risk

Development on areas subject to flood risk

6.5.124 Paragraph 5.91 of the NPSNN refers to paragraphs 100 to 104 of the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021) which make it clear that inappropriate development should be avoided in areas at risk from flooding by directing development away from areas at highest risk. These matters are now addressed in paragraphs 159 to 167 of the current (2021) version of the NPPF.

6.5.125 In accordance with policy set in paragraph 5.91 of the NPSNN, to ensure areas at risk of flooding are avoided, the majority of the Order Limits falls within Flood Zone 1, the lowest level of flood risk. Only small parts of the Project cross Flood Zones 2 and 3.

6.5.126 Paragraph 5.91 of the NPSNN also refers to the NPPG on flood risk which supports the policy in the NPPF. Table 2 of the NPPG ('Flood risk vulnerability and flood zone compatibility') identifies that essential transport infrastructure is a category of development which is appropriate in Flood Zones 1 and 2. Furthermore, essential infrastructure can be appropriate in Flood Zone 3 provided the requirements of the Exception test are passed (Paragraph 5.91 of the NPSNN). Annex 3 to the NPPF sets out a flood risk vulnerability classification which includes in the definition of 'essential infrastructure', 'essential transport infrastructure which has to cross the risk area' which would apply to the Project.

Flood Risk Assessment

6.5.127 Paragraph 5.92 and 5.93 of the NPSNN (and paragraph 5.7.4 of the NPS EN-1) requires applications for almost all projects to be accompanied by a Flood Risk Assessment (FRA) setting out the nature and extent of any flood risk and how these will be managed, taking climate change into account. In accordance with

those paragraphs, an FRA has been produced and is presented in ES Appendix 14.6 (Application Document 6.3).

6.5.128 Paragraph 5.94 of the NPSNN requires that the FRA should provide the evidence to allow the SoS to apply the Sequential Test (paragraph 105 of the NPPF) and Exception Test (paragraph 106 of the NPPF) as appropriate. Section 3.4 (Table 3.4 of Part 6 of the FRA (Appendix 14.6 to ES Chapter 14: Road Drainage and the Water Environment (Application Document 6.3) demonstrates that the Sequential Test is passed and provides the rationale and justification for parts of the Project being located in Flood Zone 3 and, so accordance with paragraphs 5.105 and 5.106 of the NPSNN. Section 3.5 of the FRA provides the narrative in respect of the Exception Test (where this is relevant) and Text Box 3.1 notes that, as the Project is considered to provide wider sustainability benefits that outweigh flood risk and would be safe for its lifetime without increasing flood risk elsewhere, it is deemed to satisfy the requirements of the Exception Test.

6.5.129 Paragraph 5.94 of the NPSNN (and paragraph 5.7.2 of the NPS EN-1 and paragraph 5.8.5 of the draft NPS EN-1) requires that FRAs should take the impacts of climate change into account. The FRA incorporates climate change projections as detailed in Section 4 of Part 6 (of ES Appendix 14.6: FRA Application Document 6.3) in terms of peak rainfall intensity, peak river flow and sea level rise.

6.5.130 In accordance with paragraph 5.96 of the NPSNN, the FRA should be subject to early pre-application discussions with the Environment Agency (EA) and other relevant flood risk management bodies. Part 1 of the FRA (ES Appendix 14.6, Application Document 6.3) details the stakeholders involved in its preparation (paragraph 5.1.1). These include extensive engagement with the Environment Agency and other relevant flood risk management bodies.

6.5.131 Paragraph 5.99 of the NPSNN requires the SoS, when determining an application to ensure that it will not result in increased flooding elsewhere and that the development itself is appropriately flood resilient and resistant.

6.5.132 The FRA has considered all sources of flood risk. The drainage design for the Project would reduce the risk of causing flooding elsewhere by using attenuation features as shown in ES Figure 2.4: Environmental Management Plan (Application Document 6.2). Appropriate working arrangements would be in place to ensure satisfactory emergency responses to flood risk (amongst other things) which are secured through the CoCP (Application Document 6.3, Appendix 2.2,), Section 6.12 which deals with Emergency preparedness).

Mitigation and minimisation of flood risk

6.5.133 In accordance with paragraph 5.100, the proposed operational drainage systems have been designed in accordance with relevant national standards. In addition, the REAC ensures appropriate maintenance measures are secured in connection with them (see, for example, REAC measures RDWE002 to RDWE012). Flood resilience measures are addressed through REAC commitment RDWE029: Flood Protection.

6.5.134 Paragraphs 5.102 to 5.104 of the NPSNN set out what steps and measures the SoS might expect an Applicant to take to minimise and mitigate risk in a flood risk area.

6.5.135 The Project represents the most viable route which unavoidably crosses areas at high risk of flooding. However, the sections of the route alignment that lie in Flood Zone 3 are confined to areas that benefit from existing flood defences. The steps which have been taken to avoid, limit and reduce flood risk are presented in ES Appendix 14.6: FRA (Application Document 6.3). This includes a sustainable highway drainage design providing for runoff treatment and attenuation, compensation floodplain storage and measures to reduce groundwater ingress into excavations.

6.5.136 The mitigation incorporated within the Project design is set out in Section 14.5 of ES Chapter 14: Road Drainage and the Water Environment (Application Document 6.1). The proposed drainage measures for the Project are designed to manage surface runoff and include attenuation features to detain runoff. The Project has, therefore, been designed with appropriate mitigation in place to ensure that during a flood event the route alignment should always remain operational. For example, in recognising the potential for proposed embankments within the Project design, including those between viaducts over the Mardyke floodplain area to reduce available storage for floodwaters and alter floodplain flow paths, a suite of flood alleviation measures incorporated within the Project design would prevent increases in flood risk elsewhere.

6.5.137 Alongside the above measures, paragraph 5.110 of the NPSNN identifies that the use of Sustainable Drainage Systems (SuDS) and planting of vegetation are also considered to be appropriate forms of mitigation as these measures can slow runoff and so mitigate flood risk. A strategy for managing operational surface water drainage has been prepared centred on the application of SuDS, appropriate to local conditions. The strategy is summarised in Part 7 of ES Appendix 14.6: FRA (Application Document 6.3). The drainage principles have been discussed and agreed with the relevant Lead Local Flood Authorities (LLFAs), as detailed in ES Chapter 14: Road Drainage and the Water Environment (Application Document 6.1).

6.5.138 In accordance with paragraphs 5.112 to 5.115 of the NPSNN, the drainage systems for Project have been designed to minimise the risk of flooding elsewhere by incorporating current design standards and future climate change allowances. A strategy for managing operational surface water drainage has been prepared centred on the application of SuDS, appropriate to local conditions. The strategy is summarised in Part 7 of ES Appendix 14.6: FRA (Application Document 6.3). The drainage principles have been discussed and agreed with the relevant LLFAs, as detailed in ES Chapter 14: Road Drainage and the Water Environment (Application Document 6.1). Outfalls to watercourses include retention ponds to reduce outflows to greenfield runoff rates. Retention ponds would include vegetation and sediment forebays or vortex grit separators to provide water quality treatment. All outfalls would include facilities to staunch and contain any accidental spillages.

6.5.139 Opportunities to provide flood mitigation areas with multiple benefits have been primarily focused around biodiversity enhancements. Across the Project, freshwater and wetland habitat would be created to compensate for reaches of open watercourse channels lost to culverting or infilling beneath the Project footprint.

6.5.140 On this basis of this evidence and approach, the Applicant has demonstrated accordance with policy in the following ways:

a. Flood risk has been appropriately assessed against the relevant guidance with input from all relevant stakeholders

b. Where appropriate, the Sequential and Exception Tests have been passed, so justifying parts of the Project being located in higher flood risk zones

c. Where risk impacts have been identified, appropriate mitigation measures are either incorporated within the design of the Project or otherwise proposed to ensure to address this risk and ensure that the Project would be delivered in a safe and sustainable manner in accordance with the requirements of the NPSNN and NPS EN-1 (and, in so far as it is relevant to this Project, the draft NPS EN-1).

Land instability (geology and soils)

6.5.141 Paragraph 5.117 of the NPSNN requires that proposals should be appropriate for their location including in terms of preventing unacceptable risks from land instability. Where land stability could be an issue the approach to its assessment should take into account the requirements of the NPPF and supporting guidance.

6.5.142 The relevant paragraphs of the NPPF seek to:

a. Prevent new or existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability (NPPF paragraph 174(e));

b. Ensure that sites are suitable for their proposed use taking account of ground conditions and any risks arising from land instability and contamination (NPPF paragraph 183(a)); and

c. Ensure that, where sites are affected by contamination or land instability issues, responsibility for securing a safe development, rests with the developer and/or landowner (NPPF paragraph 184).

6.5.143 To demonstrate accordance with paragraphs 5.117 and 5.118 of the NPSNN, the Project design has been informed by a preliminary assessment of potential ground instability (DMRB CD 622: Managing Geotechnical Risk (Highways England, 2020)) which was undertaken at the early design stage and is presented in ES Appendix 10.2: Stability Report (Application Document 6.3). The report identifies the geology and ground conditions within the study area that may pose a risk to the Project as well as the potential for unacceptable risks from land instability in surrounding areas that may be caused by Project features such as earthworks and the tunnel. The conclusions of the land stability assessment confirm that there are no significant risks identified within the study area as defined in ES Chapter 10: Geology and Soils (Application Document 6.1).

6.5.144 The assessment has also determined control measures to demonstrate technical feasibility of the Project. Feasible engineering solutions have been incorporated into the design of the Project to manage and mitigate any risk. For

example, through the routine design and engineering of earthworks, the design of slopes to a stable angle, providing physical support or stabilisation of the slope, and drainage measures to reduce groundwater pressures on the slope and tunnel-boring practices (ES Appendix 10.2, Application Document 6.3).

6.5.145 Management of geotechnical risk is an ongoing process and the Project would continue to adopt DMRB CD 622 through the detailed design and construction phase. This is set out in the REAC and secured through Requirement 4 of the draft DCO (Application Document 3.1). Where lower-level risk cannot be ruled out, paragraph 5.119 of the NPSNN sets out a range of options open to Applicants to mitigate and minimise the risk of land instability.

Contaminated land

6.5.146 ES Appendix 10.6 (Application Document 6.3) presents a desktop study of current and historic land uses and identifies over 200 features as credible sources of contamination (primarily former landfill / waste sites, industrial and commercial and petrol station uses). Following the ground investigations and subsequent assessments (Application Document 6.3, Appendix 10.9 Annex A-D), the number of potential contaminant sources and the risk they present has been refined, with only 16 residual credible contaminant sources with a medium or high-risk rating. These are noted as requiring further management, remediation, and specific detailed design which is addressed by Appendix 10.11: Remediation Options Appraisal and Outline Remediation Strategy and specifically the inclusion of REAC commitments GS001 and GS027 secured through Schedule 2 Requirement 4 of the draft DCO, in accordance with paragraph 5.119 of the NPSNN.

6.5.147 These measures are supplemented by Contractors' adoption of good practice construction techniques (summarised in ES Chapter 10: Geology and Soils (Application Document 6.1)) as secured through the REAC which forms Section 7 of the CoCP (Application Document 6.3, Appendix 2.2).

6.5.148 Feasible engineering solutions have also been incorporated into the design of the Project to manage and mitigate any contamination risk (Appendix 10.11 Remedial Options Appraisal and Outline Remediation Strategy (Application Document 6.3).

6.5.149 The overarching conclusion of the assessments in ES Chapter 10: Geology and Soils (Application Document 6.1) and summarised in Table 10.24, is that there are no significant risks identified within the study area in respect of land contamination.

Summary

6.5.150 The detailed assessment carried out and reported in ES Chapter 10: Geology and Soils (Application Document 6.1) along with the control measures identified the REAC/CoCP (Application Document 6.3, Appendix 2.2) and secured through Schedule 2, Part 1 of the draft DCO demonstrate that the Project has complied with the policy requirements and accordingly, it is considered that the SoS can be satisfied that the Project accords with the relevant requirements of the NPSNN. Accordance against the NPSNN requirements for soil resources and best and most versatile land are described in the land use section of this chapter.

Historic environment

Introduction

6.5.151 The NPSNN and NPS EN-1, EN-4 and EN-5 recognise that the construction and operation of national networks infrastructure and energy infrastructure respectively has the potential to result in adverse impacts on the historic environment.

6.5.152 In accordance with paragraphs 5.126 to 5.127 of the NPSNN and paragraphs 5.8.8 to 5.8.10 of the NPS EN-1 (and paragraphs 5.9.10 to 5.9.15 of the draft NPS EN-1), ES Chapter 6: Cultural Heritage (Application Document 6.1) sets out the effects of the Project during the construction and operation on cultural heritage and provides the information required by paragraphs 5.128 and 5.129 of the NPSNN. This section of the Planning Statement summarises these findings before addressing the decision-making policies (and other policies in the NPSs where relevant) having regard to the assessment of effects in the ES.

Residual effects on heritage assets

6.5.153 A full list of heritage assets recorded in the study area, including those recorded during archaeological geophysical survey and archaeological trial trenching, at a project wide level, can be found in the following Appendices to Chapter 6 (Cultural Heritage): ES Appendix 6.1 Desk based assessment, ES Appendix 6.2 Aerial mapping study, Appendix 6.3 - 20th Century Military Archaeological Report, Appendix 6.4 - Coastal Forts Statements of Significance, ES Appendix 6.7 Geophysical Survey reports, ES Appendix 6.8 Trial Trenching Reports, ES Appendix 6.10 Assessment Tables, Appendix 6.11 and 6.12 Archaeological Trial Trenching WSI South and North and ES Appendix 6.15 Gazetteer and Schedule of Heritage Assets (Application Document 6.3).

6.5.154 The assessment of effects on heritage assets has been undertaken in accordance with DMRB LA 104 Environmental Impact Assessment and Monitoring (Highways England, 2020) and DMRB LA 106 Cultural Heritage Assessment (Highways England, 2020) as well as best practice advice produced by Historic England and the Chartered Institute for Archaeologists (in accordance with NPSNN paragraph 5.128 and paragraph 5.8.11 of the NPS EN-1 and 5.9.17 of the draft NPS EN-1).

6.5.155 In accordance with paragraphs 5.129 and 5.130 of the NPSNN, Section 6.5 of ES Chapter 6: Cultural Heritage (Application Document 6.1) outlines how the engineering and landscape design for the Project seeks to avoid or reduce adverse impacts on designated and non-designated heritage assets as a result of change within their setting that would negatively affect their significance, including:

a. for the archaeological heritage assets, embedded mitigation through design would reduce adverse impacts through proposed earthworks and planting as shown within ES Figure 2.4: Environmental Management Plan (Application Document 6.2).

b. the ES describes the embedded mitigation during the construction and operational phases. Embedded mitigation has been developed throughout

the construction design process including review of construction compound locations and proposed construction routes to avoid archaeological sites.

c. embedded mitigation for the operational phase has involved the main alignment avoiding, where possible, designated heritage assets such as scheduled monuments, listed buildings and conservation areas. Where this has not been possible, efforts have been made to minimise the physical impacts on these assets as much as possible and remaining impacts have been accounted for in the assessment.

d. other embedded mitigation during the operation phase relate to the mitigation of permanent visual or noise impacts which affect the setting of designated and non-designated heritage assets.

e. In accordance with NPSNN paragraph 5.130; Project-wide Design Principles are detailed in the ES and Application Document 7.5 and provide additional details with regards to embedded design.

6.5.156 In accordance with NPSNN paragraphs 5.139 and 5.140; in line with Requirement 9 of the draft DCO (Application Document 3.1), a Site-Specific Written Scheme of Investigation (WSI) for areas of archaeological interest will be prepared that outlines specific measures that would apply to particular pieces of archaeological fieldwork, to be carried out as part of the programme of archaeological mitigation works in accordance with the principles of the AMS-OWSI.

6.5.157 With reference to paragraph 5.139 of the NPSNN (which notes that 'a documentary record of our past is not as valuable as retaining the heritage asset and therefore the ability to record evidence of the asset should not be a factor in deciding whether consent should be given'), the effect of paragraphs 5.139 and 199 is not that the recording of evidence may not be taken into account by the SoS. The recording should be considered alongside all other factors in assessing the planning balance applying to the Project, including the environmental, and economic benefits that it delivers (in accordance with City of York Council v English Heritage Trust Limited [2017] EWHC 1374 which held that the equivalent provisions in the NPPF should be read as meaning recording 'should not be a decisive factor').

6.5.158 ES Chapter 6: Cultural Heritage (Application Document 6.1) provides details of recording heritage assets and states in paragraph 6.6.5 that:

> 'Where appropriate the effects are presented in this chapter following archaeological recording. All heritage assets hold information about the past and archaeological investigation and recording is the only method of releasing that information. Without archaeological investigation and recording the assets and its ability to tell us about the past is totally lost, with recording the physical asset is lost but the information is retained and will form part of our collective heritage that can be studied and enjoyed in the future. Archaeological excavation, recording the results and using them to "advance understanding of the significance of the heritage asset before it is lost (wholly or in part)" (NN-NPS para 5.140), will reduce the magnitude of impact on all non-designated heritage

assets by one level of magnitude. Thus without recording a moderate adverse effect would be a major adverse effect.'

6.5.159 Recording is also considered in NPSNN paragraph 5.140 which states that:

> 'Where the loss of the whole or part of a heritage asset's significance is justified, the Secretary of State should require the applicant to record and advance understanding of the significance of the heritage asset before it is lost (wholly or in part). The extent of the requirement should be proportionate to the importance and the impact. Applicants should be required to deposit copies of the reports with the relevant Historic Environment Record. They should also be required to deposit the archive generated in a local museum or other public depository willing to receive it.'

6.5.160 In accordance with that paragraph, EA Appendix 6.9 Outline Archaeological Mitigation Strategy (Application Document 6.3) provides a Draft Archaeological Mitigation Strategy and Outline Written Scheme of Investigation (dAMS-OWSI). It details the recording of heritage assets that are to be lost as a result of the Project. Mitigation through archaeological excavation and recording (REAC Ref. CH001, AMS-OWSI No.2-5) would take place in accordance with NPSNN paragraph 5.140.

6.5.161 Tables 6.9 to 6.11 of ES Chapter 6: Cultural Heritage (Application Document 6.1) provide a summary of impacts and resulting significance of effect. These tables take into consideration the mitigation measures as outlined above and in more detail in ES Chapter 6.

6.5.162 The following subsections deal with NPS policy in relation to non-designated heritage assets and then designated heritage assets including an assessment of the level of harm and the relevant policy tests relating to 'substantial harm' and 'less than substantial harm' to designated assets.

Non-designated heritage assets

6.5.163 The Applicant has taken account of paragraphs 5.128-5.130 of the NPSNN in the assessment of the impact of the Project on any heritage asset with accordance demonstrated in Appendix A of this Planning Statement.

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6.5.164 Paragraph 5.124 of the NPSNN requires that non-designated heritage assets of archaeological interest that are demonstrably of equivalent value to scheduled monuments should be considered subject to the policies relevant to designated heritage assets. Paragraph 6.3.57 of ES Chapter 6: Cultural Heritage (Application Document 6.1) states that '*For non-designated heritage assets (buildings, archaeology and historic landscapes), value has been assigned using a combination of Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (Historic England, 2008); GPA 3 (Historic England, 2017b) and professional judgement.*'

6.5.165 Paragraph 6.3.78 of ES Chapter 6: Cultural Heritage (Application Document 6.1) confirms that none of the non-designated heritage assets of archaeological interest are considered to have the equivalent significance to a scheduled monument.

6.5.166 Paragraph 5.125 of the NPSNN requires other non-designated heritage assets to be taken into consideration, where there is clear evidence that the assets have a significance that merits further consideration, even though they are of lesser value than designated heritage assets. ES Chapter 6: Cultural Heritage (Application Document 6.1) provides an assessment of the significance of other non-designated heritage assets.

Designated heritage assets

Substantial harm

6.5.167 Paragraph 5.131 of the NPSNN states that:

> 'When considering the impact of a proposed development on the significance of a designated heritage asset, the Secretary of State should give great weight to the asset's conservation. The more important the asset, the greater the weight should be. Once lost, heritage assets cannot be replaced and their loss has a cultural, environmental, economic and social impact. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting. Given that heritage assets are irreplaceable, harm or loss affecting any designated heritage asset should require clear and convincing justification. Substantial harm to or loss of a grade II Listed Building or a grade II Registered Park or Garden should be exceptional. Substantial harm to or loss of designated assets of the highest significance, including World Heritage Sites, Scheduled Monuments, grade I and II* Listed Buildings, Registered Battlefields, and grade I and II* Registered Parks and Gardens should be wholly exceptional.'

6.5.168 This is supported by Paragraphs 5.132 and 5.133 of the NPSNN which state:

> 'Any harmful impact on the significance of a designated heritage asset should be weighed against the public benefit of development, recognising that the greater the harm to the significance of the heritage asset, the greater the justification that will be needed for any loss.'
>
> 'Where the proposed development will lead to substantial harm to or total loss of significance of a designated heritage asset, the Secretary of State should refuse consent unless it can be demonstrated that the substantial harm or loss of significance is necessary in order to deliver substantial public benefits that outweigh that loss or harm, or alternatively that all of the following apply:
>
> a. the nature of the heritage asset prevents all reasonable uses of the site; and
>
> b. no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and
>
> c. conservation by grant-funding or some form of charitable or public ownership is demonstrably not possible; and

d. the harm or loss is outweighed by the benefit of bringing the site back into use.'

6.5.169 In the A428 Black Caxton to Gibbet decision letter, the SoS confirmed their approach to applying these tests as follows:

a. The first step is whether the substantial harm or loss of significance is necessary in order to deliver substantial public benefits. In applying this test, the SoS considers it necessary to evaluate whether there are any other solutions which could have avoided the substantial harm and loss of significance, and if so whether these solutions would amount to a reasonable means of achieving the public benefits.

b. The second step is then for the SoS to consider whether the substantial benefits outweigh the harm.

6.5.170 In planning terms, there is no definition of 'substantial' harm. However, Bramshill v SSHCLG [2021] EWCA Civ 320 states that 'What amounts to "substantial harm" or "less than substantial harm" in a particular case will always depend on the circumstances. Whether there will be such "harm", and, if so, whether it will be "substantial", are matters of fact and planning judgment. The NPPF does not direct the decision-maker to adopt any specific approach to identifying "harm" or gauging its extent'.

6.5.171 The Planning Practice Guidance (PPG) details in paragraph 018 that 'Whether a proposal causes substantial harm will be a judgement for the decision maker, having regard to the circumstances of the case and the policy in the National Planning Policy Framework. In general terms, substantial harm is a high test, so it may not arise in many cases.' The implication being that 'substantial' harm represents a very high degree of impact.

6.5.172 The NPPF in paragraphs 193 to 196 sets out similar requirements relating to harm caused by development projects to the significance of heritage assets.

6.5.173 Having regard to these principles, it is considered that the Project would result in substantial harm to the following designated heritage assets (this is reflected at Table 6.9 of ES Chapter 6: Cultural Heritage (Application Document 6.1)) sited to the north of the River Thames:

a. Orsett Cropmark Complex (SM1) – Scheduled Ancient Monument

b. 1 and 2 Grays Corner Cottages (LB89) – Grade II listed buildings sited to the north of the River Thames near to the A1089/A13 junction.

c. Thatched Cottage (LB58) – A Grade II listed building sited to the north of the River Thames adjacent to 1 and 2 Grays Corner Cottages.

d. Murrells Cottages (LB96) – Grade II listed buildings located to the north of the River Thames on the south side of the A1013 Stanford Road, south of Orsett.

6.5.174 Each of these is addressed in turn.

Orsett Cropmark Complex

6.5.175 As set out above, it is considered that the permanent construction impacts of the Project to the Orsett Cropmark Complex (SM1) - which would be physically impacted by the construction of the Project and overhead line utility diversion (Works No. OH) and remove the buried archaeological remains from this multi-period site – would represent substantial harm in planning terms.

6.5.176 Paragraph 6.4.213 of ES Chapter 6: Cultural Heritage (Application Document 6.1) confirms that the setting of Orsett cropmark complex designated area currently straddles the A13 corridor and most of the rest of the area is under arable cultivation. Historic England's Heritage at Risk Register identifies ploughing as the principal vulnerability of (SM1) and describes its condition as '*declining*' and '*generally unsatisfactory with major localised problems*'. This description is considered to be contributed to by A13 and A1089 having previously been constructed through the designated area.

6.5.177 As outlined in the mitigation section above, and further detail provided in paragraph 6.6.84 of ES Chapter 6: Cultural Heritage (Application Document 6.1), the permanent physical impact of construction activity on the Orsett Cropmark Complex (SM1) would be mitigated by archaeological excavation and recording of the whole of the affected scheduled area. Design principles (Application Document 7.5) including the design of the structures in the junction and the landscape scheme have also been incorporated to minimise the impact on buried archaeology (Design Principle S11.04). However, the ES concludes that even after mitigation the Project would have a permanent impact of major adverse magnitude resulting in a large adverse effect.

6.5.178 As identified in the Scheme Objectives for the Project, '*minimising adverse effects on… the environment'* has been a consideration throughout the design development and route selection for the Project and in accordance with paragraph 5.131 great weight has been attached to the conservation of this heritage asset.

6.5.179 However, as set out in Chapter 5 (Project Evolution and Alternatives) of this Planning Statement, due to the designated assets location straddling the existing A13/A1089 junction and the necessity for the Project to provide links to the A13/A1089, and for those links to meet highway safety standards, there is no reasonable alternative route or design for the Project to avoid the designated heritage asset that would meet the need for and delivery the substantial public benefits of the Project as set out in Chapter 4 (Needs and Benefits) of this Planning Statement and in Application Document 7.1: Need for the Project.

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6.5.180 It is recognised that substantial harm to a Scheduled Monument should be 'wholly exceptional'. The specific circumstances of this Project, taking into account the compromising effect of existing development including the existing road infrastructure links, the mitigation measures, the overriding need for the Project and lack of feasible alternative routes, represent a clear and convincing justification which is considered to be 'wholly exceptional' and, therefore, the policy test of 5.131 is satisfied.

6.5.181 It is also considered that the public benefits of the Project as set out in Chapter 4 (Needs and Benefits) of this Planning Statement outweigh the harm to the

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significance of this heritage asset and therefore the Project accords with paragraph 5.132 of the NPSNN.

6.5.182 Accordingly, it is considered that the substantial harm to the designated heritage asset is necessary to deliver the substantial public benefits, as set out in Chapter 4 (Needs and Benefits) of this Planning Statement supported by Application Document 7.1: Need for the Project, that outweigh that harm and it is, therefore, considered that the Project accords with paragraph 5.133 of the NPSNN.

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1 and 2 Grays Corner Cottages

6.5.183 The Grade II listed buildings Nos. 1 and 2 Grays Corner Cottages (LB89) would be demolished during construction to enable construction of the A13/A1089/A122 Lower Thames Crossing junction and associated link roads. This loss would represent substantial harm in planning terms. Paragraph 5.131 of the NPSNN provides that substantial harm to or loss of Grade II listed buildings should be exceptional.

6.5.184 Paragraph 6.4.352 of ES Chapter 6: Cultural Heritage (Application Document 6.1) describes the setting of 1 and 2 Grays Corner Cottages confirming that whilst the buildings retain some evidential, aesthetic and historic interest the cottages are located on the west side of Baker Street, south-west of the centre of Orsett, where the setting has been highly eroded and truncated by the surrounding junction between the A1089 and A13.

6.5.185 As explained in the mitigation section above, and further detail provided in paragraph 6.6.127 of ES Chapter 6: Cultural Heritage (Application Document 6.1), building recording (REAC Ref. CH001; AMS-OWSI No.2; CH004) would take place for 1 and 2 Grays Corner Cottages. However, the ES concludes that the total removal of these assets would result in a permanent impact of major adverse, and a large adverse effect.

6.5.186 In accordance with paragraph 5.131 great weight has been attached to the conservation of this heritage asset as highlighted in the Scheme Objectives for Project which demonstrates consideration throughout the design development and route selection.

6.5.187 However, in accordance with paragraph 5.133 of the NPSNN, the Applicant has carefully considered alternatives before adopting the proposed route as expressed in ES Chapter 3: Assessment of Reasonable Alternatives (Application Document 6.1)) and Chapter 5 (Project Evolution and Alternatives) of this Statement. Specifically in regard to the Project alignment and its impact on the designated asset being located within the centre of the proposed A13/A1089 junction and to provide links that meet highway safety technical standards to the existing A13/A1089 roads; there is no reasonable alternative route or design for the Project to avoid the designated asset that would meet the need and deliver the substantial public benefits of the Project as set out in Chapter 4 (Needs and Benefits) of this Planning Statement and Application Document 7.1: Need for the Project.

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6.5.188 The feasibility of dismantling and reconstructing 1 and 2 Grays Corner Cottages in another location has been explored, however as the setting of the heritage asset would be removed, substantial harm to the Grade II listed building would remain.

6.5.189 It is recognised that substantial harm to a Grade II listed building should be 'exceptional'. The specific circumstances of this Project, taking into account the compromising effect of the existing A13/A1089 junction layout and the constraints of the existing road infrastructure links, the mitigation measures, the overriding need for the Project and lack of feasible alternative routes, represent a clear and convincing justification which is considered to be 'exceptional' and therefore the policy test of 5.131 is satisfied.

6.5.190 It is also considered that the public benefits of the Project as set out in Chapter 4 (Needs and Benefits) of this Planning Statement supported by Application Document 7.1: Need for the Project, outweighs the harm to the significance of this heritage asset and therefore accords with paragraph 5.132 of the NPSNN.

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6.5.191 Accordingly, it is considered that the substantial harm to the designated heritage asset is necessary to deliver the substantial public benefits, as set out in Chapter 4 (Needs and Benefits) of this Planning Statement and Application Document 7.1: Need for the Project, that outweigh that harm and it is, therefore, considered that the Project accords with paragraph 5.133 of the NPSNN.

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Thatched Cottage

6.5.192 The Grade II listed Thatched Cottage (LB58) would be demolished during construction to enable construction of the A13/A1089/A122 Lower Thames Crossing junction and associated link roads as the building is located where an embankment for the A122 would be constructed. This loss would represent substantial harm in planning terms (and, as above, paragraph 5.131 provides that such loss should be exceptional).

6.5.193 Paragraph 6.4.353 of ES Chapter 6: Cultural Heritage (Application Document 6.1) provides details on the setting of Thatched Cottage and highlights the proximity of the nearby junction between the A1089 and A13.

6.5.194 As outlined in the mitigation section above, and further detail provided in paragraph 6.6.127 of ES Chapter 6: Cultural Heritage (Application Document 6.1), building recording (REAC Ref. CH001; AMS-OWSI No. 2: CH004) would take place for Thatched Cottage. However, the ES concludes that the total removal of these assets would result in a permanent impact of major adverse, and a large adverse effect.

6.5.195 In accordance with paragraph 5.131 great weight has been attached to the conservation of this heritage asset as highlighted in the Scheme Objectives for Project which demonstrates consideration throughout the design development and route selection.

6.5.196 However, as set out in paragraph 5.133 of the NPSNN, ES Chapter 3: Assessment of Reasonable Alternatives (Application Document 6.1)) and Chapter 5 (Project Evolution and Alternatives) of this Statement, due to the designated asset being located where an embankment for the A122 would be constructed and the necessity to provide links that meet highway safety technical standards to the existing A13/A1089 roads; there is no reasonable alternative route or design for the Project to avoid the designated asset that would meet the need and delivery the substantial public benefits for the Project as set out in Chapter 4 (Needs and Benefits) of this Planning Statement supported by Application Document 7.1: Need for the Project.

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6.5.197 The feasibility of dismantling and reconstructing Thatched Cottage in another location has been explored, however, as the setting of the heritage asset would be removed, substantial harm to the Grade II listed building would remain.

6.5.198 It is recognised that substantial harm to a Grade II listed building should be 'exceptional'. The specific circumstances of this Project, taking into account the constraints of the existing A13/A1089 road junction layout, the mitigation measures, the overriding need for the Project and lack of feasible alternative routes, represent a clear and convincing justification which is considered to be 'exceptional' and therefore the policy test of 5.131 is satisfied.

6.5.199 It is also considered that the public benefits of the Project as set out in Chapter 4 (Needs and Benefits) of this Planning Statement and Application Document 7.1: Need for the Project outweigh the harm to the significance of this heritage asset and therefore accords with paragraph 5.132 of the NPSNN.

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6.5.200 Accordingly, it is considered that the substantial harm to the designated heritage asset is necessary to deliver the substantial public benefits, as set out in Chapter 4 (Needs and Benefits) of this Planning Statement, and Application Document 7.1: Need for the Project that outweigh that harm and it is, therefore, considered that the Project accords with paragraph 5.133 of the NPSNN.

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Murrells Cottages

6.5.201 Grade II listed Murrells Cottages (LB96) would be demolished to enable construction of the A13/A1089/A122 Lower Thames Crossing junction and associated link roads as the cottages are located where the realigned A1013 Stanford Road and embankment would be built. This loss would represent substantial harm in planning terms (and, as above, paragraph 5.131 provides that such loss should be exceptional).

6.5.202 As explained in the mitigation section above, and further detail provided in paragraph 6.6.127 of ES Chapter 6: Cultural Heritage (Application Document 6.1), building recording (REAC Ref. CH001; AMS-OWSI No.2; CH004) would take place for Murrells Cottages. However, the ES concludes that the total removal of these assets would result in a permanent impact of major adverse, and a large adverse effect.

6.5.203 Paragraph 6.4.358 of ES Chapter 6: Cultural Heritage (Application Document 6.1) describes the setting of Murrells Cottages confirming that the buildings are located on the south side of Stanford Road, south of Orsett, although the traffic on the A13 disturbs the tranquillity of the setting, harming the building's aesthetic value.

6.5.204 Murrells Cottages are sited to the south of the A1013 and between the Orsett Cock roundabout and A13/A1089 junction. The existing site is constrained with the alignment of the Rectory Road bridge and Orsett Showground to the north.

6.5.205 In accordance with paragraph 5.133 of the NPSNN, great weight has been attached to the conservation of this heritage asset with the Project progressing through an extensive design evolution and route alternative process to explore options that are reasonable to avoid substantial harm to Murrells Cottages.

6.5.206 The Project is constrained by the existing A13 alignment, the position of the existing Orsett Cock roundabout. To accommodate the Project link roads from the Orsett Cock roundabout to the A13 and the A1089, Rectory Road bridge

needs to be lengthened and raised. This is to provide space for the new link road in place of the existing west boundary slip road onto the A13 which needs to be removed to provide space for the A13 west bound link roads to the A122 both north and south bound. This consequently relocates the A1013 Stanford Road south, to accommodate the new link road and the new bridge piers resulting in a direct conflict between Murrells Cottages and the relocated A1013 Stanford Road and new embankments to accommodate the raised road profile. The design and positioning of the Project link roads are constrained by highway safety standards to ensure there is sufficient distance and sightlines to allow weaving space for diverging and emerging traffic from the link roads and the A13.

6.5.207 An alternative design that would have avoided the loss of Murrells Cottages was considered during the early route consultation in 2016. Instead of providing free flowing link roads from the A13 to A122, the alternative design provided a link from the A122 to the A13 via the grade separated Orsett Cock roundabout. Subsequent traffic modelling for this alternative option predicted high flows of traffic onto the Orsett Cock roundabout which would have caused highway safety concerns and capacity issues for the link between the A122 and A13.

6.5.208 It is also considered that the dismantling and reconstructing Murrells Cottages would not avoid or mitigate the substantial harm to the significance of the Grade II listed building as the existing setting and function would still be lost.

6.5.209 In accordance with paragraph 5.133 of the NPSNN the details above and outlined in ES Chapter 3: Assessment of Reasonable Alternatives (Application Document 6.1)) confirm that the loss of Murrells Cottages is necessary and there is no reasonable alternative route or design for the Project to avoid the loss of the designated asset that would meet the need and delivery the substantial public benefits for the Project as set out in Chapter 4 (Needs and Benefits) of this Planning Statement and Application Document 7.1: Need for the Project.

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6.5.210 It is recognised that substantial harm to a Grade II listed building should be 'exceptional'. The specific circumstances of this Project, having regard to the constraints of the existing A13 road alignment, the mitigation measures, the overriding need for the Project and lack of feasible alternative routes, represent a clear and convincing justification which is considered to be ‘exceptional’ and therefore the policy test of 5.131 is satisfied.

6.5.211 It is also considered that the public benefits of the Project as set out in Chapter 4 (Needs and Benefits) of this Planning Statement supported by Application Document 7.1: Need for the Project, outweigh the harm to the significance of this heritage asset and therefore accords with paragraph 5.132 of the NPSNN.

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6.5.212 Accordingly, it is considered that the substantial harm to the designated heritage asset is necessary to deliver the substantial public benefits, as set out in Chapter 4 (Needs and Benefits) of this Planning Statement and Application Document 7.1: Need for the Project, that outweigh that harm and it is, therefore, considered that the Project accords with paragraph 5.133 of the NPSNN.

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Summary of substantial harm

6.5.213 The analysis above has demonstrated that the substantial harm and loss of each of the designated heritage assets outlined above is necessary in order to

facilitate the Project and that there are no other reasonable means of achieving the Project's substantial benefits. Whilst it is recognised that such substantial harm should be 'exceptional' in relation to the listed buildings and 'wholly exceptional' in relation to the Scheduled Monument they are justified in order to deliver the substantial benefits the Project would deliver. The Project, therefore, satisfies the relevant policy tests of 5.131 to 5.133 of the NPSNN.

Less than substantial harm

6.5.214 Paragraph 5.134 of the NPSNN states that:

6.5.215 'Where the proposed development will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal, including securing its optimum viable use.'

6.5.216 ES Chapter 6: Cultural Heritage (Application Document 6.1) provides an assessment of the impact of the Project on heritage assets within the order limits which would result in less than substantial harm to the significance of a designated heritage asset. Table 6.7 within ES Chapter 6: Cultural Heritage provides a summary of cultural heritage significant effects.

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6.5.217 The Project would have a significant impact on following heritage assets in the South of the River Thames section that would result in less than substantial harm during the construction phase:

a. Temporary impacts to five Grade II listed buildings (LB22, LB25, LB30, LB99, LB78)

b. Temporary impacts to Filborough Farm (1147)

c. Temporary impact to Thong (CA10) Conservation Area

6.5.218 The Project would have a significant impact on following heritage assets in the North of the River Thames section that would result in less than substantial harm during the construction phase:

a. Temporary impact to Causewayed enclosure and Anglo-Saxon cemetery 500m east-north-east of Heath Place (SM6)

b. Temporary impacts to Grade II listed buildings: Heath Place (LB41), Polwicks (LB48), Walnut Tree Cottage (LB49), Thatched Barn at Whitfields (LB52), Baker Street Windmill (LB57), Whitfields (LB60), Buckland (LB66)

c. Temporary impacts to one Grade I listed building Church of St Mary Magdalene (LB69)

d. Temporary impacts to North Ockendon (CA4), East Tilbury (CA6) and West Tilbury (CA7) Conservation Areas

e. Permanent impact to Grade II listed buildings: White Horse Cottage (LB22), Whitecrofts Farmhouse (LB37)

f. Permanent impact to six low-value built heritage assets (4153, 4154, 4155, 4156, 4157, 4159)

6.5.219 The Project would have a significant permanent impact to Thong (CA10) Conservation Area in the South of the River Thames section that would result in less than substantial harm during the operational phase.

6.5.220 The Project would have a significant impact on following heritage assets in the North of the River Thames section that would result in less than substantial harm during the operational phase:

a. Permanent impact to designated Causewayed enclosure and Anglo-Saxon cemetery 500m east-north-east of Heath Place (SM6)

b. Permanent impacts to North Ockendon (CA4), East Tilbury (CA6) and West Tilbury (CA7) Conservation Areas

c. Permanent impacts to Grade II listed buildings: Whitecrofts Farmhouse (LB37), Baker Street Windmill (LB57), Hole Farmhouse (LB153)

6.5.221 The substantial public benefits of the Project have been summarised in Chapter 4 (Needs and Benefits) of this Statement and the Need for the Project (Application Document 7.1) along with the substantial public benefits demonstrate a compelling case in favour of delivery of the Project that overrides the less than substantial harm to heritage assets. The Project therefore complies with paragraph 5.134 of NPSNN. The equivalent paragraph is 5.8.15 of the NPS EN-1 (5.9.24 of the draft NPS EN-1).

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Summary

6.5.222 Mitigation has been proposed to avoid, reduce or compensate for adverse impacts to heritage assets in accordance with paragraph 5.139 of the NPSNN. In line with Requirement 9 of the draft DCO mitigation in terms of evaluation and recording of archaeological assets will be undertaken. The ES Chapter 6: Cultural Heritage (Application Document 6.1) concludes that the Project will have construction and operational effects on archaeological remains, built heritage, historic landscapes and the paleoenvironmental and geoarchaeological resource.

6.5.223 The assessment of effects on cultural heritage, reported in the ES Chapter 6: Cultural Heritage (Application Document 6.1), has identified substantial harm to heritage assets. That harm is justified by the wholly exceptional circumstances that exist in this case in light of the need for and substantial public benefits of the Project, as set out in detail in relation to the impact on the scheduled monument and exceptional in respect of the grade II listed buildings; however, this would be outweighed by the substantial public benefits of the Project, as set out in detail in the Need for the Project (Application Document 7.1) and Chapter 4 (Needs and Benefits) of this Statement.

6.5.224 The assessment reported in the ES Chapter 6: Cultural Heritage (Application Document 6.1), has also identified less than substantial harm to heritage assets which would be outweighed by the substantial public benefits of the Project, as set out in detail in the Need for the Project (Application Document 7.1) and Chapter 4 (Needs and Benefits) of this Statement.

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6.5.225 It is, therefore, considered that the Project accords with the policies relating to the historic environment set out in the NPSNN and NPS EN-1 (and, in so far as it is relevant to this Project, the draft NPS EN-1).

Landscape and visual

Introduction

6.5.226 In accordance with paragraphs 5.143 to 5.161 of the NPSNN and 5.9.1 to 5.9.23 of the NPS EN-1 (paragraphs 5.10.1 to 5.10.25 of the draft NPS EN-1), ES Chapter 7: Landscape and Visual (Application Document 6.1) sets out the assessment of the likely significant effects of the Project on the landscape resource and on visual receptors during construction and operation. Landscape considerations include landscape features and elements, landscape character and areas of particular value such as designated landscapes and conservation sites. Visual considerations include visual amenity and views experienced by people from publicly accessible viewpoints and nearby buildings, including residential properties. This section of the planning statement provides an overview of the landscape and visual impacts across the Project as a whole.

6.5.227 Paragraphs 5.150 to 5.153 of the NPSNN set out the specific policy requirements for development proposed within nationally designated landscapes, including in National Parks, the Broads and AONBs. ES Chapter 2 (Project Description (Application Document 6.1)) confirms that the Project passes through the West Kent Downs Landscape Character Area of the Kent Downs AONB. Consideration of paragraphs 5.150 to 5.155 is undertaken in Appendix F of this Statement.

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6.5.228 Paragraphs 5.144 to 5.146 of the NPSNN (and paragraphs 5.9.5 and 5.9.7 of the NPS EN-1 and draft paragraphs 5.10.5 and 5.10.7 of the NPS EN-1) state that Applicants should undertake an assessment of any likely significant landscape and visual impacts in the Environmental Impact Assessment.

6.5.229 ES Chapter 7: Landscape and Visual (Application Document 6.1) includes an assessment of the Project's impacts on landscape character of the nationally designated Kent Downs Area of Outstanding Natural Beauty (AONB) within the Kent section, National Character Areas (NCA) and locally designated Local Landscape Character Areas (LLCA).

6.5.230 Traffic and Noise effects on the AONB are considered in ES Appendix 7.11 (Traffic and Noise Effects on the Kent Downs AONB (Application Document 6.3).

6.5.231 In accordance with paragraph 5.147 of the NPSNN and paragraph 5.9.9 of the NPS EN-1 (paragraph 5.10.11 of the draft NPS EN-1), ES Chapter 7: Landscape and Visual (Application Document 6.1) concludes that as the Project would affect the Kent Downs AONB the respective duties in section 11A of the National Parks and Access to Countryside Act 1949 and section 85 of the Countryside and Rights of Way Act 2000 should be taken into consideration (ES Appendix 7.14 (Application Document 6.3)).

6.5.232 Appendix F attached to this Planning Statement provides an assessment of the planning issues raised by the location of the Project within the Kent Downs AONB. It provides an assessment of the Project's impact on the AONB and a justification for its partial location within its boundary against the exceptional circumstances criteria set out in paragraph 5.148 of the NPSNN which states that:

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> 'For significant road widening or the building of new roads in National Parks and the Broads applicants also need to fulfil the requirements set out in Defra's English national parks and the broads: UK government vision and circular 2010 or successor documents. These requirements should also be complied with for significant road widening or the building of new roads in Areas of Outstanding Natural Beauty.'

6.5.233 Appendix F attached to this Planning Statement explains in detail how the Project accords with the Key Outcomes in Defra's English national parks and the broads: UK government vision and circular 2010 with the exception of outcome (d) which focuses on the delivery of affordable housing and communications infrastructure and is not considered relevant to the Project demonstrating how the requirements of the Circular have been fulfilled.

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6.5.234 In accordance with the policy to minimise landscape impacts in paragraph 5.149 of the NPSNN the Project has a set of design principles that have been established based upon 22 Local Landscape Character Areas (LLCAs) and how these have been embedded into the design process to address landscape impacts. The Project has been carefully designed incorporating National Highways' 10 Design Principles of good road design which drives a context-based design response in integrating structures within their setting, ensuring a positive contextual intervention. Mitigation measures are detailed within ES Figure 2.4: Environmental Management Plan (Application Document 6.2) secured by Requirement 4 of the draft DCO (Application Document 3.1), showing both construction phase and operational phase mitigation.

6.5.235 The Project is, therefore, in accordance with paragraphs 5.159, 5.160 and 5.161 of the NPSNN (and paragraphs 5.9.21 to 5.9.23 of the NPS EN-1 and 5.10.23 to 5.10.25) by carefully incorporating design principles that mitigate potential impacts on the landscape and providing reasonable mitigation and enhancement measures to minimise harm to the landscape.

Development within nationally designated areas

6.5.236 In accordance with NPSNN paragraph 5.150 the Project has given great weight to the conservation of the Kent Downs AONB. Appendix F attached to this Planning Statement has demonstrated the high environmental standards and embedded mitigation measures that have been included in the Project to conserve and enhance the Kent Downs AONB.

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6.5.237 Accordance with NPSNN paragraphs 5.151 to 5.153 and 5.9.9 to 5.9.10 of the NPS EN-1 (and 5.10.11 and 5.10.12 of the draft NPS EN-1) is demonstrated in Appendix F of this Planning Statement which provides evidence of the exceptional circumstances for developing in the AONB, which is in the public interest.

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6.5.238 The Project has also presented environmental enhancements including nitrogen deposition compensation planting sites and new circular walks which go beyond the existing baseline and would benefit varied aspects of the AONB environment. These environmental enhancements are secured by reference to the Register of Environmental Actions and Commitments (REAC) (Application Document 6.3), the Environmental Management Plan (Application Document 6.2) secured through Schedule 2 Part 1 Requirement 4 of the draft DCO

(Application Document 3.1), and the Design Principles (Application Document 7.5).

Development outside of nationally designated areas which might affect them

6.5.239 Paragraph 5.154 of the NPSNN (paragraph 5.9.12 of the NPS EN-1 and 5.10.14 of the draft NPS EN-1) states:

> 'The duty to have regard to the purposes of nationally designated areas also applies when considering applications for projects outside of the boundaries of these areas which may have impacts within them. The aim should be to avoid comprising the purposes of designation and such projects should be designed sensitively given the various siting, operational, and other relevant constraints. This should include projects in England which may have impacts on designated areas in Wales or on national Scenic Areas in Scotland.'

6.5.240 In applying paragraph 5.154 of the NPSNN (paragraph 5.9.12 of the NPS EN-1 and 5.10.14 of the draft NPS EN-1) it should be noted that ES Chapter 7: Landscape and Visual (Application Document 6.1) assesses the impact of the development outside the AONB and aims to avoid compromising the purposes of its designation through sensitive siting and design.

6.5.241 Outside of the AONB, construction works for the M2/A2/Lower Thames Crossing junction and the extensive southern tunnel entrance compound would result in the significant visual effects to the Higham Arable Farmland landscape receptor.

6.5.242 In accordance with paragraph 5.155 of the NPSNN the fact that the Project would be visible from within the AONB and have a significant adverse effect on the setting of the AONB should not in itself be a reason for refusing consent for the proposed development. Nonetheless, as outlined in Section 7.5 of ES Chapter 7: Landscape and Visual (Application Document 6.1), the Project demonstrates that embedded mitigation and design principles have been included and secured by reference to the Register of Environmental Actions and Commitments (REAC) (Application Document 6.3) and Environmental Management Plan (Application Document 6.2), secured through Requirement 4 of the draft DCO (Application Document 3.1), and the Design Principles (Application Document 7.5), secured through Requirement 3 of the draft DCO. These mitigation measures and design principles minimise harm identified to landscape impacts outside of nationally designated areas.

Residual impacts in other areas

6.5.243 Paragraph 5.156 of the NPSNN (also at paragraph 5.9.14 of the NPS EN-1 and 5.10.16 of the draft NPS EN-1) states:

> 'Outside of nationally designated areas, there are local landscapes that may be highly valued locally and protected by local designation. Where a local development document in England has policies based on landscape character assessment, these should be given particular consideration. However, local landscape designations should not be used in themselves as reasons to refuse consent, as this may unduly restrict acceptable development.'

6.5.244 Paragraph 5.157 of the NPSNN (also at paragraph 5.9.17 of the NPS EN-1 and 5.10.19 of the draft NPS EN-1) states:

> 'In taking decisions, the Secretary of State should consider whether the project has been designed carefully, taking account of environmental effects on the landscape and siting, operational and other relevant constraints, to avoid adverse effects on landscape or to minimise harm to the landscape, including by reasonable mitigation.'

6.5.245 ES Chapter 7: Landscape and Visual (Application Document 6.1) highlights large adverse impacts to the West Kent Downs LCA, very large adverse impacts to the Higham Arable Farmland (sub-area Thong) and Higham Arable Farmland (sub area Chalk) very large adverse impacts as a result of vegetation loss and siting of construction compounds during the construction of the Project.

6.5.246 ES Chapter 7: Landscape and Visual (Application Document 6.1) states that to the north of the river, there would be large adverse effects on the landscape character of the West Tilbury Fringe, White Croft/Orsett Heath Urban Fringe and Thurrock Reclaimed Fen (sub area Mardyke) LLCAs and moderate significant adverse effects on seven other LLCAs.

6.5.247 To the north of the River Thames, the main visual effects during construction would result from the construction of sculptural landscape mounding within Tilbury Fields, the extensive northern tunnel entrance compound and construction works for the Project road and associated structures and other construction compounds.

6.5.248 Tables 7.23 and 7.24 of ES Chapter 7: Landscape and Visual (Application Document 6.1) reports that there would also be moderate significant adverse effects which are considered significant in EIA terms on several individual or groups of visual receptors where the influence of vegetation removal and construction works would be more limited.

6.5.249 To the north of the river, the main visual effects during operation would result from Tilbury viaduct, the A13/A1089/A122 Lower Thames Crossing junction and the Project road and associated viaducts crossing Orsett Fen.

6.5.250 As outlined in Section 7.5 of ES Chapter 7: Landscape and Visual (Application Document 6.1) significance of the effect is mitigated through the embedded mitigation and design principles included and secured by reference to the Register of Environmental Actions and Commitments (REAC) (Application Document 6.3) and Figure 2.4: Environmental Masterplan (Application Document 6.2), secured through Requirement 4 of the draft DCO (Application Document 3.1), and the Design Principles (Application Document 7.5), secured through Requirement 3 of the draft DCO. This includes the following:

a. West Kent Downs – Higham Arable Farm (sub area Thong): Design Principles relating to earthwork design; green bridges, species rich grassland; woodland, tree and scrub planting; hedgerows; wetland planting.

b. West Kent Downs – Higham Arable (sub area Chalk): Design Principles relating to earthwork design; species rich grassland; woodland, tree and scrub planting. Hedgerows; cascading water bodies and hard landscaping of tunnel portal buildings.

c. West Tilbury Fringe: Design Principles for Tilbury Viaduct; Tilbury Fields; species rich grassland; woodland, tree and scrub planting, hedgerows; water bodies and hard landscaping including the tunnel portal buildings.

d. White Croft/Orsett Heath Urban Fringe: Design Principles relating to earthwork design; green bridges, species rich grassland; woodland, tree and scrub planting; hedgerows, wetland planting; lighting on elevated road sections.

e. Thurrock Reclaimed Fen (sub area Mardyke): Design Principles relating to earthwork design; Mardyke viaduct; green bridges; species rich grassland; woodland, tree and scrub planting; hedgerows; wetland planting and hard landscaping such as the retaining structure at Franks Farm.

6.5.251 These mitigation measures and design principles minimise harm identified to landscape impacts outside of nationally designated areas. The Project is, therefore, in accordance with paragraphs 5.156 and 5.157 of the NPSNN and paragraphs 5.9.14 and 5.917 of the NPS EN-1 and 5.10.16 and 5.10.19 of the draft NPS EN-1.

Visual Impact

6.5.252 Paragraph 5.158 of the NPSNN states:

> 'The Secretary of State will have to judge whether the visual effects on sensitive receptors, such as local residents, and other receptors, such as visitors to the local area, outweigh the benefits of the development.'

6.5.253 The assessment of the landscape and visual impacts associated with the Project is set out within ES Chapter 7: Landscape and Visual (Application Document 6.1) and follows the methodology set out in DMRB LA 107 Landscape and Visual Effects Rev 2 (Highways England, 2020). ES Chapter 7 provides a description of the landscape character of the defined study area for the Project and the residual visual effects from representative viewpoints within designated landscape areas.

6.5.254 Table 7.35 in ES Chapter 7: Landscape and Visual (Application Document 6.1) provides a summary of visual impacts, taking into account the Project design and mitigation.

6.5.255 Tables 7.29, 7.30, 7.31, 7.32 in ES Chapter 7: Landscape and Visual (Application Document 6.1) detail that there would be moderate and large adverse effects which are considered significant in EIA terms on several individual or groups of visual receptors where the influence of the operational Project road would be more limited.

6.5.256 It is demonstrated in the mitigation section (Section 7.5 of ES Chapter 7: Landscape and Visual (Application Document 6.1)) that design principles and extensive planting mitigation would limit visual effects on sensitive receptors and as highlighted above the visual effects on landscape character and views would generally reduce by year 15 of operation (summer of design year) once mitigation planting has established (as reported in ES Chapter 7: Landscape and Visual, Tables 7.29 to 7.32).

6.5.257 Mitigation measures include replacement of land and landscape features, proposed green bridge structures along the Project route and extensive woodland planting at the junctions, as well as further additional linear planting and wider hedgerow reinstatement adjacent to the Project route to aid visual screening and landscape integration. In addition, typically 4m high false cutting earthworks would provide permanent visual screening from certain locations.

6.5.258 In response to paragraph 5.152 of the NPSNN the substantial public benefits of the Project have been outlined. Therefore, the Project is considered to be in accordance with NPSNN 5.158 and paragraph 2.8.6 of the NPS EN-5 and 2.11.10 of the draft NPS EN-5 by demonstrating that design principles have been incorporated into the Project to mitigate visual effects on sensitive receptors and that any remaining visual effects would be outweighed by the substantial public benefits of the Project.

Mitigation

6.5.259 In accordance with paragraphs 5.159, 5.160 and 5.161 of the NPSNN (and paragraphs 5.9.21 to 5.9.23 of the NPS EN-1 and 5.10.23 to 5.10.25) ES Chapter 7: Landscape and Visual (Application Document 6.1), Section 7.5 details that the Project includes a range of environmental commitments at a project wide level and fall into the following categories:

a. Embedded mitigation

b. Good practice

c. Essential mitigation

6.5.260 The construction phase embedded mitigation relates to the following:

a. Reduce permanent land acquisition by reinstating construction working areas to previous land use wherever practicable and not required for environmental mitigation.

b. Reduce loss of existing vegetation throughout the Project wherever practicable. Commitment to the protection and retention of vegetation shown to be retained on Figure 2.4: Environmental Masterplan (Application Document 6.2) secured through Requirement 4 of the draft DCO (Application Document 3.1)) to aid visual screening and landscape integration of construction activity as well as the operational Project. (Retained vegetation shown on the Environmental Masterplan takes account of vegetation removal required to accommodate the Project and utilities.)

c. Reinstatement of land utilised during construction to its original use as far as technically practicable in consultation with the landowner where required, as referenced in Clause LSP.05 of the Design Principles (Application Document 7.5)

6.5.261 In accordance with paragraph 5.161 of the NPSNN a planting design strategy shall be developed for the Project as a set out in the Design Principles (Application Document 7.5). This details where practical, the use of trees, shrub and grassland species to provide landscape mitigation in the form screening and integration.

6.5.262 In accordance with paragraphs 5.159 to 5.161 of the NPSNN Table 7.14 of ES Chapter 7: Landscape and Visual (Application Document 6.1) details the landscape and visual construction phase essential project wide mitigation measures which include:

a. Hedgerow habitat lost during construction would be compensated by creating new hedgerows at locations shown on the Environmental Masterplan, using native species of local provenance. (REAC Ref: TB001)

b. Detailed design for the alignment of the Project, including diverted utilities, to reduce the removal of trees and vegetation as far as reasonably practicable (REAC Ref: LV001)

c. Where excavation for installation of utilities would require the removal of ancient woodland, trees subject to tree preservation orders or hedgerows subject to the Hedgerows Regulations 1997, trenchless installation methods will be used to avoid removal where reasonably practicable, unless this would give rise to new or materially different environmental effects. (REAC Ref: LV013)

d. An Arboricultural Method Statement and Tree Protection Plan would be prepared in accordance with BS 5836:2012 identifying measures for the protection of retained trees and woodland prior to the commencement of site clearance works (REAC Ref: LV028)

e. Protection of ancient trees, ancient woodland and veteran trees from dust and pollution (REAC Ref: LV030)

f. Hulks of felled veteran trees would be relocated in close proximity to a nearby veteran tree, woodland or parkland area. (REAC Ref: LV031)

g. A minimum of 30 individual specimen trees would be planted as a replacement for lost veteran trees. (REAC Ref: LV032)

Summary

6.5.263 ES Chapter 7: Landscape and Visual (Application Document 6.1) paragraph 7.9.22 concludes that although there would be some very large and large adverse effects arising from the Project, these would be localised due to extensive mitigation proposals which would help screen views of the new road and reinstate landscape features removed to facilitate construction. For the most part, effects of the Project would have landscape and visual impacts which are assessed as moderate or below. It is therefore concluded that the Project would result in a combined moderate adverse significance of overall landscape and visual effect on the existing landscape and visual amenity, which is considered significant in the context of the EIA Regulations. However, it is considered that the overriding need for the Project outweighs the significant residual effects and Appendix F of this Planning Statement provides significant 'exceptional circumstance' public benefits and enhancements of relevance to the Project in justifying its development within the AONB. Overall, the Project accords with the requirements of the NPSNN and the energy NPSs; NPS EN-1, NPS EN-4 and NPS EN-5 (and in so far as they are relevant to this Project, the draft NPS EN-1, NPS EN-4 and NPS EN-5).

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Land use including open space, green infrastructure and green belt

6.5.264 The NPSNN recognises the importance of high quality open space, green infrastructure (GI) and countryside (paragraph 5.162). It recognises the importance of maximising the re-use of previously developed land (PDL) to reduce the amount of undeveloped land which needs to be used. However, it also recognises that, for some forms of infrastructure, particularly linear infrastructure such as roads, use of PDL may not be possible (paragraph 5.163). The same point is made in respect of energy infrastructure projects at paragraph 5.10.2 of the NPS EN-1 (and 5.11.2 of the draft NPDEN-1).

6.5.265 Paragraph 5.10.1 of NPS EN-1 (5.11.1 of the draft NPS EN-1) notes that energy infrastructure projects may have particular effects on open space including green infrastructure due to their likely locations.

Open Space & Green Infrastructure

6.5.266 In demonstrating accordance with paragraph 5.165 of the NPSNN, detailed assessment against policy can be found in Appendix D: Open Space and Appendix G: Private Recreational Facilities of this Planning Statement.

6.5.267 Other matters relating to local development plans, as referred to at NPSNN paragraph 5.165, relevant to the Project are addressed in Chapter 7: Other matters of potential relevance and importance, of this Planning Statement which addresses the consequences of the Project for other local development proposals and the development plan. Additionally, ES Chapter 13 (Population and Human Health (Application Document 6.1)) assesses the impacts of the Project on land allocated for development by Local Authorities.

6.5.268 Paragraph 5.166 of the NPSNN states that:

> 'Existing open space, sports and recreational buildings and land should not be developed unless the land is surplus to requirements or the loss would be replaced by equivalent or better provision in terms of quantity and quality in a suitable location.'

6.5.269 Paragraph 5.174 of the NPSNN nonetheless provides that the loss of such facilities may be justified and states that (also at paragraph 5.10.14 of the NPS EN-1 and 5.11.13 of the draft NPS EN-1):

> 'The Secretary of State should not grant consent for development on existing open space, sports and recreational buildings and land, including playing fields, unless an assessment has been undertaken either by the local authority or independently, which has shown the open space or the buildings and land to be surplus to requirements, or the Secretary of State determines that the benefits of the project (including need) outweigh the potential loss of such facilities, taking into account any positive proposals made by the applicant to provide new, improved or compensatory land or facilities.'

6.5.270 Paragraph 5.181 of the NPSNN (also at paragraph 5.10.21 of the NPS EN-1 and 5.11.20 of the draft NPS EN-1) relates to the mitigation of adverse effects on green infrastructure or open space arising from development on open space land.

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6.5.271 Paragraph 5.184 of the NPSNN (paragraph 5.10.24 of the NPS EN-1) recognises Public Rights of Way (PRoW) and other access land as important recreational facilities for walkers, cyclists and pedestrian. It identifies the mitigation measures Applicants are expected to take to address adverse effects on green infrastructure.

6.5.272 In accordance with these requirements a full assessment of the impacts of the Project on existing areas of open space, recreational facilities and green infrastructure has been carried out and is presented in Appendix D: Open Space, Appendix G: Private Recreational Facilities and Appendix H: Green Infrastructure Study to this Planning Statement. They identify the areas affected, the reason and justification for identified impacts and the measures proposed to mitigate and compensate for those impacts.

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6.5.273 Overall, it is considered that the measures identified in Appendices Appendix D, Appendix G and Appendix H demonstrate that the Project accords with the relevant provisions of the NPSNN and NPS EN-1 in so far as impacts on open space, recreational facilities and green infrastructure are concerned.

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6.5.274 The NPSNN requires Applicants to take into account impacts on soil quality, contamination and the best and most versatile agricultural land (BAMVAL) (paragraph 5.168), minerals resources (paragraph 5.169) and Green Belts (paragraph 5.170). The same points are made in paragraphs 5.10.8 to 5.10.11 of the NPS EN-1 (5.11.8 to 5.11.11 of the draft NPS EN-1).

6.5.275 Soil quality and contamination are covered in the section of this chapter of the Planning Statement dealing with waste management.

Green Belt

6.5.276 Paragraph 5.170 of the NPSNN establishes a general presumption against inappropriate development in the Green Belt. Inappropriate development should not be approved unless very special circumstances exist. Paragraph 5.178 requires the SoS to consider carefully whether such circumstances exist and whether any harm is outweighed by other considerations and to attach substantial weight to the harm to the Green Belt

6.5.277 Appendix E to this Statement provides a detailed assessment of the case for the Project within the Green Belt in order to show that very special circumstances exist sufficient to justify the location of the development in the Green Belt and so demonstrate accordance with the relevant requirements of the NPSNN and Energy NPSs, and as far as this may be relevant, consistency with other relevant national and local Green Belt policies.

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Best & Most Versatile Agricultural Land

6.5.278 Paragraphs 5.168 and 5.176 of the NPSNN (and the equivalent paragraph 5.10.8 and 5.10.15 of the NPS EN-1 and 5.11.8 and 5.11.14 of the draft NPS EN-1) set out that Applicants should recognise the importance of the Best and Most Versatile (BMV) land and to prioritise the use of areas of poorer quality in preference to the BMV land and minimise impacts on soil quality.

6.5.279 To address the policies in the NPSNN and NPS EN, ES Chapter 10: Geology and Soils (Application Document 6.1) presents an assessment of likely significant effects on soil resources and best and most versatile land. Agricultural Land Classification (ALC) surveys have been undertaken to

characterise the agricultural soils and identify areas of Best and Most Versatile Land. ES Appendix 10.4: Agricultural Land Classification Factual Report (Application Document 6.3) presents the outputs of the survey and has informed the baseline of ES Chapter 10.

6.5.280 The characteristics of the soils present, and the value of the agricultural land this supports, are influenced by a range of factors, including geology, climate, topography and land use. Land considered to be BMV agricultural land makes up approximately 54% of the land needed for the Project to the south of the River Thames and approximately 25% of the land needed to the north of the River Thames. It should be noted however that over half of the BMV land within the order limits is within the lowest BMV land category (Grade 3a), with only a very small proportion (approximately 3%) within the highest BMV land category (Grade 1).

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6.5.281 The Applicant has taken reasonable and practicable steps to minimise and mitigate for these impacts such that accordance with the NPS' is demonstrated. The design has been optimised to minimise the land take required to construct and operate the Project. Through the route optioneering phase and design development, consideration has been given to the presence of higher quality agricultural land alongside other environmental and design constraints.

6.5.282 Where agricultural land cannot be avoided, the Applicant has identified soil management measures to minimise the adverse effects of soil disturbance and handling during the construction phase. These are described in full in ES Chapter 10: Geology and Soils (Application Document 6.1) and secured through their inclusion in the REAC (Appendix 2.2, Application Document 6.3). They include but are not limited to:

6.5.283 Procedures for the management and handling of soils to allow their sustainable reuse in line with the Defra Construction Code of Practice for the Sustainable Use of Soil on Construction Sites (2009) and the MAFF Good Practice Guide for Handling Soils (2000).

a. Procedures for the restoration of soils on land to be returned to landowners

b. Implementation of a five-year aftercare period

c. Implementation of an agricultural liaison officer during construction activities on agricultural land

6.5.284 During construction the Project would result in the total loss of 1,534.51ha of agricultural land at the start of the construction phase. A total of 770.94ha comprises BMV land. However, by the end of the construction phase, land required temporarily would be reinstated, leaving a permanent loss of 577.77ha of agricultural land. Of this land affected permanently, 225.57ha is within Grade 3a, 229.70ha is within Grade 2 and just 22.5ha is within the highest BMV land category (Grade 1).

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6.5.285 Nonetheless, Section 10.6 of ES Chapter 10: Geology and Soils (Application Document 6.1) acknowledges that the loss of BMV land reported represents a very large adverse effect, both during the construction phase and following reinstatement of temporary land, which is significant.

6.5.286 Whilst, to a degree, there is partial mitigation of these impacts by virtue of the reinstatement of BMV land post completion of the works, it is not possible to fully mitigate the residual impact the large adverse effect in the study area. Given the proportion of BMV land in the east of England, this effect is an inevitable result of implementing the Project in this location. In this regard, the adverse effect has to be weighed in the balance against the multitude of benefits the Project would deliver which are addressed in Chapter 4 (Needs and Benefits) of this Planning Statement.

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6.5.287 The loss of BMV land also needs to be considered in the context set by the NPSNN which does not preclude the use of land in high ALC grades. As noted above, the NPSNN (paragraph 5.168) puts the onus on Applicants, where significant development of BMV land may be necessary, to:

a. Demonstrate why this may be necessary – the Project has followed a robust options selection process and assessed alternatives against a range of constraint as detailed in Chapter 5: Project Evolution and Alternatives of this Planning Statement;

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b. Show that they have sought to use areas of poorer quality land in preference to that of higher quality – during design refinement process the Project maximised opportunities to avoid the best quality agricultural land has been included, for example in the identification of nitrogen deposition compensation site, the best and most versatile agricultural land was excluded from the site selection process; and

c. Seek to identify any effects and seek to minimise their impact on soil quality taking into account mitigation measures proposed – for example the commitments to protect soils during construction through the Environmental Master Plan (Application Document 6.2) and ES Appendix 2.2 CoCP (Application Document 6.3)).

6.5.288 This is addressed in ES Chapter 10: Geology and Soils (Application Document 6.1). In terms of embedded mitigation, paragraph 10.5.4 notes that:

> 'The principles of avoidance were applied during the selection of the preferred route which considered the presence of BMV land and areas of potential contamination risk. Additionally, the existing baseline conditions have helped to inform the siting of construction compounds, the construction approach and the development of the Project design.'

Conclusion

6.5.289 Taken together in terms of impacts on Green Belt, open space, GI, soil quality, contamination and BAMVAL, while there are acknowledged impacts as described above, overall, the net benefit delivered by the Project are considered to outweigh any adverse impacts such that the Project can be considered to accord with the policy set out in the NPSNN paragraphs 5.165,5.166,5.168, 5.169, 5.170, 5.174, 5.176, 5.181 and 5.184.

Noise and vibration

6.5.290 In accordance with NPSNN paragraph 5.189 (also at paragraph 5.11.4 of the NPS EN-1 / 5.12.4 of the draft NPS EN-1) ES Chapter 12: Noise and Vibration

(Application Document 6.1) considers the potential sources of noise over both the construction and operational phases, identifies noise-sensitive receptors and describes measures to mitigate and minimise any identified adverse impacts on health and quality of life from noise. These measures are set out in the REAC (which forms part of the CoCP, Application Document 6.3) along with the Design Principles document (Application Document 7.5) which would be legally secured through Requirements 4 and 3 respectively, of the draft DCO (Application Document 3.1).

6.5.291 As required by NPSNN paragraph 5.190 the likely impacts have been considered along the Project corridor, adjacent to the bypassed routes and along any other affected links identified as experiencing a 1dB change in road traffic noise as a result of the Project. The likely impacts elsewhere on the national network have been assessed within Section 12.6 of ES Chapter 12: Noise and Vibration (Application Document 6.1).

6.5.292 In accordance with NPSNN paragraph 5.191, appropriate UK guidance and British Standards relating to construction and operational noise and vibration impacts of the Project have been followed as detailed within ES Chapter 12: Noise and Vibration (Application Document 6.1).

6.5.293 In accordance with NPS EN-5 (2.12.9 of the draft NPS EN-5) paragraph 2.9.9, appropriate UK guidance relating to operational noise impacts associated with electricity transmission infrastructure has been followed as detailed within ES Chapter 12: Noise and Vibration (Application Document 6.1).

6.5.294 In accordance with NPSNN paragraph 5.192 (and paragraph 5.11.7 of NPS EN-1) which requires applicants to consult with Natural England regarding the '*assessment of noise on designated nature conservation sites, protected landscapes, protected species or other wildlife*', discussions with Natural England, as described in ES Chapter 8: Terrestrial Biodiversity, and ES Chapter 9: Marine Biodiversity (Application Document 6.1) as well as the Habitats Regulations Assessment report (Application Document 6.5), have been ongoing throughout the EIA process, including agreement on the locations of noise surveys. The desk-based and field survey requirements which have informed the Habitats Regulations Assessment report were subject to consultation with Natural England via the EIA scoping process and reported within the Scoping Report for the Project.

6.5.295 In accordance with NPSNN paragraph 5.194, the Project demonstrates good design to minimise the noise impacts through the location and alignment of the Project selected to be as far away as is feasible from identified Noise Sensitive Receptors whilst balancing other considerations. Noise impacts have been one of many considerations throughout the design process of the Project with the scheme kept low in the environment and significant levels of earthworks implemented to contain and control noise emissions. The options selection process, route selection and refinement of the Project design are discussed in detail in Chapter 5: Project Evolution and Alternatives in this Planning Statement.

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6.5.296 The Project alignment and embedded design sought to reduce the noise impacts at receptors and within the production of the ES further project modelling was undertaken to enable a prediction of noise levels at individual receptors to inform the development of appropriate mitigation measures during

construction and operation. All false cuttings, embankments and associated landscaping are included within the General Arrangement Drawings (Application Document 2.5) which would be legally secured through Requirement 3 of the draft DCO (Application Document 3.1). The proposed mitigation measures would be provided at the locations detailed in Figure 2.4: Environmental Masterplan (Application Document 6.2) which would be legally secured through Requirement 4 of the draft DCO.

Table 6.5 Proposed earthworks (construction phase)

Location	Mitigation measures	REAC reference
Southern tunnel entrance compound	Earth bunds of approximately 2-3m in height formed from material excavated onsite would be sited along the boundary of the compound, as material becomes available to facilitate visual screening for residential properties on Thong Lane and Rochester Road (A226) during construction. The phasing of the works would be planned so that the bunds are in place before the main compound activities commence, subject to excavated material availability.'	LV008
A226 Gravesend Road compound	Earth bunds of 3m in height would be formed from material excavated and retained on site, as material becomes available to facilitate visual screening for residential properties on Castle Lane, Chalk.	LV011
Northern Tunnel Entrance Compound	The earthworks area (Tilbury Fields landform) in the southern part of the northern tunnel entrance compound will include a 3m high bund (including any temporary barrier or equivalent required) constructed 75m north of the existing field boundary (indicative location shown on HRA Figure 24 (Application Document 6.5)) to delimit the extent of works from the functionally linked land associated with the Thames Estuary and Marshes SPA/Ramsar and avoid disturbance of birds in the passage and winter period. Construction of the 3m high bund will be carried out during April, May, June and July, and the 3m bund (including any temporary barrier or equivalent required) will be functional to mitigate noise and visual disturbance by the end of July, so that completion of the bund does not disturb (as monitored through HR009) the wintering bird qualifying interests. Any earthwork movements required to complete the Tilbury Fields landform south of the bund will only be carried out during April, May, June and July.	HR005
Station Road compound	Where soil is excavated and retained on site temporarily, it would be stockpiled in the form of earth bunds to facilitate visual screening for residential properties along Church Road and Station Road.	LV015
Brentwood Road compound	Where soil is excavated and retained on site temporarily, it would be stockpiled in the form of an earth bund on the southern boundary of the compound to facilitate visual screening for residential properties within Chadwell St Mary where reasonably practicable.	LV017
Mardyke compound	Where soil is excavated and retained on site temporarily, it would be stockpiled in the form of earth bunds to facilitate screening for Hobletts to the north-east.	LV021
M25 compound	It is anticipated that a concrete batching plant would be located within this compound. This facility would be located as south-westerly as reasonably practicable, to maximise distance from the North Ockendon Conservation Area.	LV023

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Location	Mitigation measures	REAC reference
M25 compound	Where soil is excavated and retained on site temporarily, it would be stockpiled as earth bunds on the eastern boundary of the compound to facilitate visual screening for the North Ockendon Conservation Area.	LV024
Ockendon Road compound	Where soil is excavated and retained on site temporarily, it would be stockpiled in the form of earth bunds on the south and west boundaries of the compound, where required to facilitate screening for Ockendon Road and the nearest residential properties at the static caravan park.	LV026

Extract from Table 12.27 of ES Chapter 12

Table 6.6: Embedded earthwork elements – operational

Section	Element	False cutting, embankment or cutting height from road surface levels
A2 to the South Portal	False cutting along M2/A2/A122 Lower Thames Crossing junction slip road	4m above slip roads/visual mitigation
	Tunnel approach cutting	Up to 28m deep
North Portal to the A13	Flood bunding and protection bund to the portal maintenance access road either side of the Project road	7.83m above ordnance datum (AOD) flood bunding with 9m AOD bund for future fill by Ingrebourne Valley Limited (IVL)
	A122 in tunnel approach structure	Up to 12.8m deep
	A122 at Hoford Road in cutting	Up to 8.5m deep
	False cuttings along Chadwell St Mary link both sides of the Project	4m above the A122/noise mitigation
	Muckingford Road slackened slopes to blend landscaping in with green bridge	Up to 7m high
A13 junction	False cutting along junction slip roads	Either 2m or 4m above slip roads/visual or noise mitigation
	A122 in cutting	Between 2m and 5m deep
	Engineered earth slope between A13 slip road and A1013 to soften slope	10m high
A13 to the M25	False cuttings along Ockendon link both sides of the A122 south of the flood zone and along the southbound carriageway between FP136 and The Wilderness	2m above the A122/visual mitigation
	A122 on embankment in flood zone between viaducts	6.2m high
	Retaining walls either side of the Project between the landfill and The Wilderness	5.5m deep
	False cuttings between North Road and the M25	5m above the A122/noise and visual mitigation
	Green Lane slackened slopes to blend landscaping in with green bridge	Up to 12m high
	North Road slackened slopes to blend landscaping in with green bridge	Up to 3m high

Section	Element	False cutting, embankment or cutting height from road surface levels
M25	False cuttings between North Road and the M25	5m above the A122/noise and visual mitigation
	False cutting to slip roads bordering Thames Chase Community Forest with slackened slope for planting	2m above the A122/visual mitigation
	Slip road slackened slope between Ockendon Road and the M25 for agriculture	13.5m in height above the A122 and 10m above the M25 at its highest point

Extract from Table 12.28 of ES Chapter 12

6.5.297 In considering the requirements contained within NPSNN paragraph 5.195, which states:

> 'The Secretary of State should not grant development consent unless satisfied that the proposals will meet, the following aims, within the context of Government policy on sustainable development:
>
> - avoid significant adverse impacts on health and quality of life from noise as a result of the new development;
> - mitigate and minimise other adverse impacts on health and quality of life from noise from the new development; and
> - contribute to improvements to health and quality of life through the effective management and control of noise, where possible.'

6.5.298 A summary of construction impacts is presented in Table 12.60 of ES Chapter 12: Noise and Vibration (Application Document 6.1)). The assessment includes the provision of mitigation measures set out with in Section 12.5 of ES Chapter 12. Significant effects have been identified as a result of construction road traffic noise and diversion route impacts, percussive piling vibration impacts, and vibratory piling vibration impacts. However construction noise and vibration would be mitigated using best practice measures set out in the CoCP (Appendix 2.2, Application Document 6.3).

6.5.299 All piling activities associated with the Project would be limited to daytime operations only. However, significant impacts are likely to occur and further specific mitigation and control measures would be necessary (secured through REAC reference NV017). Subject to these measures being implemented, impacts would be mitigated and controlled.

6.5.300 Ground-borne noise and vibration impacts associated with TBM and micro-TBM activities during construction have been shown to be negligible (Tables 12.45 and 12.46 of ES Chapter 12: Noise and Vibration (Application Document 6.1)).

Table 6.7 Summary assessment of accordance with the aims of NPSNN paragraph 5.195 for construction

NPSNN 5.195	Policy text	Project response
Aim 1	Avoid significant adverse impacts on health and quality of life from noise as a result of the new development	The Project has sought to avoid significant adverse impacts on health and quality of life at noise-sensitive receptors. These have been avoided where practicable through a detailed scheme of mitigation and key design considerations. These measures have included keeping the Project low in the environment, placing the main alignment in a position to optimise separation distances, and substantial groundworks (bunds, false cuttings and cuttings) low noise surfacing and acoustic fencing provision. The mitigation strategy for the operational phase has been secured through controls inherent within the REAC, specifically NV011, NV013 and NV014. The avoidance of significant adverse impacts on health and quality of life was difficult to achieve at some locations when mitigation measures are considered against engineering constraints, other environmental topics and the principles of Government policy on sustainable development. Although mitigation has been implemented as part of the Project design, significant adverse impacts on health and quality of life would remain at noise-sensitive receptors where significant effects above a Significant Observed Adverse Effect Level (SOAEL) are predicted to occur (ES Chapter 12: Noise and Vibration). Therefore, based upon the reasons quoted and within the context of Government policy on sustainable development the Project is considered to be in accordance with the requirements of Aim 1.
Aim 2	Mitigate and minimise other adverse impacts on health and quality of life from noise from the new development	Through the mitigation proposed (secured through the REAC, specifically NV011, NV013 and NV014), and in achieving the requirements of Aim 1 to avoid significant adverse impacts above a SOAEL, the design also minimises adverse impacts of the Project occurring between Lowest Observed Adverse Effect Level (LOAEL) and a SOAEL along the alignment within the context of Government policy on sustainable development, and so by proxy achieves the requirements of Aim 2. On this basis, it is concluded that the second aim is met during operation.
Aim 3	Contribute to improvements to health and quality of life through the effective management and control of noise, where possible	Through the implementation of the Project, road traffic noise at receptors near the bypassed existing road network would be reduced and, therefore, presents both significant beneficial effects above a SOAEL, and beneficial effects between LOAEL and a SOAEL (ES Chapter 12: Noise and Vibration); and therefore, presents significant beneficial impacts on health and quality of life. With the Project, there are predicted to be more receptors below a SOAEL than without the Project.

Extract from ES Chapter 12: Noise and Vibration

6.5.301 Notwithstanding the various mitigation measures described above, the ES Chapter 12: Noise and Vibration, (Application Document 6.1) predicts:

a. temporary moderate to major adverse effects for 460 noise/other sensitive receptors, varying over the six-year construction period, as a result of road traffic noise impacts

b. temporary adverse effects for 391 noise/other sensitive receptors as a result of construction diversion route noise impacts varying over the six-year construction period

c. temporary moderate or greater adverse effects for up to 15 vibration sensitive receptors adjacent to retaining wall structures as a result of percussive piling activities, reducing to three vibration sensitive receptors should vibratory piling techniques be possible.

6.5.302 However, the Applicant considered that given the temporary nature of the construction activities associated with the Project and having regard also to the NPSE (paragraph 2.18) which acknowledges the need to integrate consideration of the economic and social benefits of the Project, the overriding need for the Project as detailed in the Need for the Project (Application Document 7.1) and the nature of the impacts identified would not conflict with the provisions within the NPSNN or wider government policy. Furthermore, the Noise Policy Statement for England, in paragraph 2.25 acknowledges that improvements to health and quality of life will be achieved '*where possible*' and '*while taking into account the guiding principles of sustainable development*'.

6.5.303 With regards to operational impacts, both adverse and beneficial impacts have been identified, with many of the beneficial impacts being associated with the M25 between M25 junction 28 and the Dartford Crossing, and along the A2. Notwithstanding the measures incorporated within the Project design, significant adverse effects are predicted at 1,439 noise-sensitive receptors. These impacts need to be balanced against the identified significant beneficial effects for 1,367 noise-sensitive receptors, predominantly along bypassed routes (located in the following areas M25: between A122 Northern junction with M25 and M25 junction 31; A282 Dartford Crossing: between M25 junction 31 and M25 junction 2; A2: between M25 junction 2 and A122 southern junction; and A13: west of A122 to M25 Junction 30).

6.5.304 During the course of the Examination hearings a noise issue has arisen in respect of the Whitecroft Care Home in terms of the potential impact of construction of the Project on residents of the care home which provides end-of-life dementia support. There has been ongoing negotiation between the Applicant and the owners/operators of the care home which has resulted in the Applicant making provision to purchase the care home which will allow the residents to be relocated to a replacement facility and so remove the potential noise issue.

Table 6.8 Summary assessment of accordance with the aims of NPSNN paragraph 5.195 for operation

NPSNN 5.195	Policy text	Project response
Aim 1	Avoid significant adverse impacts on health and quality of life from noise as a result of the new development	The Project has sought to avoid significant adverse impacts occurring above a SOAEL at noise-sensitive receptors. This has been carried out where possible through key considerations including keeping the Project low in the environment, placing the main alignment where possible in a position to optimise separation distances, and through a detailed scheme of mitigation. A detailed mitigation strategy for the operational phase is secured through controls inherent within the REAC, specifically NV011, NV013 and NV014. Even though mitigation has been implemented as part of the Project, significant effects above a SOAEL have not been completely avoided and within the Project, there remain receptors where significant effects above a SOAEL are predicted (ES Chapter 12: Noise and Vibration). However, due to the scale and nature of the Project, avoiding all significant adverse effects was not possible when considering the principles of sustainable development. Therefore, based upon the reasons quoted and within the context of Government policy on sustainable development the Project is considered to be in accordance with the requirements of Aim 1.
Aim 2	Mitigate and minimise other adverse impacts on health and quality of life from noise from the new development	Within the design of the Project, substantial amounts of groundworks, including bunds, false cuttings and cuttings are combined with specific acoustic mitigation in the form of Thin Surfacing System and acoustic fencing provision. This was designed in association with other environmental topics and considering engineering factors to avoid new significant impacts and ensure buildability. These measures were designed and implemented to reduce the environmental impact of the Project along the length of the alignment. Therefore, through the mitigation proposed (secured through the REAC, specifically NV011, NV013 and NV014), and in achieving the requirements of Aim 1 to avoid significant adverse impacts above a SOAEL, the design also minimises adverse impacts of the Project occurring between LOAEL and a SOAEL along the alignment, and so by proxy achieves the requirements of Aim 2. On this basis, it is concluded that the second aim is met during operation.
Aim 3	Contribute to improvements to health and quality of life through the effective management and control of noise, where possible	Through the implementation of the Project, road traffic noise at receptors near the bypassed existing road network would be reduced and, therefore, presents both significant beneficial effects above a SOAEL, and beneficial effects between LOAEL and a SOAEL (ES Chapter 12: Noise and Vibration); and therefore, presents significant beneficial and beneficial effects on health and quality of life.

Extract from ES Chapter 12: Noise and Vibration

6.5.305 Operational static plant noise associated with the tunnel ventilation buildings at the North and South Portals will be mitigated through design and equipment specification to comply with the noise levels specified in the REAC (Reference NV014). As a result, the noise emitted from operational fixed plant accords with the requirements of NPSNN paragraph 5.195.

6.5.306 The Project will accord with the requirements set out within NPSNN paragraphs 5.197 and 5.198 through the implementation of the various mitigation measures referred to above. Those specific to construction are contained within the CoCP (Application Document 6.3) which, in turn is secured through Requirement 4 of Part 1 of Schedule 2 of the draft DCO (Application Document 3.1), whilst those specific to the operational phase are included within the Design Principles (Application Document 7.5), secured through Requirement 3 of the draft DCO, or as features presented on Figure 2.4: Environmental Masterplan (Application Document 6.2) secured through Requirement 4 of the draft DCO.

6.5.307 In recognising the requirements of NPSNN paragraph 5.199, a Noise Insulation Regulations Assessment (ES Appendix 12.7 (Application Document 6.3)) has been undertaken. The results of this assessment are reported in Section 3 of ES Appendix 12.7 and indicate that no dwellings would indicate eligibility for noise insulation under the Noise Insulation Regulations 1975.

6.5.308 With regards to Noise Important Areas (NIAs) and the requirements of NPSNN paragraph 5.200, paragraph 12.6.199 of ES Chapter 12: Noise and Vibration (Application Document 6.1) concludes that none of the identified NIAs within the study area that are within the Order Limits are demonstrated to result in an adverse change in road traffic noise, this is primarily due to the implementation of low noise surfacing. The identified NIAs within the study area that are outside of the Order Limits are shown to, at worst, result in minor adverse changes in road traffic noise resulting from changes in traffic flow patterns as a result of the Project.

Conclusion

6.5.309 In accordance with the provisions within NPSNN, through design, the Project has sought to avoid significant adverse noise impacts on sensitive receptors within the study area, which represent the closest and potentially worst-affected receptors to the operational Project. Where noise issues have been identified solutions have been proposed to mitigate those impacts. It can, therefore, be concluded that, through implementing the identified mitigation, the Project would meet the aims of the NPSNN and the Energy NPSs, defined within the context of Government policy on sustainable development.

Impacts on transport networks

Introduction

6.5.310 The road network across the south-east of England carries a high volume of traffic on a daily basis and is coming under increasing pressure due to economic growth across the region. As a result, there are a number of areas of significant existing congestion across the road network, one of which is the Dartford Crossing and its approach roads. One of the objectives of the Project is to help relieve this area of congestion by providing an alternative river crossing route to the Dartford Crossing. In doing so, traffic flows across the

region would change, which would result in some improvements and some worsening in other areas of congestion across the region. Overall, the impact of the Project on transport networks is considered to be positive due to the wide-ranging benefits which would accrue (see the Need for the Project, Application Document 7.1).

Policy and Compliance

6.5.311 Paragraph 4.6 of the NPSNN requires applications for road projects to be supported by a local transport model to provide *'sufficiently accurate detail of the impacts of a project'*.

6.5.312 A Transport Assessment (TA) (Application Document 7.9) has been undertaken based on the outputs from the Lower Thames Area Model (see below for further commentary on the TA).

6.5.313 Paragraphs 5.203 – 5.205 of the NPSNN require that applicants should have regard for policies set out in local plans, should consult the relevant highway authority and local planning authority, as appropriate, on the assessment of transport impacts. Applicants should consider '*reasonable opportunities to support other transport modes in developing infrastructure.'* As part of this*, 'the applicant should provide evidence that as part of the project they have used reasonable endeavours to address any existing severance issues that act as a barrier to non-motorised users'*.

6.5.314 A full assessment of compliance of the Project with the local planning policy framework is set out in Chapter 7 (Other matter of potential relevance and importance) and Appendix C of this Planning Statement, while Volume 5 of the Consultation Report (Application Document 5.1) as well as the Statement of Engagement (Application Document 5.2) provide details of engagement that has taken place.

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6.5.315 Severance is addressed earlier in this Chapter under the heading 'Sustainable Transport' in response to paragraph 3.17 of the NPSNN.

6.5.316 Paragraph 5.206 of the NPSNN requires development that is subject to an EIA and likely to have significant impacts on transport networks to address those impacts and any mitigation proposed in the ES.

6.5.317 An EIA was carried out for the Project, which identifies and assesses the impacts arising from the Project and the proposed mitigation measures, including those arising from impacts from changes in the traffic networks, the results of which are reported in the ES (Application Document 6.1).

6.5.318 Paragraph 5.208 of the NPSNN (paragraph 5.13.4 of the NPS EN-1) requires applicants to produce a travel plan to demonstrate how management measures to mitigate transport impacts and improve access to public transport and sustainable modes of travel have been addressed.

6.5.319 The Framework Construction Travel Plan (Application Document 7.13) sets out a framework to minimise the impact of the Project's construction workforce on the road network as a result of travel to and from the Project construction areas and compounds. The overarching aims of the Plan are also set out in the CoCP (Application Document 6.3) and are secured through Requirements 10 and 11 of Part 1 to Schedule 2 of the DCO (Application Document 3.1).

6.5.320 Paragraph 5.209 of the NPSNN requires applicants to have regard to DfT Circular 02/2013 The SRN and the delivery of sustainable development. This Circular sets out the way in which National Highways will engage with communities and the development industry to deliver sustainable development and economic growth whilst also safeguarding the primary function and purpose of the strategic road network. See the Need for the Project (Application Document 7.1), Consultation Report (Application Document 5.1) and the Statement of Engagement (Application Document 5.2).

6.5.321 With regard to paragraph 5.210 of the NPSNN, see the wider network impacts section below.

6.5.322 Paragraph 5.211 of the NPSNN requires the Examining Authority and SoS to give due consideration to impacts on local transport networks and policies set out in local plans. This is addressed in Chapter 7 (Other matters of potential relevance and importance) and Appendix C (Local Authority Policy Review Table) of this Planning Statement.

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6.5.323 Paragraph 5.212 of the NPSNN requires that schemes should be developed and options considered in the light of relevant local policies and local plans. See Chapter 5 of this Planning Statement for detail on the Project's evolution and alternatives considered.

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Transport Assessment

6.5.324 As noted above, a TA has been prepared. The TA (Application Document 7.9) sets out an assessment of the transport impacts on the strategic and local road network as a result of the Project.

6.5.325 The TA was developed in accordance with the wide range of relevant guidance produced by the Department for Transport (DfT), the Ministry for Housing, Communities and Local Government (MHCLG), National Highways and Transport for London (paragraph 1.3.2 of the TA, Application Document 7.9).

6.5.326 In addition to highway network impacts, the TA (Application Document 7.9) has sought to identify and address the needs of users of public transport and walkers, cyclists and horse riders (WCH). Indeed, the Project design incorporates provision of new routes for WCH, designed to improve access to the existing network, maximise access for users (including those with limited mobility) whilst considering and mitigating potential impacts from misuse and antisocial behaviour through good design. New and improved routes for WCH are described in Part E of the Project Design Report (Application Document 7.4) and shown on Figure 13.4 (Application Document 6.2) ES Chapter 13: Population and Human Health (Application Document 6.1).

Supporting Assessments and Management Plans

6.5.327 The outline Traffic Management Plan for Construction (Application Document 7.14) (oTMPfC) has been produced to provide outline concepts and principles that would be applied for the design, management and communication of construction traffic management and transport logistics for the Project. The oTMPfC provides the framework for the future production by appointed contractors of construction traffic management plans for individual works sites. The oTMPfC will be secured through Requirement 10 of the draft DCO (Application Document 3.1).

6.5.328 The Framework Construction Travel Plan (Application Document 7.13) sets out a framework for the implementation of travel planning for the movement of personnel to and from work sites. It would, like the oTMPfC, guide the production of individual site Traffic Management Plans produced by contractors prior to the commencement of works on individual works sites. The requirements of the Plan will be secured through Requirement 11 of Part 1 of Schedule 2 of the draft DCO (Application Document 3.1).

6.5.329 The outline Materials Handling Plan (Application Document 6.3, Annex B) sets out the approach and principles for handling construction materials and waste on the Project that would shape the Materials Handling Plans produced by Contractors secured via Schedule 2 Requirements of the draft DCO (Application Document 3.1).

Wider network impacts

6.5.330 In demonstrating compliance with paragraph 5.206 of the NPSNN, the TA (Application Document 7.9) identifies that there would be changes to the road network on roads away from the Project alignment in both the construction and operational phases of the Project and that some of these changes would occur as a result of the Project, but others would be as a result of new developments and/or other changes in behaviour on the transport network.

6.5.331 The Wider Network Impacts Management and Monitoring Plan (WNIMMP) (Application Document 7.12) presents the approach proposed to monitoring the traffic impacts of the Project on the wider road network once the Project is operational, and the provision of this data to the relevant highway authority(s) in the context set by paragraph 5.210 of the NPSNN. This WNIMMP sets out how this traffic impact monitoring scheme would be implemented (to be approved by the SoS and implemented by National Highways) pursuant to Requirement 14 in Schedule 2 to the draft DCO (Application Document 3.1). It allows the local highway authorities to understand the potential impacts of the Project and ways in which they can bid for support as part of existing and future funding streams for local road network improvements and upgrades.

6.5.332 In response to the Examining Authority's consideration of wider network impacts at the examination hearings, specifically ExA Actions Points 3, 5 & 6 arising from Issue Specific Hearing 10, the Applicant's Deadline 6 submission 9.134 Wider Network Impacts Position Paper [**REP6-092**] supplements the WNIMMP in respect of potential wider network impacts at four specified locations raised by Interested Parties. These locations being the Blue Bell Hill corridor, the A13 corridor, the A2/M2 corridor and the Asda roundabout.

6.5.333 Paragraphs 5.215 to 5.217 of the NPSNN deal with mitigation for national networks schemes which should be *'proportionate, reasonable and focussed on promoting sustainable transport'* and, should seek to mitigate impacts on accessibility for non-motorised users. For road and rail developments, '*mitigation measures may relate to the design, layout or operation of the scheme'.*

6.5.334 In this case, mitigation has been embedded into the design and planning for the Project from the outset and through its evolution to this DCO stage. This is detailed in the following documents:

a. ES Chapter 3: Assessment of Reasonable Alternatives (Application Document 6.1) (also summarised at Chapter 5 of this Planning Statement)

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b. Wider Network Impacts Management and Monitoring Plan (Application Document 7.12)

c. Project Design Report (Application Document 7.4)

d. Design Principles (Application Document 7.5)

e. Consultation Report (Application Document 5.1)

6.5.335 In terms of construction impacts, mitigation is provided through the measures proposed through the various documents listed below, measures which are secured through requirements contained in the draft DCO (Application Document 3.1).

a. Construction Logistics Plan (to be prepared)

b. Construction Traffic Management Plan (to be prepared)

c. Outline Traffic Management Plan for Construction (Application Document 7.14)

d. Framework Construction Travel Plan (Application Document 7.13)

Conclusion

6.5.336 Overall, while there would be some additional localised traffic impacts on the wider network once the Project is operational, the net benefits to the safe and efficient operation of the network as a whole are considered to outweigh these localised impacts.

6.5.337 Taken together, the TA (Application Document 7.9) and suite of supporting documents described above show that the Applicant has taken a reasonable, proportionate yet comprehensive approach to identifying, addressing and mitigating impacts on transport networks so demonstrating accordance with paragraphs 4.6, 5.206, 5.208, 5.215 and 5.216 of the NPSNN and equivalent requirements of the NPS EN-1 in respect of the energy NSIP aspects of the Project.

Water quality and resources

6.5.338 The NPSNN recognises that infrastructure development can have a multiplicity of effects on the water environment which can have knock-on effects on protected species and habitats, biodiversity and human health through modifications to the water environment, discharges and pollution (paragraph 5.219 of the NPSNN, also at paragraph 5.15.1 of NPS EN-1 and 5.16.1 of the draft NPS EN-1).

6.5.339 Paragraph 5.220 of the NPSNN requires the planning system to '*contribute to and enhance the natural and local environment by, amongst other things, preventing both new and existing development from contributing to, or being put at unacceptable risk from, or being adversely affected by, water pollution*.'

6.5.340 The surface water bodies located within the Project's Zone of Influence are presented in Drawing 2, Annex C of ES Appendix 14.7: Water Framework Directive Assessment (Application Document 6.3). ES Appendix 14.7 reports the staged assessment to determine whether any elements of Project construction or operation would cause deterioration of the status of surface, transitional and groundwater bodies, and the protected areas they support. Project construction and operational activities have been assessed for effects on biological quality, hydromorphology and physico-chemical quality/specific pollutants. Overall, it is concluded that none of the activities associated with the Project would prevent or undermine future actions to bring water bodies to good status.

6.5.341 Applicants are advised to make early contact with the Environment Agency, water companies (paragraph 5.221 of the NPSNN) and others to carry out an assessment of the impacts of the proposed project on water resources and water quality as part of the ES. Paragraph 5.223 of the NPSNN (also broadly replicated at paragraph 5.15.3 of the NPS EN-1 and 5.16.5 of the draft NPS EN-1) sets out the matters any ES should describe with regard to water quality and resources.

6.5.342 As set out in Table 14.1 of ES Chapter 14 (Application Document 6.1), early engagement has been undertaken with the Environment Agency on a range of issues, including the water features survey, hydrogeological monitoring, WFD assessment, surface water discharge, dewatering and contaminated land along with consent requirements. Consultation has also been undertaken with the water supply companies, LLFAs along with Natural England and the North Kent Marshes Internal Drainage Board. Accompanied site visits with the Environment Agency have also been undertaken as part of the engagement process.

6.5.343 Paragraph 5.225 of the NPSNN requires the SoS to give water quality impacts greater weight where the Project would have adverse effects to the achievement of Water Framework Directive objectives and to be satisfied that due regard has been had to any relevant River Basin Management Plans (paragraph 5.226 of the NPSNN).

6.5.344 ES Appendix 14.4: Hydromorphology Assessment (Application Document 6.3) concludes that the Project would not cause deterioration, at the water body scale, of the hydromorphology supporting element of the Water Framework Directive (WFD) status of the watercourses assessed, nor compromise attainment of future WFD objectives for these waterbodies.

6.5.345 Paragraph 5.227 of the NPSNN requires the decision-maker to ensure that any mitigation proposals (paragraphs 5.228 to 5.231 of the NPSNN) put forward are effective and to take into account any outstanding concerns of the Environment Agency. Paragraph 5.230 specifically refers to the use of SuDS and paragraph 5.231 to good project design and pollution control practices helping mitigate any potential adverse impacts.

6.5.346 In order to address these requirements of the NPSNN, the following studies have been undertaken related to the impacts of the Project on the water environment:

a. A Water Features Survey (ES Appendix 14.2, Application Document 6.3) which provides a factual record of baseline surface and groundwater characteristics

b. An Operational Surface Water Drainage Pollution Risk Assessment (ES Appendix 14.3, Application Document 6.3) which assesses the risk of pollution from the Project to surface water bodies due to routine discharge of highway runoff

c. A Hydromorphology Assessment (ES Appendix 14.4, Application Document 6.3) has assessed the potential for likely significant effects on the hydromorphology of watercourses within the Order Limits and up to 1km up and downstream during the construction and operational phases of the Project

d. Hydrogeological Risk Assessment (ES Appendix 14.5, Application Document 6.3) assesses the impacts of the Project on groundwater quality, groundwater resources, levels and flows

e. Part 7 of the FRA (ES Appendix 14.6, Application Document 6.3) establishes a strategy for managing operational surface water drainage centred on the application of SuDS, appropriate to local conditions

f. A Stage 4 Water Framework Directive Assessment (ES Appendix 14.7, Application Document 6.3) has been prepared which comprises an appraisal of those aspects of the Project which are considered likely to cause detriment to the current status, objectives or measures set for those water bodies in the Project's defined Zone of Influence (ZoI)

g. Section 14.5 in ES Chapter 14: Road Drainage and the Water Environment (Application Document 6.1) describes the construction and operational mitigation proposed for the Project

6.5.347 The Hydrogeological Risk Assessment (ES Appendix 14.5 (Application Document 6.3)) summarises the significance of all residual impacts identified as 'Not Significant' and shows the mitigation measures proposed and where these will be secured through the REAC which forms part of the CoCP (Application Document 6.3) secured through Requirement 4 in Schedule 2 of the draft DCO (Application Document 3.1).

6.5.348 ES Appendix 14.7: WFD Assessment (Application Document 6.3) has concluded, taking into account measures embedded in the Project design, in combination with commitments to methods of construction and compound management which are documented in the CoCP (Application Document 6.3, Appendix 2.2) which would prevent or mitigate potential effects on surface, transitional or groundwater bodies (paragraph 8.1.2), that there would be no deterioration of biological quality, hydromorphology, physico-chemical or specific pollutant supporting elements at the surface water body scale, at which WFD compliance is judged. In addition, the Project would not prevent the future attainment of the WFD objectives for each of the respective water bodies, nor pose barriers to implementing future measures described in the River Basin Management Plans to achieve these objectives (paragraph 8.1.4).

6.5.349 The WFD Assessment (ES Appendix 14.7, Application Document 6.3) has concluded that the Project would result in no detriment to any European designated site or regional or local wildlife designation within the ZoI (paragraph 8.1.11). Paragraph 8.1.12 concludes that none of the activities associated with the Project would prevent or undermine future actions to bring water bodies to 'good' status and no instances have been identified where a Regulation 19[1] derogation is required.

6.5.350 The overall conclusion of ES Chapter 14: Road Drainage and Water Environment (Application Document 6.1), taking into account the Project design and mitigation set out in Section 14.5 is that there would be no likely significant adverse effects on water environment receptors.

6.5.351 Accordingly, the Applicant has demonstrated that the Project accords with the relevant requirements of the NPSNN/NPS EN-1 (and in so far as it is relevant to this Project, the draft NPS EN-1) in respect of water quality and resources.

6.6 Energy Policy and additional Energy NPS (and draft, revised draft and final published Energy NPS) requirements

Introduction

6.6.1 As noted in Chapter 3 Project Description of the Planning Statement, the delivery of the Project involves the new route and associated approach roads necessitates the diversion of a number of existing underground gas pipelines and overhead electricity power lines. Four of these diversions are of sufficient scale that they qualify as NSIPs in their own right. There are three proposed gas pipeline diversions located to the south of the River Thames (Work Nos. G2, G3 and G4) and one OHL diversion (Work No. OH7) to the north of the River Thames which meet the NSIP criteria. As NSIPs in their own right, these four elements of the Project fall to be assessed against the Energy NPSs.

6.6.2 The approach taken to the assessment of impacts of a project in the Energy NPSs closely follows that taken in respect of the NPSNN. Broadly the same assessment principles apply in the Energy NPSs as in the NPSNN as do the requirements for Environmental Impact and Habitats Regulations Assessment. and broadly the same generic impacts apply. These have been addressed in the preceding sections of this chapter.

Additional Energy NPS assessment principles

6.6.3 There are no specific requirements in respect of land stability contained within the NPS EN-1 or draft NPS EN-1. However, in respect of gas and oil pipelines, section 2.23 of NPS EN-4 (and subsequent revisions to the NPS, in so far as they may be relevant to this Project) identifies the potential risks underground cavities and unstable ground conditions may raise for pipeline projects. Paragraphs 2.23.5 and 2.23.6 of the NPS EN-4 require decision-makers to be

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[1] Regulation 19 of the of Water Environment (Water Framework Directive) (England and Wales Regulations 2017 (WFD Regulations), as amended by the Floods and Water (Amendment etc.) sets out the conditions for derogation in the event of new modifications to the physical characteristics of a body of surface water, alterations to the level of bodies of groundwater or new sustainable human development activities.

satisfied that applicants have considered underground sub-terranean matters which might have an effect on the integrity and safety of pipelines and ensure that appropriate mitigation measures are put in place where these might be required. The Applicant has carried out extensive geotechnical assessments of the ground conditions for the diverted gas pipelines in line with DMRB CD 622 Managing Geotechnical Risk (Highways England 2020a). ES Appendix 10.2: The Stability Report (Application Document 6.3)) confirms that there are no significant risks identified.

6.6.4 The detailed assessment carried out and reported in ES Chapter 10: Soils and Geology (Application Document 6.1) along with the control measures identified the REAC/CoCP (Application Document 6.3) and secured through Schedule 2, Part 1 of the draft DCO demonstrate that the Project has complied with the policy requirements and accordingly, it is considered that the SoS can be satisfied that the Project accords with the relevant requirements of the NPS EN-4 (and, in so far as it is relevant to the consideration of this Project, the draft NPS EN-4).

6.6.5 A number of additional assessment principles to those presented in Section 6.4 NPS assessment principles of this Planning Statement are identified in NPS EN-1 in respect of energy infrastructure projects which are not addressed in the NPSNN. These are as follows:

a. Section 4.6 Consideration of Combined Heat and Power (CHP)

b. Section 4.7 Carbon Capture and Storage (CCS) and Carbon Capture Readiness (CCR)

c. Section 4.9 Grid Connection

d. Section 4.12 Hazardous Substances

e. The November 2023 published version of NPS EN-1 also introduces a new "Critical National Priority" (CNP) for low carbon infrastructure at section 4.2

Combined heat and power, carbon capture and carbon capture readiness

6.6.6 Sections 4.6 and 4.7 (CHP, CCS and CCR) of NPS EN-1 and section 4.2 of the November 2023 version of NPS EN-1 are not relevant to the energy infrastructure aspects of the Project as the Project does not involve any CHP, CCS or CCR proposals. Furthermore, the energy NSIP elements of the Project are ancillary to the main Project and not critical national infrastructure priorities for low carbon infrastructure. However, Sections 4.9 and 4.12 of NPS EN-1 are potentially relevant and are addressed below.

Grid connections

6.6.7 In accordance with the requirements of Section 4.9 of the NPS EN-1 (paragraph 4.9.1 in particular) (now referred to as "Network Connection" in the November 2023 NPS EN-1) the Applicant has undertaken extensive engagement with the UK Power Networks as evidenced in the Consultation Report (Application Document 5.1). The Applicant has submitted a signed Statement of Common Ground with UK Power Networks with this application (Application Document 5.4).

Hazardous Substances

6.6.8 In terms of section 4.12 of the NPS EN-1 (now section 4.14 of the November 2023 NPS EN-1) this refers to the procedures to be followed where an Applicant wishes to hold stocks of hazardous substances above certain thresholds, the need to consult the Health and Safety Executive (HSE) and local planning authorities and the steps the IPC will take to determine the DCO alongside the HSE advice.

6.6.9 This has now been superseded by the Control of Substances Hazardous to Health (COSHH) legislation updated on 17 January 2020 which is administered by the HSE.

6.6.10 The Applicant does not propose the storage of hazardous substances above de minimis levels but, in any event, there has been extensive engagement with the HSE during the formulation and evolution of the Application proposals as evident in the Consultation Report (Application Document 5.1). The Applicant has submitted a draft Statement of Common Ground with the HSE with this DCO Application (Application Document 5.4).

6.6.11 The November 2023 version of NPS EN-1 also introduces two new matters not contained in the designated NPS EN-1 which deal with the issues of 'environmental and biodiversity net gain' (section 4.6) and 'marine considerations' (section 4.5).

6.6.12 Marine plans are considered further in Chapter 7 of this Planning Statement. In summary, while the relevant marine plan has been considered during the formulation of the draft DCO and the MMO has been engaged in its preparation, ultimately it is not considered directly relevant to the determination of this draft DCO.

6.6.13 In terms of biodiversity net gain (BNG), paragraph 4.6.2 of the November 2023 NPS EN-1 identifies that, even though achieving BNG is not mandatory for NSIP projects, applicants should take opportunities to enhance the natural environment wherever possible.

6.6.14 Paragraph 4.6.1 of the November 2023 NPS EN-1 goes on to note that:

> 'Although achieving biodiversity net gain is not currently an obligation on applicants, Schedule 15 of the Environment Act 2021 contains provisions which, when commenced, mean the Secretary of State may not grant an application for Development Consent Order unless satisfied that a biodiversity gain objective is met in relation to the development to which the application relates.'

6.6.15 Insofar as it is relevant to the energy NSIP aspects of this Project, which comprises the replacement of existing energy transmission / distribution infrastructure rather than introducing wholly new infrastructure in its own right, the issue of environmental and biodiversity net gain is addressed in the biodiversity 'generic impacts' section of this chapter below.

Additional energy NPS generic impacts

6.6.16 In terms of differences between the NPS EN-1 and the NPSNN there is one additional 'generic impact' which is unique to the former and so is not addressed in Section 6.6.

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Electric and magnetic fields

6.6.17 That matter relates to electric and magnetic fields (EMFs) arising from the transmission and distribution of electricity via power lines and electric cables. This matter is addressed in section 2.10 of the NPS EN-5 (and paragraphs 2.9.44 to 2.9.58 of the November 2023 NPS EN-5). Specifically, this is a potential effect of the proposed rerouting of overhead power line OH7. Paragraphs 2.10.1 to 2.10.8 of NPS EN-5 set out the background to the scientific research into the potential health issues associated with EMFs and the various guidelines and standards which have been developed over the years to minimise these impacts.

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6.6.18 In order to demonstrate accordance with the matters raised in paragraphs 2.10.9 to 2.10.15 of NPS EN-5 (2.10.11 to 2.13.13 of the November 2023 NPS EN-5) Appendix D to Application Document 7.10 (Health and Equalities Impact Assessment) comprises a 'National Grid Electric and Magnetic Field Report'. This report sets out to provide an assessment of the likely significant environmental effects of EMFs associated with the modification of existing electricity infrastructure necessary to accommodate the Project.

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6.6.19 The overall conclusion of the report set out at paragraph 7.1.1 is that:

> 'The modifications to existing overhead lines necessary to accommodate the Project are fully compliant with the current public exposure guidelines for EMFs documented in NPS EN-5. Therefore, there will be no significant EMF effects resulting from these proposed modifications.'

Landscape and visual impacts

6.6.20 The energy NSIP aspects of the Project, in particular the proposed relocation of overhead cable OH7 at the junction with the A13 / A1089 and over the Ockendon Link (Plate 3.3), is to be considered against the provisions of NPS EN-5 which introduces some specific considerations which apply to new pylons and overhead cables not referenced in the NPSNN.

6.6.21 Paragraph 2.2.2 of NPS EN-5 (and the November 2023 NPS EN-5) notes that the general location of electricity network projects is often determined by the location, or anticipated location, of a particular generating station.

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6.6.22 The NPS EN-5 acknowledges at paragraph 2.8.2 that new pylons can give rise to adverse landscape and visual impacts depending on their scale, location, routeing etc. However, it also notes that these impacts can usually be mitigated, other than potentially in particularly sensitive locations where the adverse impacts of an overhead line may make it unacceptable in planning terms.

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6.6.23 Paragraph 2.8.4 of NPS EN-5 notes that:

> '…wherever the nature or proposed route of an overhead line proposal makes it likely that its visual impact will be particularly significant, the applicant should have given appropriate consideration to the potential costs and benefits of other feasible means of connection or reinforcement, including underground and sub-sea cables where appropriate.'

6.6.24 Similar text is contained at paragraph 2.9.14 of the November 2023 NPS EN-5.

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6.6.25 Paragraphs 2.8.5 and 2.8.6 of the NPS EN-5 (2.9.17 of the November 2023 NPS EN-5) summarise the requirements of the 'Holford Rules' (see below) which the IPC is required to follow in making decisions over the routeing of new overhead lines (paragraph 2.8.7). Paragraph 2.8.6 outline that the Holford Rules state that developers should:

a. 'avoid altogether, if possible, the major areas of highest amenity value, by so planning the general route of the line in the first place, even if total mileage is somewhat increased in consequence;

b. avoid smaller areas of high amenity value or scientific interest by deviation, provided this can be done without using too many angle towers, i.e. the bigger structures which are used when lines change direction;

c. other things being equal, choose the most direct line, with no sharp changes of direction and thus with fewer angle towers;

d. choose tree and hill backgrounds in preference to sky backgrounds wherever possible. When a line has to cross a ridge, secure this opaque background as long as possible, cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees;

e. prefer moderately open valleys with woods where the apparent height of towers will be reduced, and views of the line will be broken by trees;

f. where country is flat and sparsely planted, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, so as to avoid a concentration of lines or "wirescape"; and

g. approach urban areas through industrial zones, where they exist; and when pleasant residential and recreational land intervenes between the approach line and the substation, carefully assess the comparative costs of undergrounding.'

6.6.26 Paragraphs 2.8.8 and 2.8.9 of the NPS EN-5 (2.9.20 to 2.9.25 of the November 2023 NPS EN-5) address the specific considerations regarding the undergrounding of cables which includes the significant additional cost of undergrounding (including the higher ongoing inspection, maintenance and repair costs) versus the benefits.

6.6.27 Paragraph 5.9.18 of the NPS EN-1 (5.10.13 of the November 2023 NPS EN-1) states that all proposed energy infrastructure is likely to have visual effects for many receptors around proposed sites. The NPS goes on to say at paragraph 5.9.19 (5.10.25 of the November 2023 NPS EN-1 and 5.10.24 of the draft NPS EN-1):

6.6.28 'It may be helpful for applicants to draw attention, in the supporting evidence to their applications, to any examples of existing permitted infrastructure they are aware of with a similar magnitude of impact on sensitive receptors. This may assist the IPC in judging the weight it should give to the assessed visual impact of the proposed development.'

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6.6.29 ES Chapter 7: Landscape and Visual (Application Document 6.1) states that 'diverted stretches of overhead powerlines would not appear notably different to the existing alignments. There would be a small number of additional and/or larger pylons in some locations but these would be viewed in the context of existing pylons'.

6.6.30 Turning to the landscape and visual impacts of the Energy NSIP aspects of the Project, in particular the proposed rerouting of OH7, the Holford Rules (paragraph 2.8.6 of the NPS EN-5 and 2.9.17 of the November 2023 NPS EN-5) specify the measures developers should adopt to avoid, minimise and mitigate the impacts of new OHLs.

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6.6.31 The Applicant has considered the above Holford Rules when determining the appropriate route option for OH7 (see Section 3.28 of ES Chapter 3: Assessment of Reasonable Alternatives (Application Document 6.1) and Chapter 5 Project Evolution and Alternatives of this Planning Statement. This involved an assessment historic, landscape and visual and socio-economic considerations.

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6.6.32 The assessment sets out a long-list of overarching principles which have been used to assess route options. These principles as a whole reflect the requirements of the 'Holford Rules' summarised above.

6.6.33 In addition to the 'Holford Rules', the 2021 draft NPS EN-5 (in so far as it is relevant to the consideration of this Project) introduced reference to the 'Horlock Rules' for the design and siting of substations which, the NPS requires should also be embodied in Applicant's proposals for the infrastructure associated with new overhead lines (paragraph 2.11.11 of the draft NPS EN-5). The 'Horlock Rules' were retained in subsequent revisions of the NPS and are set out at paragraph 2.9.19 of the November 2023 NPS EN-5.

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6.6.34 The 'Horlock Rules' provide further guidance on avoiding, minimising and mitigating the impacts of electricity network projects.

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6.6.35 The Landscape and Visual effects impacts are also addressed in ES Chapter 7 (Application Document 6.1). Where impacts remain, they are mitigated as far as is practicable and, where residual impacts remain, it is important to note that as these are not new features within the landscape but diverted existing facilities. In addition, these are considered to be justified in view of the benefits arising out of the Project as a whole as set out in the Need for the Project (Application Document 7.1) and the Benefits & Outcomes document (Application Document 7.20). Accordingly, it is considered that the Project accords with these additional requirements of NPS EN-5 (and, in so far as they are relevant to the Project, subsequent revisions of NPS EN-5).

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Audible noise

6.6.36 In recognising the provisions within NPS EN-1 paragraphs 5.11.4 and 5.11.6, an assessment has been undertaken of the likely operational audible noise impacts of the proposed permanent diversion of four National Grid Electricity Transmission (NGET) high voltage (HV) overhead transmission lines (OHLs). No receptors would experience an adverse impact due to noise from the realigned OHL sections necessary to facilitate the Project. The predicted OHL

noise levels would be acceptable and conclude 'No Adverse Impact' and as such accords with the requirements of NPS EN-1.

Draft, revised draft and final published Energy NPSs

6.6.37 The three energy NPSs (NPS EN-1, NPS EN-4 and NPS EN-5) relevant to the consideration of this DCO Application were all 'designated' in July 2011. All three are currently under review. Consultation draft versions of the three NPSs were published in September 2021 with revised drafts published in March 2023 and final versions published in November 2023. The revised draft NPSs were prepared in the context of Government's Energy White Paper published in December 2020 which presents its vision of how the country makes the transition to clean energy / 'net zero' by 2050.

6.6.38 The draft NPSs contained transitional arrangements which are now set out at paragraphs 1.6.2 and 1.6.3 of the November 2023 version of NPS EN-1. They state that:

6.6.39 'The Secretary of State has decided that for any application accepted for examination before designation of the *2023* amendments, the *2011* suite of NPSs should have effect in *accordance with the terms* of those *NPS.*

The 2023 amendments will therefore have effect only in relation to those applications for development consent accepted for examination, after the designation of those amendments. However, any emerging draft NPSs (or those designated but not yet having effect) are potentially capable of being important and relevant considerations in the decision-making process. The extent to which they are relevant is a matter for the relevant Secretary of State to consider within the framework of the Planning Act 2008 and with regard to the specific circumstances of each Development Consent Order application.'

6.6.40 Even though the final revised versions of the NPSs were published in November 2023 they have not yet been 'designated' by Parliament. It is anticipated that they may be designated on 19 December but, either way, they are likely to be designated prior to the finalisation of the Examining Authority's report and the Secretary of State's decision on the DCO application for the Project.

6.6.41 As such, and as indication of a 'direction of travel' of Government Energy Policy, references to the draft, revised draft and final published review Energy NPSs have been made in the preceding sections of this Planning Statement as appropriate where this is relevant and/or pertinent to the issue being presented. As requested by the Planning Inspectorate, full accordance tables are provided for both the designated and draft Energy NPSs at Appendix B to this Planning Statement. The Applicant has submitted a commentary on the weight to be afforded the final versions of the NPSs published in November 2023 in its Deadline 9 submission Applicant's response to ExA ISH 12 AP23 on Suite of Energy National Policy Statements [**Document Reference 9.211**].

6.6.42 In simple terms, in so far as they are relevant to the consideration of this Project, the manifestation of emerging Government Energy Policy reflected in the draft Energy NPSs seek to achieve the following objectives which may differ from the designated NPSs:

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'While the review is undertaken, the current suite of NPS … remain relevant government policy and EN-1 to 5 have effect for the purposes of the 2008 Act. They continue to provide a proper basis on which applications can be prepared, the Planning Inspectorate can examine, and the Secretary of State can make decisions on, applications for development consent.¶

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a. A diversification in energy supply capitalising on the use of innovative technologies;

b. A general decarbonisation of energy supply;

c. A target to achieve net zero greenhouse gas emissions by 2050 (rather than achieving an 80% reduction by that date) and achieving a 78% reduction by 2035 compared to 1990 levels;

d. An increased desire to achieve energy security in the light of recent world events;

e. Increased emphasis on energy storage;

f. A greater emphasis on the environmental impacts of energy infrastructure including biodiversity net gain;

g. In terms of gas, there is a recognition of the ongoing role for gas infrastructure in the transition to net zero and a need for continued investment in infrastructure and its maintenance in order to ensure increasingly efficient operation of the supply network; and

6.6.43 In terms of electricity, again the focus is on decarbonisation, guaranteeing robustness and security of supply in the transition to net zero. In practical terms there is a new emphasis on the use of permanent land rights rather than wayleaves, new guidance on measures to achieve bio-diversity net gain and on measures to reduce the landscape and visual impacts of electricity infrastructure. A key feature of the new NPS EN-5 is the introduction of a new and strong Government policy presumption in favour of undergrounding in National Parks and AONBs unless the harm of doing so outweighs the landscape and visual benefit. It is to be noted that the Project does not propose any new or diverted overhead lines within the Kent Downs AONB. Elsewhere pylon-supported overhead conductors remain the starting presumption.

6.6.44 The above comments on the status of the draft Energy NPSs notwithstanding, there are two additional 'generic impacts' included in the draft Energy NPSs which do not feature in any of the designated Energy NPSs. These impacts are greenhouse gas emissions and sulphur hexafluoride which are addressed below.

Greenhouse Gas Emissions

6.6.45 The first of these additional generic impacts is introduced in the draft revised NPS EN-1' and deals specifically with the matter of Greenhouse Gas Emissions (GGE). However, in broad terms it replicates the requirements of paragraphs 5.16 to 5.19 of the NPSNN in respect of Carbon Emissions. The November 2023 revised NPS EN-1 (paragraph 5.3.4) requires all proposals for energy infrastructure projects to be accompanied by a Greenhouse Gas (GHG) assessment.

6.6.46 The GHG assessment should be used to drive down GHG emissions at every stage of the proposed development to ensure that emissions are minimised as far as possible (paragraph 5.3.5).

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6.6.47 The revised NPS states that the SoS must be satisfied that the Applicant has, as far as possible, assessed the GHG emissions at all stages of the development and taken all reasonable steps to reduce the GHG emissions of the construction and decommissioning stage of the development (paragraphs 5.3.8 and 5.3.9 of the revised NPS EN-1).

6.6.48 These matters are addressed above in the earlier section of this chapter of the Planning Statement dealing with Carbon Emissions in the context of the NPSNN requirements. That section references the Carbon and Energy Management Plan (Application Document 7.19) and other relevant aspects of the ES (Application Documents 6.1, 6.2 and 6.3) and wider evidence base which demonstrate the steps taken to assess and minimise GHG emissions throughout the lifespan of the Project.

Sulphur hexafluoride

6.6.49 The second additional 'generic impact' is included in the draft revised NPS EN-5 in respect of electricity networks infrastructure and deals with the issue of sulphur hexafluoride (SF6). SF6 is an insulating and arc-suppressant gas used in high-voltage switchgear in electricity networks. It is an extraordinarily potent greenhouse gas and applicants should, as a rule, avoid its use in new developments (paragraph 2.9.59 of the revised November 2023 NPS EN-5).

6.6.50 Applicants are required to carefully consider whether, at the Project design stage, the proposed development could be reconceived to avoid reliance on the use of SF6 (paragraph 2.9.61 of the revised NPS EN-5). Where this is unavoidable, the Applicant is required to provide evidence of their reasoning and be able to demonstrate why alternatives to the use of SF6 are technically unfeasible or require bespoke components that are grossly disproportionate in terms of cost (paragraph 2.9.62 of the revised NPS EN-5).

6.6.51 Having followed the above procedure, if an Applicant considers that the use of SF6 is considered essential they must design a plan for the monitoring and control of fugitive SF6 emissions consistent with the F-gas regulation (paragraph 2.9.64 of the revised NPS).

6.6.52 National Grid Electricity Transmission has confirmed in writing that the Project would not involve the use of SF6.

6.7 Summary and Conclusion

6.7.1 This chapter of the Planning Statement has considered the accordance of the Project with relevant Government Planning Policy for NSIPs in the form of the NPSNN. It has focussed primarily on accordance with the NPSNN as that is the primary policy document relevant to new road infrastructure. In demonstrating accordance, it has drawn from the extensive evidence base supporting the DCO Application in the form of the various chapters and appendices of the ES (Application Documents 6.1 and 6.3) and other relevant Application Documents.

6.7.2 It has considered the following:

a. The need for the Project in NPS terms

b. Wider Government policy on the national networks

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c. NPS assessment principles

d. Generic NPS impacts

6.7.3 Where appropriate it has referred to other chapters of the Planning Statement which deal in more detail with some matters including to the need for the Project and the consideration of alternatives.

6.7.4 Given that the Project involves a number of diversions of energy infrastructure which, in themselves, meet the criteria to be considered NSIPs in their own right, the Chapter has also considered the relevant requirements of the following relevant Energy NPSs:

a. NPS EN-1 Overarching National Policy Statement for Energy

b. NPS EN-4 National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines

c. NPS EN-5 National Policy Statement for Electricity Networks

6.7.5 The Energy NPSs are also under review with draft versions of the aforementioned three Energy NPSs having been published in September 2021. In so far as they are relevant to the consideration of the Project, the relevant requirements of the draft NPSs have also been considered in this chapter.

6.7.6 The Applicant has also considered the March 2023 revised draft versions of the three Energy NPSs and the final versions published in November 2023 but they are not considered to raise any new matters relevant to the Energy NSIP elements of the Project and so require no further comment or response.

6.7.7 Taking the four matters identified in paragraph 6.7.2, in turn, it is firstly demonstrated that the Scheme Objectives accord with the Government's vision and strategic objectives for the national networks. The design of the Project and the measures to be employed in its construction and operation accord with Government's wider policy on the national network in terms of:

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a. Environmental and social impacts

b. Emissions

c. Safety

d. Technology

e. Sustainable transport

f. Accessibility

g. Road tolling and charging

6.7.8 Similarly, compliance is demonstrated with the general assessment principles for determining DCO applications in terms of:

a. Environmental Impact Assessment

b. Habitats Regulations Assessment

c. The consideration of alternatives

d. Design

e. Climate Change

f. Pollution and other environmental protection regimes

g. Common law and statutory nuisance

h. Safety

i. Security

6.7.9 In considering the Project's accordance with the 'generic impacts' identified in the NPSNN (and other relevant NPSs) it is acknowledged that the construction and operation of the Project would give rise to a number of adverse impacts. The Applicant has sought wherever reasonably practicable to avoid adverse impacts arising. However, given the nature, scale and extent of the Project, it is inevitable that some adverse impacts are likely to arise. Where it has not been possible to avoid impacts arising, mitigation has been proposed in the form of mitigation embedded into the design of the scheme and essential mitigation in the form of specific measures and the form of working practices and arrangements. Where it has not been possible to mitigate for the impacts, compensatory measures are proposed. Even with these, however, it is acknowledged that there would still be some residual adverse impacts.

7 Other matters of potential importance and relevance

7.1 Introduction

7.1.1 The preceding chapters of the Planning Statement have primarily considered the statutory requirements of the Planning 2008 Act and the provisions of the NPSNN and Energy NPSs (EN-1, EN-4 and EN-5 and, in so far as they may be relevant, the September 2021 draft revisions to EN-1, EN-4 and EN-5). However, there are a number of other 'important and relevant' matters which the decision maker is required under Section 104(2)(d) of the 2008 Act to consider. The key 'other matters' that the Applicant considers to be both important and relevant are as follows:

a. National Policy Statement for Ports (DfT, 2012)

b. National Planning Policy Framework and Guidance

c. Road Investment Strategy 2

d. Union Connectivity Review

e. Other relevant government publications and strategies

f. Development plan policy

g. Other major developments

7.1.2 Section 104(aa) requires the decision maker to have regard to any appropriate marine policy documents and this chapter also addresses any relevant marine plans.

7.1.3 Each of these matters are addressed in turn below. It is worth reiterating that the SoS will the use the NPSs as the primary basis for decision making (and must decide the application in accordance with any relevant NPS under section 104(3)) but other matters can be important and relevant under 104(2) of the Planning Act 2008. In respect of the marine plans, it is worth noting that appropriate marine policy must be considered by the Secretary of State under section 104(2)(aa) of the Planning Act 2008.

7.2 National Policy Statement for Ports

7.2.1 The National Policy Statement for Ports (Ports NPS) was published in July 2012. In accordance with the provisions of the Planning Act 2008, it provides a framework for decisions on new port development. It also applies, where relevant, to associated development (such as road and rail links) for which consent is sought alongside the principal development.

7.2.2 To the extent that the Proposed Development affects the use and development of land that is or is capable of becoming NSIP development under any of sections 15 to 30A of the Planning Act 2008 and for which a National Policy Statement or Statements have been prepared or designated under Part 2 of Planning Act 2008, those documents are capable of being important and

relevant to the Secretary of State's decision under section 105 of the Planning Act 2008.

7.2.3 It may be relevant to the Project in that it is proposed that, during the construction of the Project, the Applicant may be a customer of existing port facilities on the north bank of the River Thames to import construction material as a more efficient and effective alternative to transporting materials by road (paragraph 3.3.5 of the Ports NPS). The precise extent of this use is yet to be determined but it is anticipated to be in the region of 30-40% of imports of bulk aggregates north of the River and below the Tilbury loop railway (see the outline Materials Handling Plan (Application Document 6.3, Appendix 2.2)). However, no development is proposed at any port as part of the Project to enable this use to occur.

7.2.4 The Project does not comprise port development. Consent is not being sought for the Project alongside any port development. The works associated with the construction and operation of the Project are not associated with port development. The completion of the Project will not prevent, hinder or impact on port development in any regard other than as described below in terms of the potential use of port facilities. The Ports NPS is not therefore a 'relevant NPS' under section 104(2)(a) but is a potentially 'important and relevant' consideration under section 104(2)(d).

7.2.5 Application Document 7.17 highlights the 'Interrelationship with other Nationally Significant Infrastructure Projects and Major Development Schemes'. It shows how the Applicant has worked with third-party project promoters to design out and control interfaces between the Project and those schemes to avoid prejudicing their successful delivery. The schemes identified include ports and port development in the form of the following:

a. Tilbury2

b. Thames Freeport

c. DP World London Gateway

7.2.6 The measures set out in the document demonstrate how the Applicant has sought to ensure that the Project does not prejudice the delivery of those proposals and supports development and regeneration in the Lower Thames area in accordance with the objectives of the NPSNN (paragraphs 2.6 and 2.13) as well as the Scheme Objectives for the Project.

7.2.7 One of the aims of the Project is to facilitate quicker and more efficient access for traffic using existing ports in London and elsewhere across the River Thames. However, this is part of a wider objective to improve access and connectivity across the river which, in turn, is part of a wider economic objective to foster sustainable economic growth and increase accessibility by relieving existing congestion at the Dartford Crossing and support development of the ports (see Application Document 7.1: Need for the Project). As such, it would increase the accessibility to/from the Thames ports which will allow them to support sustainable economic growth which is one of the ambitions of the Ports NPS (paragraph 3.3.1). It is also consistent with the first sub-bullet to the first bullet point of paragraph 4.1.1 of the Ports NPS which states that the Government's objectives for transport include:

> 'to promote economic growth through improving networks and links for passengers and freight, as well as ensuring an efficient and competitive transport sector both nationally and internationally*'.*

7.2.8 Section 5.4 of the Ports NPS identifies the impacts Port development can have on the road infrastructure which surrounds. It also recognises that measures can be implemented to mitigate those impacts. These policies are not directly applicable, however the impacts of the Project have been assessed through the preparation of the Transport Assessment (Application Document 7.9) which includes the forecast impact caused by the Project's construction traffic on the road network including access for the Thames ports. Traffic management measures would be secured through the Framework Construction Travel Plan and the outline Traffic Management Plan for Construction (Application Documents 7.13 and 7.14 respectively) which are secured through Requirements 10 and 11 of Part 1 of Schedule 2 of the dDCO (Application Document 3.1). These control documents require the preparation of traffic management plans for construction and construction travel plans prior to the commencement of works. The operational impacts are managed and monitored in accordance with the WNIMMP (Appendix F of the Transport Assessment (Application Document 7.9).

7.2.9 Accordingly, the Applicant has assessed and taken into account the provisions of the Ports NPS in the preparation of this DCO application in so far as it is relevant to the Project. It is considered that the Project accords with those limited parts of the Ports NPS which are relevant to the determination of this DCO application.

7.3 National Planning Policy Framework and Guidance

7.3.1 Paragraph 1.17 of the NPSNN identifies that the NPS and the NPPF have consistent strategic aims but play different roles, the NPPF being a framework for local authorities to develop local plans and bring forward developments. Paragraph 1.18 of the NPSNN identifies that the NPPF is '*likely to be an important and relevant consideration in decisions on nationally significant infrastructure projects, but only to the extent relevant to that project'*. Paragraph 1.19 of the NPSNN (repeated in paragraph 5 of the NPPF) makes it clear, however, that the NPPF does not contain specific policies for NSIPs.

7.3.2 Paragraph 3.3 of the NPSNN states that:

> 'In delivering new schemes, the Government expects applicants to avoid and mitigate environmental and social impacts in line with the principles set out in the NPPF and the Government's planning guidance.'

7.3.3 The various chapters of the NPSNN provide guidance on when the provisions of the NPPF might be relevant to the consideration of impacts associated with a DCO application. These include assessments relevant to the following matters:

a. Habitats Regulations Assessment

b. Biodiversity and ecological conservation

c. Flood Risk

d. Land instability

e. Landscape and visual impacts

f. Green Belt

g. Noise and vibration

7.3.4 In all of these instances, the evidence base produced in support of the DCO application in the form of the HRA (Application Document 6.5) and the ES (Application Document 6.1) have considered the requirements of the NPPF and its supporting practice guidance in the assessment of project impacts, project design and mitigation / compensations provisions.

7.3.5 Accordingly, in accordance with the stipulations of the NPSNN, the Applicant has given due consideration to the NPPF where it is relevant to do so in so far as it is important and relevant to the matter under consideration.

7.4 Marine plans

7.4.1 Marine plans guide those who use and regulate the marine area to encourage sustainable development while considering the environment, economy and society. Marine plans apply only in their area, but if a proposed activity may affect the plan area, this should be acknowledged and considered in the application and decision making under s104(2)(aa) of the Planning Act 2008.

7.4.2 Marine plans are prepared by the Marine Management Organisation (MMO) under the provisions of the Marine and Coastal Access Act 2009. There are 11 marine plan areas in England. These plans help deliver the high level marine objectives set out in the UK Marine Policy Statement. Insofar as it is relevant, the Project sits within the South East Inshore Marine Plan (Defra, 2021) area by virtue of the fact that it crosses the River Thames.

7.4.3 The South East Inshore Marine Plan provides a policy framework which would be used to help inform decision-making on what activities take place in the marine environment and how the marine environment is developed, protected and improved in the next 20 years. It provides a clear, evidence-based approach to inform decision-making by marine users and regulators on where, when or how activities might take place within the South East marine area, balancing environmental, economic and social factors.

7.4.4 The plan area overlaps with 42 local authorities and three AONBs. The River Thames has a large influence on the South East Inshore Marine Plan area.

7.4.5 The potential relevance of the plan for this Project is that the plan covers the waters of any estuary, river or channel so far as the tide flows at mean high water spring tide meaning it includes the waters of the River Thames. Policies of potential relevance to the consideration of this DCO application include the following:

a. SE-INF-1 Infrastructure

b. SE-HER-1 Heritage assets

c. SE-SCP-1 Seascape and landscape

d. SE-CC-2 Climate change resilience and adaptation

e. SE-AIR-1 Air quality and emissions

f. SE-WQ-1 Water quality

g. SE-UWN-2 Underwater noise

h. SE-CE-1 Cumulative effects

i. Section 3 on the mitigation hierarchy

7.4.6 The Applicant has considered the South East Inshore Marine Plan in the preparation of the Project and, given the limited interface in the marine area, has concluded that the Project does not conflict with it.

7.4.7 In any event, the matters addressed by the marine plan policies do not introduce any new or additional matters which are not already covered (and addressed in the Project proposals) in any of the NPSs or other policy or statutory instrument with which the Project has to comply.

7.4.8 Furthermore, the MMO has been extensively engaged in the formulation of the Project proposals as evident in the relevant chapters of the ES (Application Document 6.1) and supporting Appendices.

7.4.9 Accordingly, it is concluded that the Project does not conflict with the requirements of the South East Inshore Marine Plan.

7.5 Road Investment Strategy 2 (RIS 2)

7.5.1 In 2014 Government committed to a five-year funding settlement to allow Highways England (as was) and its supply chain to plan their work efficiently and provide the confidence needed for them to make the appropriate investments necessary to deliver the scale of improvements planned to the road network. The Road Investment Strategy 1 for the period 2015-2020 (RIS1) identified the need to develop route options for a new crossing of the Thames to the east of London for inclusion in the new Road Period.

7.5.2 RIS2, covering the period 2020-2025, was published in March 2020. It sets a long-term strategic vision for the network and specifies the performance standards Highways England must meet. It also lists the planned enhancement schemes Government expects to be built and commits the funding needed to deliver these schemes totalling £27.4bn.

7.5.3 Delivery of the Lower Thames Crossing is identified as one of three major commitments of RIS2 (page 74), the provision of which will allow:

> '… the Thames Estuary to flourish as an area in its own right and overcome historic problems of deprivation.' (see graphic on page 90 and Scheme E30 on page 100).

7.5.4 The strategy also notes about the Project (page 101) that:

> '***Lower Thames Crossing***
>
> RIS1 proposed to investigate a new crossing of the River Thames, to relieve the heavy congestion at Dartford. This not only creates serious delays for those seeking to cross the Thames, but also serves as a

> barrier to the development of the Thames Estuary – an area with significant levels of deprivation.
>
> In late 2018, Highways England outlined its detailed plans for a new tunnel between Essex and Kent, coupled with supporting link roads. This will provide three lanes across the Thames in each direction, almost doubling capacity east of the Blackwall Tunnel.
>
> This project will also have a national impact, allowing freight traffic to the Continent to bypass Dartford, and have an uncongested route to Dover. We expect to investigate linked improvements on the A2 into Kent as part of the pipeline of work for the next RIS.'

7.5.5 The need for the Project is reported in greater detail in Application Document 7.1: The Need for the Project. The fact that the Project is being brought forward by National Highways and that it is supported by an economic, environmental and social assessment (see the Economic Appraisal Report Appendix D of the Combined Modelling and Appraisal Report (ComMA (Application Document 7.7)) is therefore wholly consistent with the RIS2.

7.6 Union Connectivity Review

7.6.1 The Union Connectivity Review (UCR) Final Report was published by DfT in November 2021. It recognises the vital role transport connectivity plays in delivering economic growth, job creation, meeting the nation's housing needs, achieving social cohesion and helping to deliver wider government objectives such as the 'levelling up' agenda and 'net zero'. It identifies a number of key initiatives and interventions which need to be made in the nation's transport network in order to deliver these wider policy objectives. One of these is '*securing better connectivity for freight across the UK with ports and freeports (as they are established).*'

7.6.2 Amongst the suite of recommendations in the report are that the UK Government should:

> 'Design and implement UKNET – a strategic transport network for the whole of the United Kingdom, and commit funding to improve the network, in particular, the parts that are not performing well;
>
> Plan improvements to the network using multimodal corridors, which should be reviewed regularly and appraised on a wider economic basis in order to support government objectives such as levelling up and net zero'.

7.6.3 The UCR report identifies a series of key transport corridors which reach to all parts of the UK. Each of these corridors serves a crucial function in connecting people to key metropolitan centres for access to jobs, services and transport hubs. They also connect businesses to the freight network (such as at ports and airports) and to regional consumer and labour markets.

7.6.4 The Project would sit at the heart of the network at the intersection of the following transport corridors which converge on London:

a. Kent corridor

b. South coast corridor

c. South Wales corridor

d. Eastern corridor

e. East coast corridor

f. West coast corridor

7.6.5 The UCR report identifies the challenge of connecting ports and freeports to the wider transport network.

7.6.6 Accordingly, delivery of the Project at this vital intersection location would help improve the effectiveness of the operation of the transport network as a whole, would also facilitate objectives relating to freight access to and from the country's key ports, so facilitating much improved access from the southern ports to the rest of the country beyond the River Thames. These matters are elaborated in the Need for the Project (Application Document 7.1) and the Benefits and Outcomes Document (Application Document 7.20).

7.7 Levelling Up the United Kingdom White Paper (2022)

7.7.1 The Government's Levelling Up the United Kingdom White Paper (Department for Levelling Up, Housing and Communities, 2022) recognises transport infrastructure has an important role in reducing 'distances' between people and improving market access for people, firms and workers. Transport infrastructure is one of the Government's core tools in the levelling up approach in driving improvements in productivity, pay, jobs and living standards.

7.7.2 The Levelling Up White Paper, identifies the Project as a strategic road investment which has the capacity to boost productivity, pay, jobs and living standards which would ultimately level up different areas of the country. The Project is anticipated to act as a major road improvement certainly for the East and South East of England, and also for London where the Project will increase capacity across the Thames East of London by over 90%.

7.8 National Infrastructure Strategy (2020)

7.8.1 The Government followed up the National Infrastructure Assessment (2018) with the publication of the National Infrastructure Strategy (2020). The strategy sets out the Government's plan for role of infrastructure in addressing the country's needs and to redress long-standing inequalities, particularly in transport, between different parts of the United Kingdom. The Project is identified as a part of the Government's record investment in strategic roads to connect the regions and nations of the United Kingdom and create a united and Global Britain.

7.9 Build Back Better policy paper (2021)

7.9.1 The Build Back Better policy paper (HM Treasury, 2021) sets out how the Government seeks to guide the UK economy to recover from the effects of the COVID-19 pandemic in a timely and sustainable manner. The Government seeks to do this by building on three core pillars of growth across infrastructure, skills and innovation. The Project is explicitly cited in that document. In particular, it is noted that the Government seeks to invest in '*infrastructure to*

transform delivery and support private investment' and this includes the Lower Thames Crossing.

7.10 Second National Infrastructure Assessment Baseline Report (2021)

7.10.1 The Second National Infrastructure Assessment Baseline Report (National Infrastructure Commission 2021b) sets out the current state of the UK's economic infrastructure. It includes a survey of the state of the national systems of transport infrastructure. The Report identifies supporting levelling up as a key strategic theme for the assessment, linking the use of transport infrastructure with reducing disparities between places and improving opportunities for people.

7.10.2 Section 4.1 of the Report states '*improvements in the transport sector can have the greatest impact'*, supporting economic productivity and quality of life by addressing constraints to growth and contributing to economic transformation in particular places. The Report specifically states that '*transport connections can increase the density of high productivity clusters of people and businesses in cities, facilitate trade between cities, make places more attractive to live and work in, and encourage investment in places*' The Level 3 Wider Economic Impacts Report (Appendix D of the Combined Modelling and Appraisal) makes clear how the Project creates the potential for substantial economic benefits which is based on facilitation between Kent, Thurrock and Essex.

7.10.3 The policies and strategies at a national level referred to above is not an exhaustive list, but clearly indicates the breadth of policy support for the development of essential infrastructure, and specifically the Project, in support for the economic and social development of the United Kingdom.

7.11 Development plan policy

7.11.1 This section of the Planning Statement provides a high-level summary of the assessment of the Project against local plan, minerals, waste and transport policies for each of the 'host' local authorities. Whilst the NPSs which have effect represent the primary policy basis for decision making, other matters which the decision maker may consider to be both 'important and relevant' to decision making may include local development plan documents. Appendix C provides a full assessment of the Project against individual local plan policies which could be considered important and relevant to the consideration of the Project. However, the sections below provide a summary of the extent to which the Project is consistent with the requirements of the key policies in each authority area / plan.

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7.11.2 Whilst some of the policies in development plans may be important and relevant, where they related to generic issues they will already be covered by the policy tests in the NPSs. In view of the primacy of the NPSs, (paragraph 1.2 of the NPSNN) in the event that there is a conflict between local policy and the provisions of an NPS, the NPS prevails for the purposes of decision making given the national importance of NSIPs (and that NPS policies are intentionally specifically drafted to recognise this importance). Development plan policies

which are likely to be potentially relevant and important are planning policy designations that are not replicated in the NPS.

7.11.3 Neighbourhood Plans, once adopted, also form part of the Development Plan and so should be accorded appropriate weight in local decision-making. There are no designated neighbourhood plan areas or draft, 'made' or adopted neighbourhood plans within or adjacent to the Order Limits.

7.11.4 The remainder of this chapter identifies the relevant adopted policy documents by local authority area and those emerging documents making their way through the local plan adoption process for each of the host authorities directly affected by the Project. The various plans in place and their current status are set out in Table 7.1. Where local plans have been adopted, they constitute the statutory Development Plan for planning decisions where an application is made to that local planning authority. The extent to which emerging plans are considered to be a material consideration in determining planning applications (or important or relevant under s104(2)(d)) will depend on, amongst other things, the stage reached in their preparation.

7.11.5 The chapter identifies those key areas where there might be considered to be an inconsistency with local policy or where development plan policies are consistent, but policy tests are adequately provided in the relevant NPSs. It also identifies the Applicant's response to those areas of inconsistency and the weight which the Applicant considers should be attached to it compared to higher level policy set out in the NPSNN and other relevant NPSs. It is noted that there will be inconsistencies between local policies and NPS policy as the latter is prepared under a different legislative framework (the 2008 Act) to local policy and, in some instances, is intentionally different to recognise the national importance of NSIPs. These differences are a common feature of the consideration of DCO applications across the board and are not unique to the consideration of this DCO application.

7.11.6 It is worth reiterating that this section constitutes a high-level summary of the local policy situation. The full wording of all local plan policies considered both important and relevant to the Project and a detailed comment demonstrating how the Applicant considers the Project accords with those policies is provided in full in Appendix C to this Planning Statement.

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7.12 Summary of local policy context

7.12.1 Table 7.1 identifies the relevant planning policy documents in the various administrative areas through which the Project crosses.

Table 7.1 Relevant development plan documents

Appendix C Table Number	Plan	Status
Kent		
C.2	Maidstone Borough Local Plan 2011 – 20	Adopted Oct 2017
C.3	Maidstone Borough Local Plan Review	Reg 19 Consultation Oct – Dec 2021
C.4	Tonbridge and Malling Core Strategy	Adopted Sept 2007
C.5	Tonbridge and Malling Local Plan	Local Plan abandoned post-examination in 2021. Regulation 18 Consultation issued 22 September 2022
C.6	Gravesham Local Plan Core Strategy	Adopted Sept 2014
C.7	Gravesham Local Plan Regulation 18 Stage 2 Consultation: Draft Development Management Policies Document	Reg. 18 consultation: October to December 2020
C.8	Gravesham Local Plan Regulation 18 Stage 2 Consultation: Draft Local Plan Review & Site Allocations Document	Reg. 18 consultation: October to December 2020
C.9	Kent Minerals and Waste Local Plan 2013-2030	Adopted September 2020
C.10	Kent Local Transport Plan 4: 2016-2031	Adopted June 2017
Essex		
C.11	Thurrock Core Strategy and Policies for the Management of Development	Adopted Jan 2015
C.12	Thurrock Local Plan – Issues and Options (Stages 1 & 2)	Stage 1 Feb 2016 Stage 2 Dec 2018 LDS anticipated 2022
C.13	Thurrock Local Plan: Initial Proposals	Council 6 December 2023
C.14	Brentwood Local Plan 2016-2033	Adopted 23 March 2022
C.15	Essex Minerals Local Plan	Adopted July 2014. Consultation on proposed amendments ended April 2021. Non-Statutory engagement on Policy S6 & notification of call for sites for sand & gravel extraction Feb-March 2022.
C.16	Essex and Southend-on-Sea Waste Local Plan	Adopted July 2017
C.17	Essex Transport Strategy: The Local Transport Plan for Essex	Published June 2011

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Appendix C Table Number	Plan	Status
London		
C.18	Havering Local Plan 2016-31	Adopted Nov 2021
C.19	The London Plan	Adopted March 2021
C.20	The Joint Waste Development Plan for East London Waste Authority Boroughs	Adopted Feb 2012
C.21	Mayor's Transport Strategy	Adopted March 2018

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7.12.2 Table 7.2 identifies what are considered to be other relevant local policy documents in the form of Supplementary Planning Documents and other relevant local strategies and plans (greater detail is set out in Appendix C to this Planning Statement).

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Table 7.2 Other relevant local policy documents

Authority	Document Name	Date
Kent County Council	SPG1: Landscape Character	July 2006
Kent County Council	SPG2: Biodiversity	July 2006
Kent County Council / Kent Downs Trust	Kent Downs AONB Management Plan 2021-2026	Sept 2021
Kent County Council	Kent Rights of Way Improvement Plan	Not dated
Essex County Council	Essex Rights of Way Improvement Plan	Not dated
Greater London Authority	All London Green Grid SPG	March 2012
Greater London Authority	London's Foundations SPG	March 2012
Greater London Authority	Circular Economy Statements LPG	March 2022
Greater London Authority	Energy Planning Guidance	June 2022
Greater London Authority	Control of dust and emissions in construction SPG	July 2014
Greater London Authority	Whole life carbon LPG	March 2022
Greater London Authority	Draft Air quality positive LPG	Nov 2021
Greater London Authority	Draft air quality neutral LPG	Nov 2021
Greater London Authority	Draft urban greening factor SPG	Sept 2021
Greater London Authority	Practice note on Contaminated Land	Not dated
LB Havering	Heritage SPD	2011

7.12.3 In summary, the key topic areas contained within development plan policy that are relevant to the Project are broadly the same as those identified in respect of the NPSs:

a. Inappropriate development in the Green Belt

b. Impacts on AONB

c. Loss of ancient woodland

d. Impacts on heritage assets

e. Impacts on ecology and biodiversity

f. Loss of areas of the Best and Most Versatile Agricultural Land

g. Localised visual and landscape impacts

h. Loss of some open space / recreational land

i. Localised increases in traffic on the road network

j. Localised impacts on air quality

k. Impact on regional landfill capacity

l. Parts of the Project located in areas at medium / high risk of flooding

m. Short-term, localised construction impacts in terms of the construction activity itself including noise

7.12.4 The Project has committed to take all reasonable steps to limit adverse effects through both the design and operation of the Project or through best practice construction and working practices. Where adverse impacts which would otherwise fall within the scope of a local policy are identified, a justification is given for that alongside a summary of any mitigation or compensation proposed as part of the Project. An explanation is provided as to how the Applicant considers any local policy concerns should be viewed in the policy context provided by the NPSs.

7.12.5 By definition, SPD is supplementary to a planning policy in an adopted local plan. So, in most cases the response to any issues raised in SPD is addressed in response to the relevant local plan policy.

7.13 Assessment of importance and relevance of local policy

7.13.1 This section provides a brief description of the main elements of the Project that fall within each local authority area and an overview of the identified impacts and inconsistencies with local policy. It does not address all of those local policies with which it is considered the Project is consistent. These can be viewed in full in Appendix C, as can a more detailed assessment of all relevant local policy.

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Maidstone Borough Council

7.13.2 The Maidstone Borough Local Plan 2011-2031 was adopted in October 2017. Work is underway on a replacement plan which reached the Regulation 19 stage for submission as at October 2021. It underwent public consultation between the 29 October and 12 December 2021.

7.13.3 The impacts of the Project on Maidstone Borough are solely confined to the proposed location of a Nitrogen Deposition Compensation Site at Blue Bell Hill, north of Frith Wood / Westfield Wood south of the M2, east of the A229 which straddles the Maidstone Borough / Tonbridge & Malling Borough Council areas.

7.13.4 The Blue Bell Hill site is 43.2ha in area. It lies within countryside and the North Kent Downs AONB. It is adjacent to two areas of ancient woodland (Malling Wood and Westfield Wood). The latter also forms part of the North Downs SAC, the Wouldham to Detling Escarpment SSSI and the Boxley Warren LNR.

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7.13.5 The purpose of the site is to create new areas of habitat as compensation for the deposition of nitrogen oxides which may be emitted from fossil fuel powered vehicles using the Project. It comprises areas of habitat creation including new tree planting and does not constitute physical built development. The compensation proposals have been developed in association with Natural England. Accordingly, they should be considered as a beneficial impact of the Project and so consistent with the principles of local policy.

7.13.6 Appendix C to this Planning Statement contains a detailed assessment of the Project against the following Maidstone Borough Council policies:

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a. Adopted Maidstone Borough Local Plan 2011-2031

   i. SS1: Maidstone Borough Spatial Strategy (part)
   ii. SP17: The Countryside (part)

b. Maidstone Borough Regulation 19 Draft Plan for Submission (October 2021)

   i. LPRSS1: Maidstone Borough Spatial Strategy (part)
   ii. LPRSP9: Development in the Countryside (part)
   iii. LPRSP14A: Natural Environment (part)

Tonbridge and Malling Borough Council

7.13.7 The Tonbridge and Malling Core Strategy was adopted in September 2007. Work commenced on a review of this core strategy in 2012 but it was withdrawn following a recommendation from the Planning Inspectorate in July 2021. A regulation 18 consultation local plan was issued on 22 September 22 and is out for public consultation until 3 November 2022. As a regulation 18 consultation document it does not contain any draft policies or allocations. Rather, it is an 'issues and options'-type consultation produced to elicit views on the principles that should determine where new homes and infrastructure improvements should be developed across the borough. There is a reference to the Project at paragraph 5.5.16 which states that:

> '…If approved the delivery of the Lower Thames Crossing project will consume capacity on key routes linking the M20 and M2, requiring mitigation including junction improvements which are not currently funded…'

7.13.8 As this regulation 18 consultation plan is at such an early stage in its preparation it can be afforded little, if any, weight in the decision-making process. Accordingly, the 2007 Core Strategy constitutes the adopted development plan for the borough.

7.13.9 The impacts of the Project on Tonbridge and Malling Borough are solely confined to the proposed location of a nitrogen deposition compensation site at Blue Bell Hill, north of Frith Wood / Westfield Wood south of the M2, east of the

A229 which straddles the Maidstone Borough / Tonbridge & Malling Borough Council areas.

7.13.10 The Blue Bell Hill site is 43.2ha in area. It lies within the countryside and the North Kent Downs AONB. It is also adjacent to two areas forming part of the Wouldham to Detling Escarpment SSSI and Frith Wood.

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7.13.11 The purpose of the site is to create new areas of habitat as compensation for the deposition of nitrogen oxides which may be emitted from fossil fuel powered vehicles using the Project. It comprises areas of habitat creation including new tree planting and does not constitute physical built development. The compensation proposals have been developed in association with Natural England. Accordingly, they should be considered as a beneficial impact of the Project and are in accordance with local policy.

7.13.12 Appendix C to this Planning Statement contains a detailed assessment of the Project against the following Tonbridge and Malling Borough Council policies:

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a. Policy CP5: Strategic Gap

b. Policy CP6: Separate Identity of Settlements

c. Policy CP7: AONB (part)

d. Policy CP14: Development in the Countryside (part)

Gravesham Borough Council

7.13.13 The Gravesham Local Plan Core Strategy was adopted in September 2014. Both a regulation 18 Stage 2 Consultation Draft Development Management Policies Document and a Draft Local Plan Review and Sites Allocations Document were published for consultation in October 2020.

7.13.14 The entirety of the built development of the Project south of the River Thames lies within Gravesham Borough. It includes the junctions of the Project road with the A2/M2, improvements to the A2 corridor the new Project road running north from the A2 and associated construction, earth and bridge works to the South Portal and beyond (in a tunnel) to the River Thames. It includes the South Portal works, tunnel boring activity, creation of works compounds and creation of new recreational resource at the South Portal.

7.13.15 The full extent of the Project within Gravesham Borough lies within land designated as Green Belt. The Project constitutes inappropriate development in the Green Belt in policy terms. Policy CS02 of the adopted Local Plan and paragraph 3.1.4 of the emerging draft Development Plan Polices document are relevant in this regard. The Applicant demonstrates in Appendix G to this Planning Statement that very special circumstances exist to justify the location of the development in the Green Belt.

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7.13.16 Land at the junction of the A2/M2 and to the west along the A2 lies within land forming part of the Kent Downs AONB. Both local and national policy prescribe that the greatest weight will be given to the conservation and enhancement of the landscape and natural beauty of the AONB and its setting. This is reflected in the wording of Policy CS12 of the adopted local plan. It is acknowledged that the Project would have adverse impacts on small parts of the AONB. However, some of these would be temporary in nature and, where they are not, mitigation

and compensatory measures are proposed to reduce these impacts. Where residual impacts remain, these are justified on the basis of the overall national need for the Project and the wider benefits it would bring which are considered to override these localised impacts and so accord with national policy set out in the relevant NPSs as explained in Chapter 5 and Appendix F of this Planning Statement.

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7.13.17 There would be permanent habitat impacts on a number of other nationally and internationally designated sites in the borough (Shorne and Ashenbank Woods SSSI in particular which include areas of ancient woodland which is an irreplaceable resource). Policy CS12 of the adopted local plan and GI-5 of the emerging draft local plan are particularly relevant in this regard. The consideration of alternative routes and the Project design has minimised and mitigated these impacts and there is compensatory provision incorporated in the Project proposals at Shorne Woods within the borough to further address these impacts. The proposals comply with the NPS policy tests of 5.29 of the NPSNN (and 5.3.11 of EN-1 in so far as it is applicable) as demonstrated in Chapters 5 and 6 of this Planning Statement, which present the primary policy basis for decision making for the Project. The proposals are also consistent with the principles of paragraph 5.7.25 of Policy CS12.

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7.13.18 There would be adverse impacts in respect of the Church of St Mary Grade II* listed building and the Thong Conservation Area (Policy CS20 of the adopted local plan and Policy HER-1 of the emerging draft Local Plan) and impacts on a number of open spaces in the borough (Policy CS13 of the adopted Local Plan and policy GI-1 of the emerging draft Local Plan). Mitigation measures are proposed to address these impacts and replacement recreational land is planned as part of the Project to accord with NPS and also reflect the provisions of Policy CS13 and CS20. Heritage impacts are discussed in detail in Chapter 5 and 6.

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7.13.19 Appendix C to this Planning Statement contains a detailed assessment of the Project against the following policies in the Gravesham Local Plan Core Strategy 2014:

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a. Policy CS01: Sustainable Development
b. Policy CS02: Scale and Distribution of Development (part)
c. Policy CS07: Economy, Employment and Skills (part)
d. Policy CS10: Physical and Social Infrastructure
e. Policy CS11: Transport (part)
f. Policy CS12: Green Infrastructure
g. Policy CS13: Green Space, Sport and Recreation
h. Policy CS18: Climate Change (part)
i. Policy CS19: Development and Design Principles (part)
j. Policy CS20: Heritage and the Historic Environment (part)

k. Appendix C to this Planning Statement also contains a detailed assessment of the Project against the following policies in the Gravesham Local Plan Regulation 18 Stage 2 Consultation Part 2: Development Management Policies Document October 2020 Strategy 2014:

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l. Paragraph 3.1.4: Green Belt

m. Policy AG-1: Agricultural Land

n. Policy INF1: Route Safeguarding

o. Policy INF-2: Transport Design Principles

p. Policy INF-3: Understanding and Mitigating Transport Impacts

q. Policy INF-4: New Accesses and Junctions

r. Policy GI-1: Open Space, Playing Pitches and Sports Facilities Retention

s. Policy GI-4: Trees, Hedgerows and Woodland

t. Policy GI-5: Landscape Character

u. Policy GI-6: Biodiversity (part)

v. Policy FW-1: Managing Water Quality

w. Policy FW-3: Managing Flood Risk

x. Policy FW-4: Managing Waste Water Drainage (part)

y. Policy FW-5: Managing Surface Water Drainage

z. Policy AM-1: Air Quality

aa. Policy AM-2: Contaminated Land

bb. Policy AM-3: Light Pollution

cc. Policy AM-5: Noise and Vibration

dd. Policy HER-1: Development involving Heritage Assets

ee. Policy HER-4: Archaeology

Kent County Council

7.13.20 Kent County Council is the statutory Minerals & Waste Planning Authority and also the Highway Authority for that part of the Project which sits within the county of Kent. Accordingly, the relevant planning documents to be considered are as follows:

a. Kent Minerals & Waste Local Plan 2013-2030

b. Kent Local Transport Plan 4: 2016-2031

Kent Minerals & Waste Local Plan 2013-2030

7.13.21 The Kent Minerals & Waste Plan 2013-2030 was originally adopted in July 2016 but underwent an early partial review on several policies which was adopted in September 2020.

7.13.22 In compliance with Policy CSW 2: Waste Hierarchy, requiring proposals to ascend the waste hierarchy whenever possible, the Project has demonstrated the implementation of the waste hierarchy in dealing with waste arisings. Details are also provided on how the Project would minimise the production of construction, demolition and excavation waste and its management in line with Policy CSW 3: Waste Reduction.

7.13.23 Policy DM 7: Safeguarding Mineral Resources sets-out policy criteria to be met for non-mineral development within minerals safeguarding areas (MSAs) in order to be considered acceptable. The Mineral Safeguarding Assessment Report (Application Document 6.3**,** ES Appendix 11.2) has concluded that there are no proposals to extract mineral resources from MSAs in Kent as this is likely to impact on an adjoining Ramsar site. The impact on Minerals Safeguarding Areas is also considered in Chapter 6.

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7.13.24 Appendix C to this Planning Statement contains a detailed assessment of the Project against the following policies of the Kent Minerals and Waste Local Plan (2013-2030):

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a. Policy CSM1: Sustainable Development (part)
b. Policy CSM5: Land-won Mineral Safeguarding
c. Policy CSW2: Waste Hierarchy
d. Policy CSW3: Waste Reduction
e. Policy CSW11: Permanent Deposit of Inert Waste
f. Policy DM7: Safeguarding of Mineral Resources
g. Policy DM9: Extraction of Minerals in Advance of Surface Development

The Kent Local Transport Plan was adopted in June 2016

7.13.25 It identifies the Lower Thames Crossing as a strategic transport priority, noting that the Project would enable the Council's policy of bifurcation (splitting traffic between the two motorway corridors) to be enacted. The Plan states that, *'we are clear that a new Lower Thames Crossing, to the east of Gravesend, is required to unlock growth, improve journey time reliability, improve network resilience, and enable opportunities for regeneration'*

7.13.26 The Plan includes a number of 'Stated Outcomes' of which outcomes 1, 3, 4 and 5 are considered relevant to the Project:

a. Outcome 1: Economic Growth and Minimised Congestion
b. Outcome 3: Safer Travel
c. Outcome 4: Enhanced environment
d. Outcome 5: Better Health and Well-Being

7.13.27 The Project's TA (Application Document 7.9) provides details of how the Project would reduce congestion and improve journey time reliability on many parts of the road network in the Lower Thames area to enable economic growth, in compliance with the stated outcomes.

7.13.28 In terms of safety (outcome 3) the TA (Application Document 7.9) identifies that the number of traffic accidents per vehicle kilometre travelled would decrease (Table 9.6, TA (Application Document 7.9)).

7.13.29 On the environment (outcome 4) these impacts are addressed in ES Chapters 6, 8, 9 and 15 (cultural heritage, terrestrial biodiversity, marine biodiversity and climate respectively) (Application Document 6.1). The overarching conclusion is that, while there would be acknowledged impacts, when taking into account the range of environmental commitments included as part of the DCO application and the proposed development design, mitigation and compensation measures, these would minimise impacts upon biodiversity and would deliver significant benefits in the longer term, in accordance with the NPSNN.

7.13.30 In terms of Outcome 5, the Project aims to be accessible to all, particularly through improved connectivity and accessibility for WCH via the creation of new and improved PRoWs, both within the county and throughout the Project route.

7.13.31 Appendix C to this Planning Statement contains a detailed assessment of the Project against the following policies of the Kent Transport Plan 4 (2016-2031):

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a. Outcome 1: Economic Growth and Minimised Congestion

b. Outcome 3: Safer Travel

c. Outcome 4: Enhanced Environment

d. Outcome 5: Better Health and Wellbeing

e. New Lower Thames Crossing

Thurrock Council

7.13.32 The Thurrock Core Strategy and Policies for the Management of Development document was adopted in January 2015. A review of the strategy commenced with a Stage 1 Issues & Options consultation in February 2016 followed by a Stage 2 Issues & Options consultation in December 2018. As issues and options consultations do not contain any firm development proposals or policies reliance is placed here on the adopted LDF.

7.13.33 Thurrock Council is host authority for those parts of the Project immediately to the north of the River Thames. It hosts the North Portal and new recreational site to be created at Tilbury Fields, construction compounds and the Project road and associated works running north, west then north again to major new junctions with the A13 / A1089 etc then west and north to the council boundary close to the M25.

7.13.34 The Adopted Core Strategy and Policies for Management of Development (2015) includes a number of detailed environmental policies of relevance to the Project.

7.13.35 Aside from that part of the Project in a tunnel, the entirety of the Project in the Thurrock Council area lies within land designated as Green Belt.

7.13.36 The Core Strategy contains specific policy guidance on development within the Green Belt. Policy CSSP4: Sustainable Green Belt and PMD6: Development in the Green Belt provide a protective policy stance on development within the Green Belt, in line with national policy. Chapter 5 and Appendix E of this Statement has demonstrated the 'very special circumstances' which justify the Project's location within the Green Belt. In terms of enhancements sought by both policies, the Project proposes four green bridges at Muckingford Road, Hoford Road, Green Lane and North Road, designed to be multi-functional, reducing severance for ecology and providing a better experience for walkers, cyclists and horse-riders (WCHs).

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7.13.37 A Green Infrastructure Study comprises Appendix H to this Planning Statement. It provides the 'bigger picture' for the delivery of large-scale Green Infrastructure as part of the Project. This includes the creation of a network of green infrastructure, reconnecting broken links, the creation of the Mardyke wetland and WCH tracks within the area, with improved access to this fenland landscape from both the southern and western ends of the Ockendon link. This supports the management and enhancement of Greengrid within Thurrock in line with Policy CSSP5: Sustainable Greengrid for delivering the Council's Greengrid Strategy and Policy CSTP18: Green Infrastructure in ensuring a net gain in Green Infrastructure.

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7.13.38 In addressing the adverse effects of the Project on existing WCH routes and networks, improved links are proposed at Muckingford Road, Stifford Clays Road, the A1013 and Rectory Road, North Road, along with Fenland Access, in line with Policy CSTP15: Transport in Greater Thurrock, requiring the development and improvement of such routes.

7.13.39 In terms of open space provision, the Ron Evans Memorial Field and two areas of common land at Tilbury Green and Orsett Fen are permanently impacted by the Project. As the existing provision is not considered to be surplus to requirements, it would be replaced in accordance with the requirements of the NPSNN which would also ensure the Project is consistent with Policies CSTP20 Open Space and PMD5 Open Spaces, Outdoor Sports and Recreational Facilities, requiring that such facilities are provided and maintained to meet the needs of the local community. Further information is provided in Appendix D of this Planning Statement.

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7.13.40 In line with Policy CSTP3: Gypsies and Travellers, which sets out the standards to be met for new traveller sites, a replacement traveller site has been proposed near the existing site which would be lost as a result of the Project, which is equivalent in terms of size, quality and access arrangements from that at Long Lane. National Highways has worked with the traveller community, and Thurrock Council, in developing the relocation proposals. Clause S11.12 (Gammon Field Travellers' site, Work No.7R) of the Design Principles (Application Document 7.5) secures an indicative plan and sets out further information on how further details would be developed. The final design would be subject to the approval of Thurrock Council (see Schedule 2 of the Draft Development Consent Order).

7.13.41 Policy CSTP11: Health Provision is relevant in the consideration of the impacts of the Project on the Whitecroft Care Home. The Applicant considers that, although the offer to acquire the care home may potentially result in a short-

term temporary loss in bedspaces, it will not result in any permanent change in provision and will not impact on the ability of the Council to meet the totality of the identified need for care home bedspaces identified in the South Essex Housing Needs Assessment in the period to 2040.

7.13.42 Policy CSTP17: Strategic Freight Movement and Access to Ports provides support to the logistics and port sectors and the positive impacts of freight activity in Thurrock and beyond. In line with the policy guidance, the Project would directly improve the operation of the SRN by providing additional highway capacity, reducing traffic on the Dartford Crossing, improving journey times and reducing congestion on this road network. Once operational, the Project would lead to a decrease in the level of Heavy Goods Vehicles (HGVs) using the Dartford Crossing, though in combination, flows for both crossings in the opening year, 2030 and in 2045 are forecast to result in a significant increase in total HGV flows.

7.13.43 In relation to terrestrial ecology and biodiversity the Project would impact on the Local Wildlife Site (LWS) at Low Street Pit, Blackshots Nature Area, Rainbow Shaw and Mardyke and Tilbury Main. Policy PMD7: Biodiversity, Geological Conservation and Development requires development proposals to retain and enhance any significant biodiversity habitat or geological interest of recognised local value on site, though states that where this is not possible there should be no overall net loss of biodiversity habitat or features of geological conservation interest in Thurrock. Proposed enhancements include habitat creation to the north of the River Thames, including the enhancement of watercourses within the vicinity of the Mardyke and the creation of four green bridges at Muckingford Road, Hoford Road, Green Lane and North Road.

7.13.44 Policy CSTP19 Biodiversity Development seeks to encourage development proposals to include measures to contribute positively to the overall biodiversity in the Borough. Proposed enhancements include habitat creation to the north of the River Thames, the enhancement of watercourses within the vicinity of the Mardyke and the creation of four green bridges at Muckingford Road, Hoford Road, Green Lane and North Road.

7.13.45 A Flood Risk Assessment (FRA) (ES Appendix 14.6 (Application Document 6.3)) has identified that the majority of the Project route lies in an area of low probability of river and sea flooding (Flood Zone 1), with parts of the route in Flood Zone 3 (high probability of river and sea flooding). For areas of the Project that lie in Flood Zone 3, these benefit from existing flood defences adjacent to the River Thames and near to the Mardyke. In compliance with Policy CSTP27: Management and Reduction of Flood Risk and Policy PMD15: Flood Risk Assessment requiring the appropriate assessments to be undertaken in support of development proposals, the FRA for the Project provides the necessary evidence to satisfy the Exception Test for those areas of the route within Flood Zone 3.

7.13.46 Incorporation of a suite of flood alleviation measures to prevent increases in flood risk elsewhere, include the provision of compensation storage for any permanent losses of floodplain storage volume associated with the West Tilbury Main, Mardyke and Mardyke West tributary in compliance with the Policy provisions.

7.13.47 Policy PMD4: Historic Environment states that the fabric and setting of heritage assets, including listed buildings, conservation areas, scheduled monuments and other important archaeological sites, and historic landscape features should be appropriately protected and enhanced in accordance with their significance. The Policy also states that the approach set out in the NPPF in the determination of applications affecting Thurrock's built or archaeological heritage assets will be followed.

7.13.48 The Project would involve the demolition of three Grade II Listed Buildings at No. 1 and No. 2 Grays Corner Cottages, Thatched Cottage and Murrells Cottages and permanent construction impacts to the Orsett Crop Mark Complex Scheduled Monument which would result in substantial harm to these heritage assets.

7.13.49 Mitigation of the permanent physical impact of construction activity on the Scheduled Orsett Cropmark complex is proposed by means of archaeological excavation and recording of the affected scheduled area, although the scale of impact, even after mitigation, would have a large adverse effect.

7.13.50 The loss of three Grade II Listed Buildings at Nos. 1 and 2 Grays Corner Cottages, Thatched Cottage, and Murrells Cottages would be mitigated by way of building recording, although, given the removal of these heritage assets, mitigation would not fully address the impacts.

7.13.51 For each of the designated heritage assets, physical impacts cannot be avoided, either directly as a result of the route alignment and the scale of the works proposed in the case of the Scheduled Orsett Crop Mark Complex, the Grade II Listed Buildings at Nos. 1 and 2 Grays Corner Cottages and Murrells Cottages. Thatched Cottage lies within an associated earthworks area as well as being in close proximity to the major work associated with the Project route.

7.13.52 In line with Policy PMD4 and its reference to the NPPF, paragraph 195 of that document states that where a development leads to substantial harm to (or total loss of significance of) a designated heritage asset, consent should be refused, unless the substantial harm or total loss is necessary to achieve substantial public benefits outweighing that harm or loss. Chapter 5 of this Planning Statement provides a detailed account of the options and alternatives considered as the Project evolved. In Chapter 6 there is an assessment of the effect of the Project on the historic environment. Further detail of that assessment can be found in the ES Chapter 6 Cultural Heritage (Application Document 6.1). Finally, where there is an unavoidable loss of heritage assets the Need for Project (Application Document 7.1) has set out the overriding need and benefits of the Project in the public interest.

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7.13.53 Appendix C to this Planning Statement contains a detailed assessment of the Project against the following Thurrock Council policies contained in the Thurrock Core Strategy and Policies for Management of Development (as amended) January 2015:

Deleted: Appendix C

a. Policy CSSP4: Sustainable Green Belt (part)

b. Policy CSSP5: Sustainable Greengrid (part)

c. Policy CSTP11: Health Provision (part)

d. Policy CSTP15: Transport in Greater Thurrock (part)
e. Policy CSTP16: National and Regional Transport Networks (part)
f. Policy CSTP17: Strategic Freight Movements and Access to Ports (part)
g. Policy CSTP18: Gren Infrastructure (part)
h. Policy CSTP19: Biodiversity (part)
i. Policy CSTP20: Open Space (part)
j. Policy CSTP21: Productive Land (part)
k. Policy CSTP23: Thurrock Character and Distinctiveness
l. Policy CSTP24: Heritage Assets and the Historic Environment (part)
m. Policy CSTP25: Addressing Climate Change (part)
n. Policy CSTP26: Renewable or Low-Carbon Energy Generation (part)
o. Policy CSTP27: Management and Reduction of Flood Risk (part)
p. Policy CSTP28: River Thames
q. Policy CSTP29: Waste Strategy (part)
r. Policy CSTP32: Safeguarding Mineral Resources (part)
s. Policy PMD1: Minimising Pollution and Impacts on Amenity (part)
t. Policy PMD2: Design & Layout (part)
u. Policy PMD4: Historic Environment (part)
v. Policy PMD5: Open Spaces, Outdoor Sports and Recreational Facilities (part)
w. Policy PMD6: Development in the Green Belt (part)
x. Policy PMD7: Biodiversity, Geological Conservation and Development
y. Policy PMD9: Road Network Hierarchy (part)
z. Policy PMD10: Transport Assessments and Travel Plans (part)
aa. Policy PMD14: Carbon Neutral Development
bb. Policy PMD15: Flood Risk Assessment (part)

7.13.54 Thurrock Council has issued a number of iterations of Issues & Options consultation documents in 2016 and 2018 and has recently (6 December 2023) secured a Council resolution to undergo a further Local Plan; Initial Proposals consultation. However, as Regulation 18 consultations, each of these consultation documents do not contain firm proposals and are at such an early

stage in the preparation of a replacement Thurrock Local Plan that they can be afforded little, if any, weight in the decision-making process.

Brentwood Borough Council

7.13.55 The Brentwood Local Plan 2016-2033 was adopted in March 2022.

7.13.56 Within Brentwood, the Project mainly relates to improvements to M25 junction 29 and therefore the relevant policy framework is confined to the following key policy areas.

7.13.57 Policy BE12: Mitigating the Transport Impacts of Development requires that planning permission will not be granted where there are unacceptable impacts on the transport system which cannot be mitigated. The Transport Assessment (Application Document 7.9) has demonstrated that there would be no unacceptable detrimental impacts on the transport system arising from the Project.

7.13.58 Policy NE01: Protecting and Enhancing the Natural Environment states that existing natural features should be retained as part of development proposals, with new landscape works required to enhance any new development and, wherever possible, incorporate measures to secure a net gain in biodiversity. Brentwood Wooded Hills within the Thames Chase Community Forest is identified as being of high landscape value and is affected by the Project, mainly as a result of utility diversions resulting from proposed improvements to the M25, though no significant effects are predicted to this protected landscape. Mitigation including habitat creation and the improvement and enhancement of the Thames Chase Community Forest are proposed in accordance with the Policy provisions.

7.13.59 The effects of the project from nitrogen deposition at Codham Hall local wildlife site is addressed through the provision of site to compensate for the effect of nitrogen deposition at Hole Farm where a programme of natural environmental enhancement alongside essential mitigation is proposed.

7.13.60 In terms of biodiversity net gain, ES Appendix 8.21: Biodiversity Metric Calculations (Application Document 6.3) presents the results of the biodiversity metric assessment for the Project. Although the construction of the Project would have unavoidable significant adverse effects on a Site of Special Scientific Interest and irreplaceable habitats, such as veteran trees and ancient woodland, it has sought to increase biodiversity value wherever possible within its landscape design.

7.13.61 Policy NE04: Thames Chase Community Forest dictates that development proposals which fall within the Community Forest area should not prejudice the implementation, aims and objectives of the Thames Chase Plan. Although the Project would not have a significant impact on Brentwood Wooded Hills and therefore mitigation has not been considered, embedded mitigation to the Thames Chase Community Forest is nonetheless proposed in line with Policy.

7.13.62 The guidance in Policy MG02: Green Belt that planning permission will not be granted in the Green Belt except in 'very special circumstances', has been responded to in full in Appendix E: Green Belt of this Planning Statement, where a justification, based on the defined and over-riding need for the Project, no viable alternatives, policy support and temporary impacts has been set out.

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7.13.63 Appendix C to this Planning Statement contains a detailed assessment of the Project against the following Brentwood Borough Council policies contained in the recently adopted Brentwood Local Plan 2016-2033:

Deleted: Appendix C

a. Policy MG02: Green Belt (part)
b. Policy MG06: Local Plan Review and Update (part)
c. Policy BE01: Carbon Reduction and Renewable Energy
d. Policy BE02: Water Efficiency and Management (part)
e. Policy BE05: Sustainable Drainage (part)
f. Policy BE09: Sustainable Means of Travel and Walkable Streets (part)
g. Policy BE10: Sustainable Passenger Transport (part)
h. Policy BE11: Electric and Low Emission Vehicles
i. Policy BE12: Mitigating the Transport Impacts of Development
j. Policy BE14: Creating Successful Places (part)
k. Policy BE16: Conservation and Enhancement of Historic Environment
l. Policy NE01: Protecting and Enhancing the Natural Environment (part)
m. Policy NE02: Green and Blue Infrastructure
n. Policy NE03: Trees, Woodlands and Hedgerows
o. Policy NE04: Thames Chase Community Forest
p. Policy NE08: Air Quality
q. Policy NE09: Flood Risk (part)
r. Policy NE10: Contaminated Land and Hazardous Substances (part)
s. Policy NE11: Floodlighting and Illumination
t. Policy E11: Brentwood Enterprise Park

Essex County Council

7.13.64 Essex County Council is the statutory Minerals & Waste Planning Authority and also the Highway Authority for that part of the Project which sites within the county of Essex. Accordingly, the relevant planning documents to be considered are the following:

a. Essex Minerals Local Plan
b. Essex and Southend-on-Sea Waste Local Plan
c. Essex Transport Strategy: The Local Transport Plan for Essex

7.13.65 The Essex Minerals Local Plan was adopted in July 2014. It is in the process of being reviewed though no firm proposals have yet been finalised in term of that review.

7.13.66 The Essex and Southend-on-Sea Waste Local Plan was adopted in July 2017 and the Local Transport Plan in June 2011.

Essex Minerals Local Plan (July 2017)

7.13.67 In response to Policy S8 – Safeguarding mineral resources and mineral reserves, which seeks to safeguard mineral resources within Mineral Safeguarding Areas (MSAs), the findings of the Mineral Safeguarding Assessment Report (Application Document 6.3, ES Appendix 11.2) recommend that no mineral resources should be extracted from MSAs within the county as the two sites identified are considered to be unviable or uneconomically viable to extract.

7.13.68 Appendix C to this Planning Statement contains a detailed assessment of the Project against the following Essex Minerals Local Plan policies:

Deleted: Appendix C

a. Policy S2: Strategic priorities for minerals development (part)

b. Policy S4: Reducing the use of mineral resources

c. Policy S8: Safeguarding mineral resources and mineral reserves

Essex and Southend-on-Sea Waste Local Plan (July 2017)

7.13.69 In respect of Policy 2: Safeguarding waste management sites and infrastructure, which seeks to protect and safeguard waste management sites and infrastructure from adverse impacts from non-waste development, Chapter 11: Material Assets and Waste, of the ES (Application Document 6.1) explains how construction and operational waste from the Project would be managed. The waste arrangements proposed for the construction and operational phases of the Project are detailed in Appendix 11.5: Waste Assessment Supporting Data (Application Document 6.3). The evidence demonstrates that there would not be an adverse impact from the Project on waste sites and infrastructure in the Essex.

7.13.70 Appendix C to this Planning Statement contains a detailed assessment of the Project against Policy 2: Safeguarding Waste Management Sites and Infrastructure, in the Essex and Southend-on-Sea Waste Local Plan.

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Essex Transport Strategy: The Local Transport Plan for Essex (June 2011)

7.13.71 In respect of Policy 5: Connectivity, which seeks to strengthen transport networks to support a vibrant, successful and sustainable future for Essex and Policy 6: Freight Movement on managing the efficient movement of freight within the county, details are provided within the Transport Assessment (TA) (Application Document 7.9). The Project has been designed to comply with the design standards in the Design Manual for Roads and Bridges (DMRB). The standards used define the horizontal and vertical alignment of the road and its cross-sections, junction layouts and road type (including the number of lanes). The standards determine the design of highway structures including the tunnel and geotechnics and earthworks. They also define the requirements for drainage, lighting, road signs and markings, traffic control technology and

provision for non-motorised users such as pedestrians, cyclists and horse riders.

7.13.72 The preliminary design has been subject to a stage 1 road safety audit (RSA). The RSA for the Project was carried out by an independent road safety audit team in accordance with the DMRB which aim to ensure the safe operation of the Project road and reducing the incidence and severity of road traffic collisions on roads in Essex in compliance with Policy 10: Road Safety. In relation to Policy 15: Walking and Public Rights of Way seeking the promotion of walking and the use of PRoWs, the Project aims to be accessible to all, particularly through improved connectivity and accessibility for WCH via the creation of new and improved PRoWs and bridleways in line with Policy.

7.13.73 Appendix C to this Planning Statement contains a detailed assessment of the Project against the following policies contained in the Local Transport Plan for Essex:

Deleted: Appendix C

a. Policy 4: Public Transport
b. Policy 5: Connectivity
c. Policy 6: Freight Movement
d. Policy 7: Carbon Reduction
e. Policy 8: Promoting Sustainable Travel Choices
f. Policy 9: The Natural, Historic and Built Environment
g. Policy 10: Road Safety
h. Policy 14: Cycling
i. Policy 15: Walking and Public Rights of Way

London Borough of Havering

7.13.74 The Havering Local Plan 2016-2031 was adopted in November 2021

7.13.75 The primary considerations within the Adopted Local Plan of relevance to the Project relate to the Green Belt, recreation and leisure, minerals extraction, biodiversity and geodiversity, heritage, and trees and woodland.

7.13.76 The local plan does not contain a bespoke policy on the protection of the Green Belt although its protection is clearly a key feature of the local plan strategy as a whole. Appendix E to this Planning Statement contains a detailed assessment of the 'very special circumstances' justifying the Project within the Green Belt.

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7.13.77 There are no statutorily designated sites of nature conservation interest directly affected by the Project within the Borough, although there would be moderate adverse significant effects on Codham Hall Wood (LWS) and ancient semi-natural woodland, the ancient woodland west of M25 junction 29 and a negligible risk to Cranham Marsh LNR following mitigation. Effects of changes in nitrogen deposition will result in significant effects on Codham Hall Wood LWS and Ancient Woodland (AW), Ockendon Railsides SINC and an unnamed Ancient Woodland block. Policy 30: Biodiversity and Geodiversity is primarily concerned with the protection and enhancement of priority habitats, species

and sites. In terms of biodiversity net gain, ES Appendix 8.21: Biodiversity Metric Calculations presents the results of the Biodiversity Metric calculations to support the ES (Application Document 6.3). Although the construction of the Project would have unavoidable significant adverse effects on a Site of Special Scientific Interest and irreplaceable habitats, such as veteran trees and ancient woodland, it has sought to increase biodiversity value wherever possible within its landscape design.

7.13.78 Policy 28: Heritage Assets requires all new development affecting sites, buildings, townscapes and landscapes of special architectural, historical or archaeological importance to preserve or enhance their character or appearance. The Grade I Listed churchyard of St Mary Magdalene in North Ockendon lies in close proximity to construction works outside the Order Limits and may result in temporary changes to its setting through construction activity which is not inconsistent with this Policy.

7.13.79 Policy 27: Landscaping seeks to maximise opportunities for the greening of the borough through the planting of trees and other soft landscaping.

7.13.80 Policy 29: Green Infrastructure requires developers to work with existing partnerships to support and enhance green infrastructure provision including the Thames Chase Community Forest.

7.13.81 The Project would involve the removal of trees within the Thames Chase priority area, along with blocks of ancient woodland further north around junction 29 of the M25 and A127 either side of the M25. In total, the Project would result in the loss of 7.36ha of ancient woodland, 5.35ha of ancient woodland to the south of the River Thames and 2.01ha of ancient woodland to the north of the River Thames. To compensate for the loss of this woodland, 80.75ha of woodland would be planted (Application Document 6.2, ES Figure 2.4: Environmental Masterplan).

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7.13.82 The Project involves the acquisition of land for the proposed highway alignment at the eastern boundary of Thames Chase to be replaced with an area to the south of Thames Chase. The replacement land would be designed to match the existing Thames Chases Community Forest characteristics.

7.13.83 Land is also required during the construction phase at Folkes Lane Woodland (which forms part of the Thames Chase Community Forest) as part of the widening of the M25 and the provision of a footbridge over the M25 to reconnect the Thames Chase Community Centre to the Land of the Fanns project. A permanent easement would also be required at Folkes Lane for which replacement land is to be provided. The impacts on these two open space sites are considered in detailed in Appendix D to this Planning Statement.

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7.13.84 Proposals also include connecting the Ockendon Link and improved WCH routes to complement the Thames Chase Plan, along with improved access through enhancements to the ‘Forest circle’ and the creation of interconnected ‘Greenway routes’ through and around the Thames Chase area. These proposals demonstrate compliance with Policies 27 and 29.

7.13.85 Policy 37, Mineral Reserves, seeks to safeguard mineral reserves in the borough from forms of development that would sterilise the resource and/or prejudice future mineral extraction unless a number of considerations apply

(including where it is not practical or economically viable to extract the minerals prior to development taking place. A Mineral Safeguarding Assessment Report has been prepared (Application Document 6.3, ES Appendix 11.2) in support of this Application and has identified the opportunity for the prior extraction of mineral resources, although has determined this to be unfeasible due either to adverse impacts or being economically unviable.

7.13.86 Appendix C to this Planning Statement contains a detailed assessment of the Project against the following policies contained in the recently adopted Havering Local Plan 2016-2031:

Deleted: Appendix C

a. Policy 12: Healthy Communities (part)
b. Policy 18: Open Space, Sports and Recreation (part)
c. Policy 22: Skills and Training
d. Policy 23: Transport Connections (part)
e. Policy 26: Urban Design
f. Policy 27: Landscaping
g. Policy 28: Heritage Assets
h. Policy 29: Green Infrastructure
i. Policy 30: Biodiversity and Geodiversity
j. Policy 31: Rivers and River Corridors (part)
k. Policy 32: Flood Management
l. Policy 33: Air Quality
m. Policy 34: Managing Pollution
n. Policy 35: On-site Waste Management
o. Policy 36: Low-carbon Design and Renewable Energy (part)
p. Policy 37: Mineral Reserves
q. Policy 38: Mineral Extraction (part)

Greater London Authority

The London Plan 2019 to 2041 (Adopted March 2021)

7.13.87 The Adopted London Plan provides a strategic planning framework for Greater London for the next 20 to 25 years. Policy SD2 'Collaboration in the Wider South East' refers to the Mayor's partnership working across the Wider South East (WSE) to address appropriate regional and sub-regional challenges and opportunities through recently-developed strategic coordination arrangements. This includes a list of 13 WSE Strategic Infrastructure Priorities, including Lower Thames Crossing that have been endorsed by the WSE partners for initial delivery.

7.13.88 The main policy provisions of relevance to the Project, namely Policy SI12 'Flood risk management', Policy T4 'Assessing and mitigating transport impacts' and Policy T7 'Deliveries, servicing and construction' remain unchanged from the previous London Plan and align with that provided by London Borough of Havering, addressed above.

7.13.89 Appendix C to this Planning Statement contains a detailed assessment of the Project against the following policies contained in the adopted London Plan:

Deleted: Appendix C

a. Policy GG1: Building strong and inclusive communities (part)
b. Policy GG5: Growing a good economy (part)
c. Policy SD2: Collaboration in the Wider South East
d. Policy SD3: Growth locations in the Wider South East and beyond
e. Policy D14: Noise (part)
f. Policy S5: Sports and recreational facilities (part)
g. Policy E11: Skills and opportunities for all (part)
h. Policy HC1: Heritage conservation and growth (part)
i. Policy G1: Green Infrastructure
j. Policy G2: London's Green Belt
k. Policy G4: Open Space (part)
l. Policy G5: Urban Greening (part)
m. Policy G6: Biodiversity and access to nature (part)
n. Policy G7: Trees and woodlands (part)
o. Policy SI1: Improving air quality (part)
p. Policy SI2: Minimising greenhouse gas emissions (part)
q. Policy SI5: Water infrastructure (part)
r. Policy SI7: Reducing waste and supporting the circular economy (part)
s. Policy SI10: Aggregates (part)
t. Policy SI12: Flood risk management (part)
u. Policy SI13: Sustainable drainage (part)
v. Policy T4: Assessing and mitigating transport impacts
w. Policy T5: Cycling (part)
x. Policy T7: Deliveries, servicing and construction (part)

Mayor's Transport Strategy (2018)

7.13.90 The Lower Thames Crossing is included in a list of '*Strategic Infrastructure priorities'* within the Mayor's Transport Strategy. Cross-cutting Policy 8 seeks the protection, promotion and enhancement of green infrastructure and cultural heritage assets affected by transport development. These policy issues have been fully addressed within the planning responses to equivalent policies contained in the respect of the Havering Local Plan above.

7.13.91 Appendix C to this Planning Statement contains a detailed assessment of the Project against the following policies contained in the Mayor's Transport Strategy:

Deleted: Appendix C

a. Policy 6: Reducing harmful pollution from road transport

b. Policy 7: Achieving a zero carbon city and good air quality

c. Policy 8: Natural and Built Environment and Climate Resilience

The Joint Waste Development Plan for the East London Waste Authority Boroughs (2012)

7.13.92 Policy W1: Sustainable Waste Management, is of relevance to the Project providing detailed guidance on a number of aspects of sustainable waste management. In compliance with the policy, the Project has demonstrated the implementation of the waste hierarchy in dealing with waste arisings, with details provided on how the Project would minimise the production of construction, demolition and excavation waste and the management of this.

7.13.93 Appendix C to this Planning Statement contains a detailed assessment of the Project against the following policies contained in the Joint Waste Development Plan for the East London Waste Authority Boroughs:

Deleted: Appendix C

d. Policy W1: Sustainable Waste Management (part)

7.14 Other major developments

7.14.1 Application Document 7.17: Interrelationship with other Nationally Significant Infrastructure Projects and Major Development Schemes identifies ten major development proposals with which there is the potential for the Project to interface.

7.14.2 The ten projects identified are as follows:

a. The London Resort

b. Tilbury2

c. Thurrock Flexible Generation Plant

d. Thames Freeport

e. Tilbury Link Road

f. East Anglia Green

g. DP World London Gateway

h. Brentwood Enterprise Park

i. Hole Farm Community Woodland

j. M25 junction 28

7.14.3 The document describes interfaces between the Project and other NSIPs and major development schemes nearby as well as how National Highways has worked with third-party project promoters to design out and control them, where necessary, to avoid prejudicing the successful delivery of other projects in the region. It describes the work undertaken to ensure proposals are designed, consented, and delivered in a coordinated way to support the Government's vision for the Lower Thames area and beyond

7.14.4 In addition to these ten major projects, the Applicant undertakes fortnightly monitoring of planning applications in proximity to the Order Limits in order to protect its interests in terms of the future delivery of the Project and ensure that applicants and potential developers are aware that a DCO application for the Project is forthcoming. In the period since October 2017 when this monitoring commenced, 30 planning applications have been identified on the grounds that they could prejudice the delivery of the Project. National Highways made representations on these applications as appropriate and the majority have now been determined by the relevant local planning authority. Those which are still pending, where the Applicant is still in discussion with the relevant local authority or applicant or where a decision has not yet been made on the application, are summarised in Table 7.3. These are primarily recent applications submitted to the relevant local planning authority during 2022.

Table 7.3 Planning applications where decisions are still pending

Application Reference	Local Planning Authority	Project Description	Location	Date	Comment
22/00402/FUL	Brentwood	Hybrid application seeking outline planning permission for M25 to B186 link Road (Phase 2) and detailed planning permission for demolition of existing buildings and structures; ground works to enable creation of development plots; highways works including construction of new A127 overbridge, access from B186, site roads and construction of M25 J29 to B186 link road (Phase 1); erection of buildings for Class B8 (storage & Distribution) and/or Class B2 (general Industrial) use, with ancillary office space (within Class E); landscaping; infrastructure and enabling works including diversion of public rights of way.	Land South Of A127 East Of M25 junction 29, Codham Hall, Codham Hall Lane, Great Warley, Essex	11-Mar-22	National Highways yet to submit a final response to the application. Engagement between the Project team and St Modwen is ongoing. The application is undecided.
22/00587/FUL	Brentwood	Application seeking full planning permission for engineering works on land situated to the south of Brentwood Enterprise Park, west of the B186 (Warley Street), north of the railway line and east of the M25 Motorway. Works to comprise the stripping and storage of topsoil, the movement, spreading and compacting of earthworks material from the adjacent Brentwood Enterprise Park development, and the respreading and levelling of the stored topsoil.	Land Opposite Upminster Trading Park, Warley Street, Great Warley, Essex	19-Apr-22	No objection submitted – engagement with St Modwen is ongoing and legal agreement is being sought. The application is undecided.

7.15 Summary and conclusion

7.15.1 This chapter of the Planning Statement has provided a summary of the 'other matters' that the decision maker may consider are both important and relevant in the determination of this DCO application in accordance with Section 104(2)(aa) and (d) of the 2008 Act. It has included consideration of the following:

a. the Ports NPS

b. the NPPF and planning practice guidance

c. Marine plans

d. Road Investment Strategy 2

e. Union Connectivity Review

f. Levelling Up the UK White Paper

g. National Infrastructure Strategy

h. Build Back Better Policy Paper

i. Second National Infrastructure Assessment Baseline Report

j. local plan, minerals, waste and transport policies for each of the 'host' local authorities

k. Supplementary planning documents

l. Major developments

7.15.2 It has considered the extent to which these 'other matters' may be both 'important and relevant' to the decision. This chapter has identified where the policies explicitly support the development of the Project, and has also considered potentially relevant policies.

7.15.3 In respect of development plan policy, it is considered that the Project is generally consistent with the local policy framework at local authority level. In the limited cases where residual adverse effects arise, these are in the same policy areas which arise in respect of the NPSs, which are the primary consideration in the decision-making process for this Project.

7.15.4 No significant conflicts are identified with any of the 'other matters' identified in this chapter.

8 Planning balance and conclusions

8.1 Introduction

8.1.1 This chapter of the Planning Statement seeks to assist the Examining Authority and the SoS in applying the provisions of the Section 104 (3) of the Planning Act 2008 that requires an application for a DCO to be decided in accordance with any relevant NPS unless one or more of the subsections (4) to (8) of Section 104 apply.

8.1.2 Section 104(2) states that in deciding an application, the SoS must have regard to the following:

a. Any relevant NPSs

b. Any appropriate marine policy documents (if any)

c. Any Local Impact Report (LIR) submitted to the Secretary of State

d. Any matters prescribed in relation to development of the description to which the application relates

e. Any other matters which the SoS thinks are both important and relevant to the SoS's decision

8.1.3 The following NPSs are relevant to the consideration of this DCO application:

a. National Policy Statement for National Networks (NPSNN) which has effect in relation to the highways nationally significant infrastructure proposed

b. Overarching National Policy Statement for Energy (NPS EN-1), National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (NPS EN-4) and National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) which have effect in relation to the works which comprise four energy NSIPs (one overhead line NSIP and three gas pipeline NSIPs).

c. Insofar as they may or may not be relevant to the Project, the draft revisions and revised draft revisions to NPS EN-1, EN-4 and EN-5 and the draft revision to the NPSNN are also a consideration.

8.1.4 A draft revision to the NPSNN was published in March 2023. The Applicant has submitted its assessment of the status and weight to be attached to this draft NPS in its Policy accordance assessment of the Project against the Consultation draft NPSNN (published March 2023) [**REP4-209**].

8.1.5 In November 2023 the Government issued the final revised versions of the three Energy NPSs referred to above. The Applicant has submitted a commentary on the weight to be afforded the final versions of these NPSs in its Deadline 9 submission Applicant's response to ExA ISH 12 AP23 on Suite of Energy National Policy Statements [**Document Reference 9.211**].The analysis of relevant planning policy and other relevant and important matters in the previous chapters of this Planning Statement have demonstrated the Project's accordance with NPS policy and compliance with other relevant considerations.

8.1.6 Chapter 4 of this Planning Statement provides a summary of the need case for the Project which is addressed in full in Application Document 7.1: The Need for the Project. This is set in the context of Government's policy on the need for the development of the national networks established in section 2 of the NPSNN.

8.1.7 That policy context recognises the '*critical need to improve the national networks to address road congestion*' and the need for *'resilient networks that better support social and economic activity and to provide a transport network that is capable of stimulating and supporting economic growth'* (paragraph 2.2 of the NPSNN). Paragraph 2.16 of the NPSNN identifies the negative impacts of traffic congestion on economic activity, on the environment and on road users. Paragraph 2.187 of the NPSNN identifies the '*significant pressure'* that the road network is already under and that this is forecast to increase (paragraph 2.18).

8.1.8 Accordingly, the NPSNN establishes, at paragraph 4.2:

> '…a presumption in favour of granting development consent for national networks NSIPs that fall within the need for infrastructure established in this NPS.'

8.1.9 At paragraph 4.3 of the NPSNN, decision makers are advised to take into account both the potential benefits of any proposed development and any potential adverse impacts.

8.1.10 In making the case for the development, not only in Chapter 4 but throughout this Planning Statement, support has been drawn from the extensive and comprehensive evidence base which has been prepared in support of the DCO application. This includes the detailed chapters of the ES (Application Document 6.1) but also the HRA (Application Document 6.5) and the wealth of other transport, traffic, design, sustainability, health, equalities, economic, environmental, construction, implementation and other reports which support this Application.

8.1.11 Chapter 5 of the Planning Statement has described the alternatives considered as part of the process of designing the Project and how that design has evolved over time, not only in response to technical matters (including those identified in the ES (Application Document 6.1) but also in response to consultation and engagement with statutory undertakers, key stakeholders and the local community as described in Application Documents 5.1: Consultation Report and 5.2: Statement of Engagement.

8.1.12 Chapter 6 of this Planning Statement and supported by the NPS accordance tables at Appendices Appendix A and Appendix B, has considered all relevant sections and paragraphs of all NPSs which relate to the Project (described at paragraph 7.1.3 above) and has identified both potential benefits and potential adverse effects of both the construction and operation of the Project. Chapter 6 is also supported by Appendices Appendix D to Appendix G which address accordance with the NPS requirements in respect of open space, green infrastructure, Green Belt, AONB and private recreation facilities.

8.1.13 Chapter 7 has addressed the 'other matters' which are considered to have the potential to be both important and relevant to the Project. This has included:

a. The National Policy Statement for Ports

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b. The National Planning Policy Framework / National Planning Practice Guidance

c. Marine Plans

d. Government's Road Investment Strategy 2

e. The Union Connectivity Review

f. Levelling Up the UK White Paper

g. National Infrastructure Strategy 2020

h. Build Back Better Policy Paper

i. Second National Infrastructure Assessment Baseline Report 2021

j. Host authority development plan and other relevant local policy (supported by a more detailed assessment in Appendix C of this Planning Statement

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k. Other major developments

8.1.14 This final chapter of the Planning Statement draws these matters together in the form of a planning balance and overall conclusion regarding accordance with the relevant NPSs and other important and relevant considerations. Before arriving at that balance it is necessary to consider the need for the Project and the process of considering reasonable alternatives. Finally, there is a need to weigh the potential benefits and opportunities the Project would deliver against any potential adverse impacts in the context provided by the policy and other considerations identified above.

8.2 The Need for the Project

8.2.1 The Need for the Project is presented in detail in Application Document 7.1 and is summarised in Chapter 4 of the Planning Statement.

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8.2.2 The Dartford Crossing, the only road crossing of the River Thames east of London, is both a critical part of the country's road network and a critical component in the UK's economic infrastructure. It connects local and regional businesses and provides a vital link between the Channel Ports, London and the rest of the UK. However, the congested nature of the Dartford Crossing means that there is a local, regional and national economic need for an additional crossing.

8.2.3 The incremental approach to increasing traffic capacity at the existing Dartford Crossing has resulted in sub-optimal configuration with many compromises compared to modern standards. Operational restrictions in terms of the need for escorts for dangerous goods vehicles (DGVs) (c2,000 each month) and the closure of the southbound bridge during periods of excessive winds cause further operational and safety issues and delays.

8.2.4 Poor transport connectivity across the River Thames in view of these restrictions at the Dartford Crossing effectively severs the economies north and south of the river. This congestion has combined with other factors such as low

educational attainment, low skill levels and pockets of deprivation to damage the area's overall competitiveness.

8.2.5 The lack of capacity across the River Thames and the congestion at the Dartford Crossing threaten to weaken the UK's international competitiveness, increasingly disrupt trade flows, stifle employment growth and hamper efforts to raise national productivity levels. In this regard there is a clear economic need for the Project.

8.2.6 However, there is not only an economic need. There is a traffic / transport need and an environmental and a social need to address these major problems at the Dartford Crossing. Traffic congestion on the Dartford Crossing means that a free-flowing journey from M25 junction 2 to junction 30 should take about four minutes and 30 seconds. The LTAM 2016 base year (see Application Document 7.9: Transport Assessment) shows that this journey actually takes much longer at about nine minutes during the AM peak. This is double the time that it should take.

8.2.7 The delays described above apply under normal operating conditions. Congestion and delays arising from high volumes of traffic at the Dartford Crossing are made worse when incidents occur. In 2019 the average duration of incidents at the Dartford Crossing was approximately 10 minutes. There are, on average, 10 lane closures each day (in addition to those required for DGV escorts), which impact traffic flows at Dartford Crossing for, on average, over 1.5 hours per day (Highways England, 2019).

8.2.8 Due to the Dartford Crossing frequently operating above capacity, closure in either direction, even for a relatively short time, can lead to significant additional congestion. Traffic congestion of this magnitude results in thousands of lost hours for drivers.

8.2.9 Furthermore, when larger incidents occur, typical operation can take up to five hours to resume. During these incidents, journeys on all roads are disrupted. In the case of a northbound incident, slow-moving traffic can extend back as far as M25 junction 4 (over nine miles) and with a southbound incident, over seven miles to M25 junction 29 (Teletrac, 2014). In the event of closures, there are limited options available to manage the impact. Each response requires time to implement and further reduces the total crossing capacity, leading to substantial delays to users and often causing 'gridlock' on both the surrounding strategic and local highway networks. The safety record on most of the sections of the M25/A282 in the vicinity of the Dartford Crossing is worse than the national average for roads of a similar classification due in part to the high number of incidents at the Dartford Crossing and its approaches.

8.2.10 This not only affects business travel but also the ability for local traffic to cross the River Thames for leisure and other non-business purposes. The LTAM shows that 96% of Dartford Crossing trips have an origin or destination outside the local areas immediately either side of the Dartford Crossing. This demonstrates that the Dartford Crossing has a significant role in providing regional and national connectivity, but also highlights the effects of the poor journey time reliability and network resilience on motorists from the local areas. There is a clear need to make it easier for local residents to make leisure and other non-business trips which would deliver a community benefit.

8.2.11 Finally, there is a transport need. Approximately 18% of the total daily traffic using the Dartford Crossing in 2016 was Heavy Goods Vehicles (HGVs). This is almost double the percentage typically observed on other parts of the Strategic Road Network (SRN), yet again demonstrating business users' reliance on the Dartford Crossing and the economic importance of the crossing for facilitating the movement of goods from Continental Europe.

8.2.12 Historically, traffic levels at the Dartford Crossing were highest in the morning and evening peak periods, with the interpeak period providing an opportunity for the Crossing to recover from traffic backlogs or incidents in the morning peak. However, in recent years, due to peak period congestion, interpeak traffic flows have been increasing and the ability of the interpeak to offer a recovery period has been reducing with knock-on consequences for the afternoon peak.

8.2.13 Furthermore, the average daily traffic flow using the Dartford Crossing without the Lower Thames Crossing is predicted to increase by nearly 21% in the period 2016-2030.

8.2.14 Without additional capacity across the River Thames and greater resilience being built into the SRN at the River Thames, the existing impacts will continue to worsen. This will lead to increased congestion at the Dartford Crossing, on key approach roads such as the A2, M20, A13 and the A127 and, on the local road network in Dartford and Thurrock. Local people's daily routines are impacted, leading to wasted time for people and industry and affecting economic productivity.

8.3 Consideration of Reasonable Alternatives

8.3.1 It is the Applicant's case that this additional capacity and network resilience is best provided in the form of the Project. However, in coming to that view, a large number of alternative options were considered in line with the requirements of paragraphs 3.3, 4.26 and 4.27 of the NPSNN. These options were refined over time to address not only technical, environmental and other matters which came to light as the evidence base for the Project evolved, but also as a result of consultation and engagement with key stakeholders and local communities.

8.3.2 Chapter 5 of this Planning Statement explains the evolution of the Project, the alternative options which were considered (not only for the road itself but the utility diversions, construction compounds and utility logistics hubs and mitigation proposals which also form part of the Project) and the factors which resulted in the Project being considered the preferred option.

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8.3.3 The overall conclusion of Chapter 5 of the Planning Statement is that the Applicant considers that it has taken a robust and comprehensive approach to the assessment of alternatives which accords with the requirements of paragraphs 4.26 and 4.27 of the NPSNN. The preferred option which is the subject of this DCO application represents the optimal solution and the only reasonable alternative to deliver the Scheme Objectives and meet the need for the Project (identified in Table 4.1).

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8.4 Benefits and Opportunities of the Project

8.4.1 Table 4.2 summarises the benefits and opportunities created by the Project under three headings:

a. Economic benefits and opportunities

b. Community and environmental benefits

c. Transport benefits and opportunities

8.4.2 In terms of economic benefits, the Project would deliver the following:

d. Faster and more reliable journeys and improved accessibility would boost the productivity of businesses in the Lower Thames area and wider region

e. Enhanced connectivity and cross-river economic opportunities would further stimulate competition, boosting employment and increasing inward investment

f. Benefits would be greatest for high value businesses, but also significant for the local area's lower value transport and construction sectors

g. Quicker, more reliable access to key markets, resources and labour for the region's ports

8.4.3 Turning to community and environmental benefits, the Project would deliver the following:

a. Improved cross-river local trips to community by way of an additional crossing and less congested Dartford Crossing

b. Reduced congestion in the Dartford area would decrease noise and air pollution

c. Enhanced connectivity and facilities for WCH

d. A positive legacy of green infrastructure and improved biodiversity

e. Improved access to local jobs and upskilling opportunities for local communities

8.4.4 Finally in terms of transport benefits, the Project would deliver the following:

a. Additional road capacity and river crossing east of London, significantly improving road space supply to serve the traffic demand

b. The additional road space would not be challenged by design limitations (e.g. no sub-optimal junction layout, no need for escorting, no wind related concerns, etc.)

c. An alternative crossing option across the river east of London and a more resilient road network in the Lower Thames area

d. Significantly reduced traffic congestion at the Dartford Crossing

e. Many journeys on both sides of the river, as well as those that cross the river, would be quicker

f. The latest safety standards and a decreased accident rate

g. Cross-river journey time reliability would be improved, with less frequent delays and uncertainty

h. Significant benefits to the business transport users wishing to cross the River Thames east of London

8.4.5 As set out in Chapter 4 of this Planning Statement and Need for the Project (Application Document 7.1), a Value for Money assessment has been carried out with respect to the Project. In this regard, account has been taken of Project costs, monetised impacts and benefits and, other qualitative information on impacts and benefits.

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8.4.6 Based on the categories in the Department for Transport's value for money framework, the Project has been assessed as providing 'value for money'. Further details are available in the Appendix D: Economic Appraisal Package of the Combined Modelling and Appraisal Report (Application Document 7.7).

8.4.7 Sensitivity tests have been undertaken to assess the sensitivity of the Project's monetised benefits, costs and revenues to different traffic growth, costs and other scenarios. The results of these tests are that the Adjusted Benefit Cost Ration (BCR) is 1.23 when the appraisal parameters in the forthcoming TAG data book v1.19FC were applied to the appraisal. This rises to 1.66 (Scenario 1) when the appraisal period is extended to 100 years (paragraph 12.3.5 of Appendix D to the ComMA (Application Document 7.7).

8.4.8 Overall, the scheme would deliver significant and wide-ranging benefits which the Applicant considers should carry considerable weight in the planning balance.

8.5 The potential adverse impacts of the Project

8.5.1 The Applicant has taken all reasonable steps to avoid, limit and mitigate potential adverse impacts of the Project. However, even having taken these steps, the construction and operation of the Project also has the potential to result in some adverse impacts. This is inevitable with a project the scale and extent of the Project and it is almost inconceivable that such a project could be delivered without causing some adverse impacts.

8.5.2 Chapter 6 of this Planning Statement provides an assessment of these potential adverse effects of the Project. This analysis follows the assessment principles and generic impacts assessment set out in the NPSNN, the relevant Energy NPSs and national and local policy where relevant.

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8.5.3 Chapter 6 (along with the compliance tables at Appendices Appendix A – Appendix C) demonstrates that the proposed development would not cause any unacceptable adverse effects that, considered individually, cumulatively or as a whole, should mean the decision maker should refuse the application and, moreover, that each aspect of the proposals is acceptable in planning terms when considered against the relevant national and local policies.

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8.6 Other potentially important and relevant matters

8.6.1 In line with provision 104(2) (d) of the 2008 Act Chapter 7 of this Planning Statement considers whether there may be any other matters which may be both important and relevant to the Secretary of State's decision on this DCO application.

8.6.2 These matters are listed at paragraph 7.1.12 of this chapter.

8.6.3 Chapter 7 concludes that the Project is broadly in alignment with these 'other matters'.

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8.6.4 In respect of development plan policy, it is considered that the Project is generally consistent with the local policy framework at local authority level. In the few cases where it is not, the conflicts which arise are broadly the same as those which arise in respect of the NPSs, which are the primary consideration in the decision-making process for this Project. In that regard, any conflicts have to be considered against the benefits which the Project will delivery as set out in detail in other Application Documents.

8.6.5 In view of the primacy of the NPSs, it is the Applicant's view that, in the event that there is a conflict between any 'other matter' and the provisions of an NPS, the NPS prevails for the purposes of decision making given the national importance of NSIPs.

8.7 The Planning Balance and Conclusion

8.7.1 Paragraph 4.3 of the NPSNN sets out that decision makers, when weighing the adverse impacts of proposed development against its benefits, should take into account:

> 'its potential benefits, including the facilitation of economic development, including job creation, housing and environmental improvement, and any long-term or wider benefits;
>
> its potential adverse impacts, including any longer-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts.'

8.7.2 The degree of weight to be afforded the relevant benefits and adverse impacts varies according to the issue being considered.

8.7.3 This Planning Statement has identified the traffic problems arising from the Dartford Crossing, describing the need for the Project in order to increase road capacity and provide additional transport resilience in the south-east of the country. It has highlighted the traffic problems resulting from the Dartford Crossing as the only crossing of the River Thames east of London, with traffic flows that continue to operate above the design capacity of the Dartford Crossing, resulting in frequent congestion and poor journey time reliability, making the Dartford Crossing an unreliable section of the SRN. Delays and poor journey time reliability at the Dartford Crossing and surrounding roads are a major impediment to economic growth in the South East of England.

8.7.4 These problems and the consequent need for the Project are articulated in national and regional strategies, reinforced by the Government's commitment to support the Project through its current road investment programme.

Alternatives

8.7.5 Alternative route options to address these problems have been considered as part of a wide ranging and detailed optioneering exercise resulting in a Preferred Route Announcement in April 2017. The Project has been developed since and through further public consultation and stakeholder engagement, the design of the Project has been developed to that now set out within the DCO application.

8.7.6 The Project has been identified as the best option to meet the defined need and Scheme Objectives, by not only offering an effective solution to the long-standing traffic problems at the Dartford Crossing, but in providing real and tangible benefits to the local area and the wider economy of the South East.

Need and benefits

8.7.7 Transport benefits include reduced journey times, additional highway capacity, improved safety, resilience and journey time reliability locally, regionally and nationally. This would help meet the demands of future traffic growth east of London.

8.7.8 Economic benefits of the Project include boosting business productivity, opening up opportunities for local economic growth and employment across the River Thames and facilitating growth exports at the region's ports.

8.7.9 The social benefits of the Project include those associated with the introduction of the Project itself, in tackling current and forecast levels of traffic congestion. This in turn would be a catalyst to improved social and economic activity within the region, brought about by the additional connectivity offered by the Lower Thames Crossing that would improve the ability for local traffic to cross the River Thames.

8.7.10 Taken together the Applicant considers these to be substantial benefits which create a clear and compelling need for the Project which is in the public interest.

National Policy Accordance

8.7.11 The review of planning policy within this Statement has demonstrated the Project's compliance with the following National Policy Statements; namely NPSNN, NPS EN-1, NPS EN-4 and NPS EN-5 and, in so far as they may be relevant to the consideration of this DCO Application, the 2021 and 2023 draft revisions to NPS EN-1, NPS EN-4 and NPS EN-5 and the final versions of these NPSs published in November 2023. The Project complies with the Government's strategic vision for the development of the national road network, wider policies for economic performance, safety, technology, sustainable transport and accessibility.

8.7.12 The Project also broadly aligns with other relevant national planning and transport policies, along with the development plans of the 'host' local authorities demonstrating accordance with paragraph 5.173 of the NPSNN. Relevant legal obligations, as set out in the NPSNN, including those under the Habitats Regulations (paragraph 4.23) and Water Framework Directive (paragraph 5.225) are also complied with.

8.7.13 Where potential is shown for the Project to result in adverse impacts, compliance with the policy provisions of the NPSs has still been demonstrated,

as demonstrated in detail in Chapter 6 of this Planning Statement and summarised below.

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Landscape and visual

8.7.14 Paragraph 5.150 of the NPSNN advises that '*great weight'* should be given to conserving landscape and scenic beauty in nationally designated areas. Paragraph 5.152 of the NPSNN establishes a strong presumption against new road building (among other things) in AONBs unless there are compelling reasons and any benefits outweigh the costs very significantly.

Kent Downs AONB

8.7.15 Chapter 6 and Appendix F to this Planning Statement explain how the Applicant has afforded great weight to the impacts on the AONB. They also demonstrate the compelling reasons that exist to justify these impacts and establish that the Project benefits very significantly outweigh the disbenefits in terms of the defined and overriding need for the Project, the absence of viable route alternatives with fewer adverse impacts within the AONB and the stated policy support for the Project as a major new road infrastructure project.

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Biodiversity

8.7.16 In relation to the loss of habitat and ancient woodland at Shorne and Ashenbank Woods SSSI, paragraphs 5.29, 5.32 and 5.35 of the NPSNN require that consent should not be granted for projects which would result in adverse effects or the loss of such designations unless the benefits clearly outweigh the impacts. It is acknowledged that the Project leads to the loss of 5.85ha of habitat from the SSSI, of which 0.95ha is designated ancient woodland, an irreplaceable habitat. Further ancient woodland is lost both north and south of the River Thames. In total, the Project would lead to the loss of 7.36ha of ancient woodland habitat. Ten veteran trees would also be lost as a result of the Project. To offset these adverse effects, ancient woodland compensatory planting is proposed to create more woodland habitat and also to link up existing areas of woodland to build resilience into the network of designated sites and habitats. In total, 80.75ha of ancient woodland compensatory planting would be created. Specific tree planting and management measures are also proposed to offset impacts to the veteran tree resource. It is considered that the national need for, and benefits of, the Project identified in Chapter 4 clearly outweigh these impacts, particularly when considered alongside the significant landscape scale compensatory habitat creation would be provided as part of the Project. The same applies to wider landscape and visual impacts (paragraphs 5.156, 5.157 and 5.158 of the NPSNN).

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8.7.17 Additionally, an increase in traffic volume during the operation of the Project would lead to the potential degradation of habitat quality within a number of designated sites and habitats, as a result of increases in nitrogen deposition on these areas. Some sites have been assessed as experiencing significant adverse effects as a result of increased nitrogen deposition, after appropriate mitigation measures have been applied. Further landscape scale compensation (described above) has been developed to account for these significant effects which would again create more high quality semi-natural habitat that would link existing retained designated sites and habitats.

Historic environment

8.7.18 In terms of impacts on designated heritage assets paragraph 5.131 of the NPSNN invites decision makers to give great weight to the asset's conservation. The more important the asset, the greater weight it should be afforded.

8.7.19 Paragraph 5.132 of the NPSNN establishes the same principle in respect of the significance of designated heritage assets. Where a development would result in substantial harm to, or total loss of, a designated heritage asset, paragraph 5.133 of the NPSNN requires that consent be refused unless it can be demonstrated that that harm or loss of significance is necessary to deliver substantial public benefits sufficient to outweigh that loss or harm unless all of four factors apply regarding reasonable and viable reuse of the asset.

8.7.20 Where harm to the significance of a designated heritage asset is less than substantial, paragraph 5.134 of the NPSNN prescribes that any harm should be weighed against the public benefits of the project.

8.7.21 Chapter 6 of this Planning Statement has identified that the Project will result in substantial harm to four designated heritage assets. However, it has also demonstrated that this harm is considered to be wholly exceptional (in terms of the Scheduled Monument) and exceptional (with regards to the three Grade II Listed Buildings). It also identifies less than substantial harm to a number of other designated heritage assets. However, this harm (substantial and less than substantial) is considered to be outweighed by the substantial public benefits of the Project summarised in Chapter 4 of this Project and presented in full in Application Document 7.1: The Need for the Project. Therefore, it is considered to be in accordance with the provisions of the NPSNN summarised above.

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Land quality

8.7.22 Paragraph 5.176 of the NPSNN invites decision makers to afford little weight to the loss of agricultural land in grades 3b, 4 and 5. By implication, therefore, some weight should be afforded to the loss of land in agricultural grades 1, 2 and 3a – the so-call 'best and most versatile agricultural land' (BAMVAL). The Project does result in the loss of some BAMVAL. However, that loss has been minimised through project design and a large proportion is a temporary loss which will be reinstated post construction of the Project. Only 1.1% of the loss is of the highest (Grade 1) quality. It is considered therefore that the loss of BAMVAL does not weigh heavily in the planning balance.

Flood risk

8.7.23 Paragraph 5.78 of the NPSNN requires that '*substantial weight should be attached to the risks of flooding and coastal erosion'*. Chapter 6 of this Planning Statement, supported by a Flood Risk Assessment (FRA) (ES Appendix 14.6, Application Document 6.3) identify that the majority of the Project lies within Flood Zone 1 (the lowest risk zone). The FRA considers all sources of flood risk associated with the Project and provides the rationale for small parts of the Project to be located in Flood Zone 3. It demonstrates how the Project complies with the requirements of the NPPF in terms of passing the 'sequential test' and the 'exception test'. The NPSNN does make provision for linear networks infrastructure to cross flood risk areas provided appropriate mitigation is

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provided to ensure that the infrastructure remains functional in the case of a flood event (paragraph 5.104). This mitigation is provided as described in section 6 of part 6 of the FRA and summarised in Chapter 6 of this Planning Statement. Accordingly, the matter of flood risk is not considered to weigh heavily in the planning balance.

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Green Belt

8.7.24 In terms of Green Belt, paragraph 5.178 of the NPSNN establishes a presumption against inappropriate development unless very special circumstances exist to justify that inappropriate development. The decision-maker is required to attach substantial weight to harm to the Green Belt in reaching a planning balance.

8.7.25 Chapter 6 and Appendix E of this Planning Statement sets out that the 'very special circumstances' are demonstrated sufficient to justify the Project, as 'inappropriate' development within the Green Belt (paragraph 5.178 of the NPSNN). This conclusion is reached based on the defined and overriding need for the Project, the lack of viable alternatives, wider policy support and its temporary or limited impacts.

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Open space and recreation

8.7.26 Paragraph 5.174 of the NPSNN advises decision makers that they should not grant consent for development on open space (including playing fields) or sports and recreational land or buildings unless the land is shown to be surplus to requirements or the benefits of the project (including need) outweigh the loss. Chapter 6 and Appendices Appendix D (Open Space) and Appendix G (Private Recreational Facilities) of this Planning Statement, identify that the Project will result in adverse impacts on a number of such facilities. However, most of these impacts are temporary and occur only on parts of sites during construction of the Project. Only one private recreational facility (see Appendix G: Private Recreational Facilities) would be lost in its entirety and that loss would be more than compensated for by way of creation of a new area of parkland on part of the site which will be an enhanced recreational space in terms of quality and quantity in a suitable location which would be better accessible to the public.

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Waste management

8.7.27 With regard to the provisions of paragraph 5.43 of the NPSNN and arrangements for waste management, although the Project would result in the exceedance of the DMRB LA 110 target of use of >1% of regional landfill capacity and so represent a significant effect (at 2.7%), if the material destined for landfill within the order limits was excluded from the assessment, this 2.7% figure would fall to 0.2% and so below the significant effect threshold. Furthermore, Project design has ensured that the generation of waste would be minimised and mitigation measures ensure that the vast majority of waste generated by the Project would be reused within the Project (ES Appendix 11.1 Excavated Materials Assessment, Application Document 6.1).

Noise and air quality

8.7.28 The temporary and localised noise, transport and air quality impacts during construction have been minimised and mitigated through Project design and secured control measures. There are no air quality effects reported for the

construction phase of the Project so the clauses of 5.12 of the NPSNN. There will be significant environmental noise effects

8.7.29 There will be some improvements and worsening of air quality as a result of the operation of the Project which have been assessed (ES Chapter 5: Air Quality, Application Document 6.1) in accordance with paragraph 5.189 of the NPSNN.

8.7.30 Along the route of the Project and in three distinct areas outside of the Project Order Limits, the noise assessment (ES Chapter 12: Noise and Vibration, Application Document 6.1) has identified that there will be significant adverse noise effects. These occur due to new road traffic noise at locations of an existing low ambient noise level. For those effects which are remote to the Project they occur as a result of a small increase in noise levels on the existing road network. The Applicant has mitigated these impacts (paragraph 5.198 of the NPSNN) as far as reasonably practicable, but in the context of Government Policy on sustainable development (5.195) these effects remain. Any residual adverse effects need to be balanced against beneficial effects in those areas which will see noise improvements from the removal of traffic from the Dartford Crossing and the other benefits the Project will deliver (see Application Document 7.1: Need for the Project).

Conclusion

8.7.31 It should be noted in respect of all of the above impacts that they arise at the end of a lengthy project design and refinement process which has been subject to considerable stakeholder engagement and public consultation. That process has sought to avoid, in the first place, adverse impacts arising as far as that is reasonable or practicable given the need to deliver a successful project which meets the scheme objectives. Where it has not been possible to avoid impacts arising, the Applicant has sought to minimise and mitigate those impacts through a range of measures either embedded into the Project design or delivered as standalone mitigation measures. Where it has not been possible to satisfactorily mitigate impacts then compensatory measures have been proposed.

8.7.32 This extensive process of avoiding, minimising, mitigating and compensating for adverse impacts through a series of Project refinements should not be lost sight of in considering the planning balance.

8.7.33 As noted above, under the provisions of section 104(3) of the Planning Act 2008, the Secretary of State must decide the Application in accordance with any relevant national policy, except where subparagraphs (4) to (8) of that section apply. This Planning Statement has demonstrated that the Project accords with the relevant national policy statements. In addition, for the purposes of section 104(7) of the Planning Act 2008, this Planning Statement has demonstrated that the benefits of the Project outweigh its adverse its impacts.

8.7.34 It light of all of the above, it is the Applicant's view that there is a clear, overriding and compelling case in the public interest for the Project. Accordingly, the policy presumption in favour of the Project and the overall planning balance lie strongly in favour of the grant of development consent.

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Glossary

Term	Abbreviation	Explanation
A122		The new A122 trunk road to be constructed as part of the Lower Thames Crossing project, including links, as defined in Part 2, Schedule 5 (Classification of Roads) in the draft DCO (Application Document 3.1)
A122 Lower Thames Crossing	**Project**	A proposed new crossing of the Thames Estuary linking the county of Kent with the county of Essex, at or east of the existing Dartford Crossing.
A122 Lower Thames Crossing/M25 junction		New junction with north-facing slip roads on the M25 between M25 junctions 29 and 30, near North Ockendon.
A13/A1089/A122 Lower Thames Crossing junction		Alteration of the existing junction between the A13 and the A1089, and construction of a new junction between the A122 Lower Thames Crossing and the A13 and A1089, comprising the following link roads: Improved A13 westbound to A122 Lower Thames Crossing southbound Improved A13 westbound to A122 Lower Thames Crossing northbound Improved A13 westbound to A1089 southbound A122 Lower Thames Crossing southbound to improved A13 eastbound and Orsett Cock roundabout A122 Lower Thames Crossing northbound to improved A13 eastbound and Orsett Cock roundabout Orsett Cock roundabout to the improved A13 westbound Improved A13 eastbound to Orsett Cock roundabout Improved A1089 northbound to A122 Lower Thames Crossing northbound Improved A1089 northbound to A122 Lower Thames Crossing southbound
A2		A major road in south-east England, connecting London with the English Channel port of Dover in Kent.
Application Document		In the context of the Project, a document submitted to the Planning Inspectorate as part of the application for development consent.
Area of Outstanding Natural Beauty	**AONB**	Statutory designation intended to conserve and enhance the ecology, natural heritage and landscape value of an area of countryside.
Code of Construction Practice	**CoCP**	Contains control measures and standards to be implemented by the Project, including those to avoid or reduce environmental effects.
Department for Transport	**DfT**	The government department responsible for the English transport network and a limited number of transport matters in Scotland, Wales and Northern Ireland that have not been devolved.

Deleted: Activity on and/or offsite required to implement the Project. The construction phase is considered to commence with the first activity on site (e.g. creation of site access), and ends with demobilisation.

Term	Abbreviation	Explanation
Design Manual for Roads and Bridges	**DMRB**	A comprehensive manual containing requirements, advice and other published documents relating to works on motorway and all-purpose trunk roads for which one of the Overseeing Organisations (National Highways, Transport Scotland, the Welsh Government or the Department for Regional Development (Northern Ireland)) is highway authority. For the A122 Lower Thames Crossing the Overseeing Organisation is National Highways.
Development Consent Order	**DCO**	Means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects (NSIP) under the Planning Act 2008.
Development Consent Order application	**DCO application**	The Project Application Documents, collectively known as the 'DCO application'.
Environmental Statement	**ES**	A document produced to support an application for development consent that is subject to Environmental Impact Assessment (EIA), which sets out the likely impacts on the environment arising from the proposed development.
Habitats Regulations Assessment	**HRA**	A tool developed by the European Commission to help competent authorities (as defined in the Habitats Regulations) to carry out assessment to ensure that a project, plan or policy will not have an adverse effect on the integrity of any Natura 2000 or European sites (Special Areas of Conservation, Special Protection Areas and Ramsar sites), (either in isolation or in combination with other plans and projects), and to begin to identify appropriate mitigation strategies where such effects were identified.
Heavy Goods Vehicle	**HGV**	A large, heavy motor vehicle used for transporting cargo.
Highways England		Former name of National Highways.
Light Goods Vehicle	**LGV**	Vehicles meeting the Department for Transport VEH04 criteria.
Local Road Network	**LRN**	
Local Transport Plan	**LTP**	Planning document produced by a local highway authority that sets out the transport planning policy framework within its area.
M2 junction 1		The M2 will be widened from three lanes to four in both directions through M2 junction 1.
M2/A2/Lower Thames Crossing junction		New junction proposed as part of the Project to the east of Gravesend between the A2 and the new A122 Lower Thames Crossing with connections to the M2.
M25 junction 29		Improvement works to M25 junction 29 and to the M25 north of junction 29. The M25 through junction 29 will be widened from three lanes to four in both directions with hard shoulders.
National Highways	**NH**	A UK government-owned company with responsibility for managing the motorways and major roads in England. Formerly known as Highways England.

Term	Abbreviation	Explanation
National Planning Policy Framework	**NPPF**	A framework published in March 2012 by the UK's Department of Communities and Local Government, consolidating previously issued documents called Planning Policy Statements (PPS) and Planning Practice Guidance Notes (PPG) for use in England. The NPPF was updated in February 2019 and again in July 2021 by the Ministry of Housing, Communities and Local Government.
National Policy Statement	**NPS**	Set out UK government policy on different types of national infrastructure development, including energy, transport, water and waste. There are 12 NPS, providing the framework within which Examining Authorities make their recommendations to the Secretary of State.
National Policy Statement for National Networks	**NPSNN**	Sets out the need for, and Government's policies to deliver, development of Nationally Significant Infrastructure Projects (NSIPs) on the national road and rail networks in England. It provides planning guidance for promoters of NSIPs on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State.
Nationally Significant Infrastructure Project	**NSIP**	Major infrastructure developments in England and Wales, such as proposals for power plants, large renewable energy projects, new airports and airport extensions, major road projects etc that require a development consent under the Planning Act 2008.
North Portal		The North Portal (northern tunnel entrance) would be located to the west of East Tilbury. Emergency access and vehicle turn-around facilities would be provided at the tunnel portal. The tunnel portal structures would accommodate service buildings for control operations, mechanical and electrical equipment, drainage and maintenance operations.
Order Limits		The outermost extent of the Project, indicated on the Plans by a red line. This is the Limit of Land to be Acquired or Used (LLAU) by the Project. This is the area in which the DCO would apply.
Outline Traffic Management Plan for Construction	**oTMPfC**	A plan setting out the strategy and measures to be adopted with respect to highway and transportation issues for the Project. The oTMPfC supports the DCO application and would be embedded within the eventual construction contractor documentation and will form an overarching and comprehensive management procedure for the contractor to adhere to.
Planning Act 2008		The primary legislation that establishes the legal framework for applying for, examining and determining Development Consent Order applications for Nationally Significant Infrastructure Projects.
Project road		The new A122 trunk road, the improved A2 trunk road, and the improved M25 and M2 special roads, as defined in Parts 1 and 2, Schedule 5 (Classification of Roads) in the draft DCO (Application Document 3.1).
Project route		The horizontal and vertical alignment taken by the Project road.
Public Right of Way	**PRoW**	A right possessed by the public to pass along routes over land at all times. Although the land may be owned by a private individual, the public may still gain access across that land along a specific route. The mode of transport allowed differs according to the type of Public Right of Way, which can consist of footpaths, bridleways and open and restricted byways.

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Deleted: Operation

Term	Abbreviation	Explanation
Ramsar site		A wetland site designated as being of international importance according to the Ramsar Convention.
Register of Environmental Actions and Commitments	REAC	The REAC identifies the environmental commitments that would be implemented during the construction and operational phases of the Project and would form part of the Code of Construction Practice if the Development Consent Order is granted.
Secretary of State	SoS	The Secretary of State has overall responsibility for the policies of the Department for Transport.
Special Protection Area	SPA	A designation under the European Union Directive on the Conservation of Wild Birds.
South Portal		The South Portal of the Project (southern tunnel entrance) would be located to the south-east of the village of Chalk. Emergency access and vehicle turn-around facilities would be provided at the tunnel portal. The tunnel portal structures would accommodate service buildings for control operations, mechanical and electrical equipment, drainage and maintenance operations.
Strategic road network	SRN	The core road network in England managed by National Highways.
The tunnel		Proposed 4.25km (2.5 miles) road tunnel beneath the River Thames, comprising two bores, one for northbound traffic and one for southbound traffic. Cross-passages connecting each bore would be provided for emergency incident response and tunnel user evacuation. Tunnel portal structures would accommodate service buildings for control operations, mechanical and electrical equipment, drainage and maintenance operations. Emergency access and vehicle turn-around facilities would also be provided at the tunnel portals.
Utility Logistic Hub	ULH	A compound required for receiving, storing and distributing the plant and materials needed to complete specific utility works. They would include facilities such as office space, welfare, refuelling, security, vehicle and wheel-wash and parking.

Appendices

Appendix A National Policy Statement for National Networks (NPSNN) Accordance Table

See document 7.2 Planning Statement Appendix A National Policy Statement for National Networks (NPSNN) Accordance Table (Application Document 7.2).

Appendix B National Policy Statements for Energy Infrastructure Accordance Tables

See document 7.2 Planning Statement Appendix B National Policy Statements for Energy Infrastructure Accordance Tables (Application Document 7.2).

Appendix C Local Authority Policy Review

See document 7.2 Planning Statement Appendix C Local Authority Policy Review (Application Document 7.2)

Appendix D Statement Appendix D Open space

See document 7.2 Planning Statement Appendix D Open Space (Application Document 7.2)

Appendix E Green Belt

See document 7.2 Planning Statement Appendix E Green Belt (Application Document 7.2)

Appendix F Kent Downs Area of Outstanding Natural Beauty

See document 7.2 Planning Statement Appendix F Area of Outstanding Natural Beauty (Application Document 7.2

Appendix G Private Recreational Facilities

See document 7.2 Planning Statement Appendix G Appendix G Private Recreational Facilities (Application Document 7.2)

Appendix H Green Infrastructure Study

See document 7.2 Planning Statement Appendix H Appendix G Green Infrastructure Study (Application Document 7.2)

Appendix I Carbon Strategy and Policy Alignment

See document 7.2 Planning Statement Appendix I Appendix I Carbon strategy and policy alignment (Application Document 7.2)

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