Lower Thames Crossing

9.54 Comments on LIRs Appendix D – Gravesham Borough Council

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Appendix D – Gravesham Borough Council

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1 Applicant's Response to Gravesham Borough Council's Local Impact Report

Table 1.1 The Applicant's response to Gravesham Borough Council's Local Impact Report (LIR) [REP1-228]

LIR Reference	Local Impact Report Extract / Applicant's Response
Paragraph 1.16 **Page 7** **Page 2**	The Council has concerns about the project but has tried to work collaboratively with the applicant. As the Examining Authority has heard at the first issue specific hearings, the applicant is willing to meet but its focus is justifying its approach and explaining why our concerns are unfounded and that we should just trust that they are correct, rather than discussing 'Plan B' options or trying to come to a resolution.
Applicant's Response	The Applicant believes that the approach they have taken is appropriate, robust and proportionate. A significant amount of engagement and consultation has been undertaken pre- and post-application, which has resulted in a number of changes and proposed changes to the Project. The key components of the Applicant's mitigation strategy, including the Register of Environmental Actions and Commitments (REAC), which forms Chapter 7 of Environmental Statement (ES) Appendix 2.2: Code of Construction Practice, First Iteration of Environmental Management Plan (CoCP) [**REP1-157**], and the Design Principles [**APP-516**], have been developed through stakeholder feedback. The Project's Control Documents (a representation of which can be found in Plate 1.2 of the CoCP) set out a detailed approach to implementation, governance and monitoring, within which the local authorities are key players.
Paragraph 1.17 **Page 7**	If National Highways are so confident that they are right in the assumptions in their technical work, the Council fundamentally does not understand why they will not put mechanisms in place for options if those assumptions are wrong. Those options will only come into play if the situation on the ground is not as modelled. Many of the Council's asks are related to this and are modelled on components from other NSIP projects as explained in our s106 asks.
Applicant's Response	The Applicant disagrees with this characterisation by Gravesham Borough Council. The Applicant's draft Development Consent Order (DCO) [**REP1-042**] and Control Plans offer flexibility to amend proposed mitigation, based on formal consultation and review of actual on-the-ground monitoring – for example, those related to the Landscape and Ecology Management Plan (LEMP), Environmental Masterplan and Traffic Management Plans (during construction). These plans are examples of long-term monitoring and management commitments developed by the Applicant. The Wider Network Impacts Management and Monitoring Plan (WNIMMP) [**APP-545**] is fundamentally a reactive management strategy enabling local highway authorities to gather evidence and seek interventions through pre-existing channels. Where monitoring is not included, it is because, based on the requirements of Design Manual for Roads and Bridges (DMRB)/Environmental Impact Assessment (EIA) guidance and application of relevant methodologies, modelling and thresholds (and the clear terms of the National Policy Statement for National Networks (NPSNN)), it is not considered to be required.

LIR Reference	Local Impact Report Extract / Applicant's Response
Paragraph 1.18 Page 8	The Council recognises that the construction phase of the LTC scheme will be disruptive, but that it is essential that every opportunity is taken to minimise the adverse impacts or to mitigate against them.
Applicant's Response	This comment is noted and the Application includes a number of plans and strategies securing mitigation for the adverse impacts of the Project.
Paragraph 1.19 and 1.24 Page 8	It is disappointing to report that despite the numerous consultations the picture that has emerged is of relatively few changes having been made to the project. Good examples where they have are extending the length of the Thames Tunnel and the width of the Green Bridges, and these changes are welcomed, but the overall position is that National Highways has shown insufficient interest in responding to concerns raised. It especially disappointing when the Code of Construction Practice (APP-336) sets out in paragraph 1.4.10 that the Project is committed to avoiding, preventing, reducing or remediating for, as far as reasonably practicable, the adverse effects of the construction and operational activities of the Project on people, businesses and the natural and historic environment. The applicant has not engaged in serious discussions about making changes to the project, hence it is necessary to suggest significant changes. Gravesham BC, Kent CC, health authorities and the emergency services are examples of agencies that will incur additional expenditure due to this project and without those demands being put, services will need to be reduced elsewhere to meet the deficit. Whilst we note their point about public money, the Council considers that National Highways is in no different position to any other developer and must address issues with its proposal in a substantive way because, otherwise, it is not adequately mitigating its impact on the Borough.
Applicant's Response	The Applicant considers that the DCO application is the product of a rigorous and lengthy review and refinement based on preliminary environmental studies, stakeholder and community feedback, and accords with the requirements of the planning system in that regard. Changes have been made to the Project during this period and these have been set out within Chapter 5 of the Planning Statement [**APP-495**], and in Project Design Report Part G: Design Evolution [**APP-514**].
Paragraph 1.20 Page 8	Despite the statement in APP-336, Highways England only appear to want to comply with all necessary statutory regulations which can have a high bar at "significant adverse", whereas the Council needs them to go beyond them to alleviate harm to local residents and businesses.
Applicant's Response	The approach to and application of mitigation is set out in Section 4.6 of ES Chapter 4: EIA Methodology [**APP-142**]. This applies mitigation in line with DMRB LA 104 (National Highways, 2020c). Appropriate mitigation and compensation is set out in each of the individual topic chapters of the ES Chapters 5 to 15 [**APP-143** to **APP-153**]. Details of control measures which have been introduced to address stakeholder feedback, which falls outside the DMRB LA 104 (National Highways, 2020c) definition, is presented in the Stakeholder Actions and Commitments Register [**REP1-176**].

LIR Reference	Local Impact Report Extract / Applicant's Response
Paragraph 1.21 Page 8	As part of this process, the Council recognise that a comprehensive mechanism is needed to allow residents and businesses meaningful engagement with Highways England and its construction partners. This needs to be instigated in advance of the commencement of construction and continue throughout the works and into the operational phase.
Applicant's Response	The Applicant agrees with this comment and has set out measures for communication and community liaison between the Applicant, Delivery Partners and all relevant stakeholders within various Control Documents, including in Chapter 5 of the ES Appendix 2.2: CoCP [**REP1-157**]; in the Framework Construction Travel Plan [**APP-546**]; and the outline Traffic Management Plan for Construction (oTMPfC) [**REP1-175**].
Paragraph 1.23 Page 8	The CoCP [**APP-336**] has altered slightly from the version shared at the Community Impacts Consultation with the addition of sentences such as "*All non-conformances will be recorded and monitored through a Contractor's action plan within an agreed risk based timescale for resolution*" to paragraph 2.7.7 which was not in the equivalent paragraph (2.6.6). However, the focus is still focused on informing rather than collaboration.
Applicant's Response	The inclusion of the process for capturing and monitoring non-conformances identified during site inspection and audits, is intended to demonstrate due process which would be included within the Contractor's Environmental Management Plan. ES Appendix 2.2: CoCP [**REP1-157**] provides the framework for controlling and enforcing any non-compliances. This is in line with National Highways and Industry best practice.
Paragraph 1.27 Page 9	The Council welcomes that National Highways' draft Section 106 Heads of Terms includes that National Highways will make available two community funds, one North and one South of the River, to provide a mechanism to address some of the residual impacts of the Project. This is something that the Council had suggested as it recognises that issues will arise that the affected communities will need to have addressed. It would not be right to suggest that any party involved in this project can identify now what those needs might be and so the fund will fill that gap.
Applicant's Response	The Applicant welcomes the comments made in the Local Impact Report by Gravesham Borough Council.
Paragraph 1.28 Page 9	The Council is disappointed that the draft Section 106 was not more comprehensive and include a range of interventions that were omitted from the material, such as the ferry, or could be triggered if certain conditions arose i.e. issues that we have be raising for some time in our response to the numerous consultations and in technical meetings and briefings. National Highways were aware of our desire for a more comprehensive section 106 package, but the agreed meetings on the secure mechanism for including such components were never arranged.
Applicant's Response	The Applicant will continue to engage on a Section 106 Agreement with Gravesham Borough Council, noting that, as submitted, the document referred to by Gravesham Bourgh Council is a Heads of Terms [**APP-505**] which states at paragraph 1.1.3 that:

LIR Reference	Local Impact Report Extract / Applicant's Response
	'*Discussions with the local authorities will continue post submission of the DCO application and an update of this document will be produced at an appropriate time and shared with the Planning Inspectorate and stakeholders*'.
Paragraph 1.29 **Page 9**	The Examining Authority asked the Council to submit its Principal Areas of Disagreement Summary Statement (AS-069) and, as a number could potentially be addressed via Section 106, the Council included the list of draft asks (AS-070). As explained in the notes at the front of the document, the Council takes a holistic view of the impacts from the scheme on its residents and businesses regardless of where responsibility for particular matters may formally sit, i.e. Kent County Council. Gravesham residents are KCC taxpayers so additional demands on services funded or provided by KCC or others will impact on GBC residents. This is why we are raising issue of school place pressures from non-home based workers' children. No additional funding means that resources will need to be taken elsewhere to the detriment of current residents.
Applicant's Response	The Applicant has considered effects on the provision of public services where appropriate within the Environmental Statement, including ES Chapter 13: Population and Human Health [**APP-151**] and where significant effects have been identified and are possible to be mitigated, appropriate mitigation has been secured. With regard to the specific example raised, relating to funding for school place pressures related to non-home-based workers' children, the Applicant considers that there is no evidence to suggest that the non-home-based workers would bring children to the area. Those that may do so would likely do so because they are moving to the area for a long contract (or permanently), and would be likely to occupy permanent accommodation that would otherwise be occupied by another family, resulting in no net additional effect to demand for places or funding. Demand for school places is influenced by a wider variety of factors including development, birth rates and Local Education Authority estates strategy.
Paragraph 1.30 **Page 9**	Simplistically the Council's asks relate to the following core concerns about the impact of the project on its residents, businesses and the environment: • The adequacy of the transport modelling for the construction and operational phases (assumptions, consideration of local road impacts etc) and all the technical studies that rely on that work about which the Council has serious concerns • Assumptions about workers, their travel and parking patterns, their accommodation needs and their service demands including demands from their families • Monitoring during construction for a range of factors is essential and the proposed monitoring regime is insufficient and focused on the contractor relationship rather than environmental and socio-economic outcomes

LIR Reference	Local Impact Report Extract / Applicant's Response
Applicant's Response	The Applicant has engaged with Gravesham Borough Council regarding transport modelling and considers that the positions of both parties are adequately set out within the Statement of Common Ground (SoCG) [**REP1-100**] items 2.1.52 to 2.1.56, and 2.1.167 (DL-1) to 2.1.169 (DL-1). The Applicant considers that assessments of the transport and socio-economic effects of construction workers have been robustly considered within a number of application documents. The Application includes commitments to monitoring and both proactive and reactive interventions in a well-governed system of regular engagement and information sharing, in order to appropriately deal with uncertainty. The monitoring approach is secured by the draft DCO [**REP1-042**] and Control Documents – a full reference list is set out in Table 14.1 of the Introduction to the Application [**APP-003**].
Paragraph 1.31 **Pages 9/10**	In summary, the Council's main asks are: • A skills and training hub in Gravesham to allow local people to take maximum advantage of construction job opportunities • Free or discounted travel for Gravesham residents over both Thames crossings • Increased environmental improvements, such as tree planting • Infrastructure to support the use of hydrogen as fuel • Improved leisure infrastructure connected to the new Cascades Leisure Centre • A proper supply of housing for LTC construction workers to avoid additional strain on the already stretched local housing market • Addressing concerns about traveller caravans on two sites which would be surrounded by construction works for five and a half years.
Applicant's Response	Delivering skills and training is the key component of the Lower Thames Crossing's Skills, Employment and Education (SEE) Strategy [**APP-505**]. The Applicant's Delivery Partners are aligned in ensuring that local people are able to take advantage of opportunities to work on the Project, and then within the wider construction industry. As part of the Employment and Skills Plans that must be produced by the Contractors, a skills gaps analysis will be undertaken to ensure that the appropriate training is offered to meet local and project needs. It is important that Contractors and their extended supply chains work with local suppliers, training providers, schools and colleges in Gravesham to support existing training provisions to ensure that initiatives are sustainable and deliver maximum impact for the local community, beyond the lifetime of the Lower Thames Crossing. The Applicant is in regular communication with representatives from Gravesham Borough Council to determine how the Programme can best support local skills initiatives and any evolving plans for a skills hub in Gravesham.

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	The Applicant's position regarding '*free or discounted travel for Gravesham residents over both Thames crossings*' is set out within the SoCG between the Applicant and Gravesham Borough Council [**REP1-100**] at item 2.1.48: '*The Applicant's position is that extending the discount received by Gravesham residents to use of the Dartford crossing would lead to additional traffic at Dartford, whereas the objective of the Project is to reduce traffic volumes on that crossing*'. The Road User Charging Statement [**APP-517**] states: '*Gravesham residents would be eligible for discounts for the use of the Lower Thames Crossing ... this aligns with the Dartford Crossing LRDS by limiting eligibility to residents of local authorities in which the tunnel portals would be situated'*. With regard to '*environmental improvements, such as tree planting*', this has been considered within a number of matters within the SoCG [**REP1-100**] under Terrestrial Biodiversity, Nitrogen Deposition and Landscape and Visual headings. With regard to '*infrastructure to support the use of hydrogen as fuel*', as part of the DCO application, the Applicant produced an innovative Carbon and Energy Management Plan [**APP-552**], which outlines a series of secured commitments, 22 in total (see Appendix E of the Plan), that put in place processes and mechanisms that would ensure the greatest likelihood of low carbon design, low carbon construction processes and low carbon material selection. The Contractors are incentivised to create a range of options to deliver low carbon solutions across the entire Project. The ground breaking mechanisms, are secured through the 22 carbon commitments presented in Table E.1 of the Carbon and Energy Management Plan [**APP-552**], and Table 15.13 of ES Chapter 15: Climate [**APP-153**], to further reduce the construction phase emissions during the procurement, detailed design and construction phases. These mechanisms would facilitate the Applicant's ambitions to deliver an industry leading carbon position, to go substantially beyond the requirements of today's policy, and would implement and promote new best practice for large-scale civil engineering projects to achieve carbon neutral construction. This represents a genuine opportunity to accelerate the UK construction industry's transition to a low-emissions future, which would also provide benefits to the local supply chain in the Lower Thames Estuary. It would not be appropriate to mandate the use of hydrogen as a fuel within the DCO as there is uncertainty on the implementation and scope for further innovation. The infrastructure needed for the construction phase has not been specified yet, as it is the task of the Contractors to prepare construction methodologies and identify and implement renewable electricity supply options and hydrogen infrastructure. An example of the Applicant's commitment to innovate and test low carbon approaches to construction includes the recent announcement of a tender issued for the purchase of significant volumes of low carbon hydrogen as a construction fuel. This is expected to kick-start the hydrogen ecosystem in the Thames Estuary giving the supply chain confidence to invest in hydrogen skills and technologies.

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	With regard to '*Improved leisure infrastructure connected to the new Cascades Leisure Centre*', this is referred to in response to paragraph 1.37 and 13.31 of Gravesham Borough Council's Local Impact Report [**REP1-228**] within this table. With regard to '*A proper supply of housing for LTC construction workers to avoid additional strain on the already stretched local housing market*', this is referred to in response to paragraphs 13.112, 13.114, 13.117, 13.123-13.131 and 13.132-13.133 of Gravesham Borough Council's Local Impact Report [**REP1-228**] within this table. With regard to '*Addressing concerns about traveller caravans on two sites which would be surrounded by construction works for five and a half years*', this is referred to in response to paragraphs 13.45-13.48 of Gravesham Borough Council's Local Impact Report [**REP1-228**] within this table.
Paragraph 1.33 Page 10	The Council contends that the LTC construction for a period of 6-8 years will create unacceptable impacts that require serious mitigation.
Applicant's Response	The Transport Assessment [**APP-529**] sets out at paragraph 8.2.1 that: '*Following the DCO Grant there would be preparatory works, referred to in the draft DCO as preliminary works taking place in 2024. The main construction period for the Lower Thames Crossing would start in early 2025, with the road being open for traffic in late 2030. These preliminary works are not considered to be significant in traffic terms and so do not form part of the assessment within this TA*'. All effects related to the construction phase have been assessed in-line with relevant legislation, policy and guidance including EIA Regulations and DMRB guidance, and all professional standards and thresholds appropriate to each individual effect and in consideration of the sensitivity of receptors in each case. The effects are set out within the Environmental Statement [**APP-138 to APP-486**] and Transport Assessment [**APP-529**]. Where significant effects are identified, these have been stated and mitigation proposed and secured appropriately by Control Documents and the draft DCO [**REP1-042**]. These provisions include the ability to review, monitor and consult on the effectiveness of any measures and change them where practicable.
Paragraph 1.34 Page 10	At the heart of these concerns, is the traffic model which underpins the highway and air quality impacts and also forms the basis of much of the various particular assessments in the Environmental Impact Assessment is considered to be fundamentally flawed. This is a common concern of a number of interested parties.
	The Applicant has engaged with Gravesham Borough Council regarding transport modelling and considers that the positions of both parties are adequately set out within the SoCG [**REP1-100**] at items 2.1.52 to 2.1.56 and 2.1.167 (DL-1) to 2.1.169 (DL-1).

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Paragraph 1.35 Page 10	It is the view of the Council that various uncertainties add very significant weight to the importance of identifying clear monitoring and mitigation strategies to be built into the proposed project but which remain absent. It is of concern that a robust monitoring and mitigation strategy for intended and non-intended impacts is not secured within the current iteration of proposed draft Development Consent Order.
Applicant's Response	There is a clear monitoring and mitigation strategy within the Applicant's proposals, which is reasonable and proportionate, informed by legislation, policy and guidelines, and secured appropriately by the draft DCO [**REP1-042**] (either directly or via Control Documents). Gravesham Borough Council has raised topic-specific concerns with the Applicant's monitoring and mitigation proposals which the Applicant has commented on throughout this table.
Paragraph 1.36 Page 10	The Council is also concerned that National Highways is disregarding issues that would be unacceptable from a private promoter and this is not acceptable. Gravesham's environment, business and residents will bear the brunt of the insufficient mitigation and compensation, and in some cases will have the added indignity of having to put up with poorer services as a result of that impact not being recognised and funded.
Applicant's Response	See Applicant Response to paragraph 1.24 of Gravesham Borough Council's Local Impact Report.
Paragraph 1.37 Page 10	Through CPO, the project removes a pitch and putt course at the rear of the Cascades Leisure Centre, which is owned by Gravesham Borough Council and provided as an important local asset, and the Southern Valley Golf Course (18 hole pay and play). That latter has now closed as a direct result of uncertainties due to the proposed scheme, but although private provided for public use. Discussion is ongoing on the pitch and putt but there is no replacement for the Golf course or another active outdoor recreation facility. Chalk Park, and other mitigation/compensation areas, extend the open space offer but in an area that is already well provided for.
Applicant's Response	The Applicant has reached a voluntary agreement with the private owners of Southern Valley Golf Club (SVGC), which reflected a form of development value in line with the owners of SVGC ambitions. Planning Statement Appendix G: Private Recreational Facilities [**APP-502**] provides an assessment of the loss of SVGC against the National Policy Statements. This concludes that the proposals, which include mitigation in the form of enhanced local recreational infrastructure including Chalk Park, are compliant with policy. The Applicant has included an area of what was SVGC as replacement land for the existing pitch and putt course or for recreation, and will continue to engage with Gravesham Borough Council and the operator of the Par 3, 9 hole golf facility regarding their aspirations for the facility. The Applicant notes that the existing Par 3, 9 hole golf facility is currently closed and overgrown and did not re-open following COVID-19 restrictions. The Applicant considers that despite the provision of a range of recreational facilities currently in and around the vicinity of Thong Lane and Gravesend East, there remains an identifiable gap in provision of natural/semi-natural green space

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	within walking distance of residents of Gravesend East (covering the urban area including Valley Drive/Riverside Park), which has been highlighted within the Council's Open Space Assessment (2016).
Paragraph 1.65 to 1.66 and 1.68 Page 17	As set out in the emerging Local Plan, the Lower Thames Crossing has had a direct impact upon the spatial choices available to accommodate future growth. A strategic option for accommodating growth to the east of Gravesend, has had to be discounted from the emerging Local Plan due to the proposed location of the project and its development boundary. As the proposals for Lower Thames Crossing have been under discussion for a considerable period of time, the potential east of Gravesend sites have never been comprehensibly analysed in Green Belt or any other terms. It should also be noted that no development (allocations or planning permissions) in Gravesham are dependent on the Lower Thames Crossing being built and rather, has highlighted above, the project limits development options within the Borough rather than enabling growth. The emerging Local Plan is at a stage where only limited, if any, weight can be placed on the published documents. As such, potential development sites that have been consulted upon under section 18, including those currently within the Green Belt, but these have no status and there is no certainty that they will be allocated in the emerging Local Plan in whole, in part or at all.
Applicant's Response	This matter has been considered within the SoCG [**REP1-100**] at item 2.1.162 (DL-1) which states: '*One of the Scheme Objectives for the A122 Lower Thames Crossing (the Project), developed by National Highways and endorsed by the Department of Transport, is to "support sustainable local development and regional economic growth in the medium to long term". The Need for the Project* [**APP-494**] *(Chapter 5) demonstrates how this objective would be met by the Project.* *The effects from the adopted and emerging development plans for Gravesham Borough Council in combination with the Project have been included in the inter-project effects assessment presented in Environmental Statement Chapter 16 Cumulative Effects Assessment* [**APP-154**] *and Environmental Statement Appendix 16.2 Short List of Developments* [**APP-484**]*. This confirms that the residual cumulative effects during construction range from neutral to slight adverse, and the residual cumulative effects during operation range from neutral to slight beneficial.* *The Environmental Statement (ES) Chapter 13 Population and Human Health* [**APP-151**] *provides an assessment of the Project on residential development land (sites or proposals identified in national or local plans, policies or strategies for development or land subject to planning permission). Table 13.9 in 6.1 Environmental Statement (ES) Chapter 13 Population and Human Health* [**APP-151**] *identifies residential development land south of the River Thames. No significant effects have been identified on residential development land in Gravesham during the construction phase of the Project.*

LIR Reference	Local Impact Report Extract / Applicant's Response
	The Planning Statement - Appendix C - Local Authority Policy Review [**APP-498**] *provides an assessment of the Project against adopted and emerging Local Plan policies, including allocations. Table 13.9 in Environmental Statement (ES) Chapter 13 Population and Human Health* [**APP-151**] *confirms that residential development land south of the River Thames has been assessed.* *It is confirmed that there is no physical overlap between the Project Order Limits and Gravesham Borough Council's draft allocations in the Gravesham Local Plan regulation 18 Stage 2 Consultation: Part 1 Local Plan core strategy partial review and site allocations October 2020, except in the case of Cascades Leisure Centre (reference GBS-R), which the Council have recently (03/03/2023) granted permission (ref: 20221293) for the demolition and redevelopment of the site to provide a new leisure centre. Any prospect of housing development on this site is, therefore, considered limited.* *Paragraph 5.173 of the National Policy Statement for National Networks (2014) states that the closer the development plan document is to being adopted, the greater the weight which can be attached to the impact of the proposal on the plan.* *Paragraph 48 of the National Planning Policy Framework (NPPF) (2019) states that the weight to be given to policies in emerging plans is dependent upon the stage of preparation of the emerging plan; the more advanced its preparation, the greater the weight that may be given. Gravesham's emerging Local Plan is at such an early stage in its preparation (Regulation 18) it can be afforded little, if any, weight in the decision-making process*.'
Paragraph 1.67 **Page 17**	The Borough Council's ability to progress with the emerging Local Plan, has been further frustrated by National Highways seeking transport work on the impact of future growth on the A2, both with and without Lower Thames Crossing. The model to be used, KCC's Kent Transportation model, was made available later than expected and needed to be populated with additional survey data. This work is currently underway and will consider the impacts of development options on the local and strategic highway networks with, and without, Lower Thames Crossing. It should be noted that the results of this work are not currently available to feed into this document.
Applicant's Response	The Applicant has provided a cordon model from the LTAM to Gravesham Borough Council, and in the past Gravesham have used this for their Local Plan work. The Applicant is not responsible for the timescales for the delivery of the Kent Transport Model (KTM) and the modelling of Gravesham's Local Plan with that model.
Paragraph 2.30 to 2.31 **Page 27**	The Borough Councils response to the Minor Refinements Consultation is set out in Appendix 2. The most basic point is that there are significant differences in approach and timescales inherent in this proposal, for which as yet the application documents do not provide any evidence. The Council's response sets out the Council's understanding of the situation. Chapter 2 needs revising to cover the possibility of a single boring machine and the DCO should be amended to prevent various possible options, like spoil disposal though the southern portal in Kent, from occurring. Chapter 11 will also need to be revised, as currently there is no material being moved North of the River to South of the River.

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	However, with the proposal for just 1TBM, material would be removed from the Southern Portal and taken through the first bored tunnel, to the North portal and the ES needs to fully reflect this. Any such change should pose no issues for the applicant of the basis of the assertions that have been made. The issue, at the moment, is the lack of evidence to support the assertions made, including how that will affect the nature and timing of activities at the South Portal i.e. Plate 2.13 above would have to revised and impacts of those understood.
Applicant's Response	The Applicant will produce an Addendum to the Environmental Statement that will address Gravesham Borough Council's concerns set out above. This will be submitted to the examination at Examination Deadline 2. As referenced in Gravesham Borough Council's response to the Project's Minor Refinement Consultation [**REP1-229**] in May-June 2023, a meeting was held between the Applicant and Gravesham Borough Council on 01 June 2023 (during the consultation period) to answer any queries that the Council may have had on the matter.
Paragraph 3.1 **Page 30**	The traffic impacts are a major concern for local residents and businesses, and their perceptions are based on the day to day experiences they have. A key point is that congestion, particularly on the A2 in the morning peak, is a regular occurrence, and this so are the consequences.
Applicant's Response	The Applicant recognises that traffic impacts are a major concern for local residents and businesses. A full assessment of potential effects related to construction and operational changes in traffic have been undertaken as set out within the Transport Assessment [**APP-529**]. The Project would result in lower traffic flows and less congestion on the A2 west of its junction with the Project. A number of Control Documents and monitoring proposals have been included within the application in order to identify and respond to effects as they arise – as have the mechanisms to communicate effects and their management to the public in order to reduce the potential for negative or unfounded perceptions.
Paragraph 3.4 **Page 30**	There is a specific Local Plan interest in how the project accommodates or hinders development in the Borough and wider across North Kent. If development cannot be accommodated in Gravesham for highway (or other) reasons, it then becomes a duty to co-operate issue with other Planning Authorities. They, if faced with the same issues, may ask questions in reverse. Development elsewhere, or lack of highway improvements, may constrain development in Gravesham by soaking up capacity that would otherwise be available for local development.
Applicant's Response	See comments above referring to Paragraph 1.65 to 1.66 and 1.68 (Page 17) of Gravesham Borough Council's Local Impact Report. The Applicant recognises that, as a result of the Lower Thames Crossing opening, people will choose to make different journeys. In many places on the network, and within Gravesham, this would lead to beneficial impacts on the network,

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	and in some cases would lead to adverse impacts. Overall, there would be more beneficial impacts within Gravesham than adverse impacts.
Paragraph 3.5 Page 30	During the construction period the effects are very much on local residents confronted with construction traffic and the disruption that will inevitably come from the construction process, especially along the A2. These will come from both actual impacts and also perceived impacts by those seeking to travel through the area or to specific locations within it.
Applicant's Response	The Applicant has sought to avoid or reduce construction impacts on the highway network where feasible. The oTMPfC [**REP1-175**] sets out measures to minimise disruption to users of the public highway network. Where construction activities for the Project are likely to proceed at the same time as the construction of other projects in proximity to it, Contractors will manage this in a coordinated way, maximising opportunities to reduce the overall impact on communities and the environment. A National Highways Traffic Manager would be appointed for the entire Project network (i.e. logistic routes and routes requiring temporary traffic management). Their role would include oversight of and coordination with third-party Project construction activities to minimise the impacts on the public and stakeholders. Further measures relating to construction traffic management are set out in ES Appendix 2.2: CoCP [**REP1-157**]. With regard to perceived effects, the Applicant aims to reduce the risk of this by adopting measures for communication and community liaison between the Applicant, Contractors and all relevant stakeholders, including local communities within various Control Documents, most notably in Chapter 5 of ES Appendix 2.2: CoCP [**REP1-157**], in the Framework Construction Travel Plan [**APP-546**], and the oTMPfC [**REP1-175**].
Paragraph 3.7 Pages 30/31	The macro planning question is whether the Lower Thames Crossing actual acts to restrict development across North Kent as well as what the direct impacts might be on local traffic movement. At a level of local roads is congestion significantly worse as a result of the project. National Highways is in no different position than any developer in this regard, something the current draft NPSNN acknowledges, in needing to deal with the impacts of its scheme.
Applicant's Response	See comments above referring to Paragraph 1.65 to 1.66 and 1.68 (Page 17) of Gravesham Borough Council's Local Impact Report.
Paragraph 3.10 Pages 31/32	An obvious feature of the A2 is the number of junctions along it in relatively close proximity to one another. In the just over 15km between M25 J2 and M2 J1 there are six other junctions. This is related to the way it has evolved from a country lane rather than having been designed from scratch. The last rebuild removed some of the local access points that still existed in the mid 2000's. Given the density of development in both Dartford and Gravesend with the A226 being the riverside route of very variable quality, the A2 is an essential part of the local road network. Removal of Marling Cross junction (never suggested but an obvious way of simplifying the A122 junction) would simply not be acceptable in traffic terms within Gravesend and would overload the Tollgate junction.

LIR Reference	Local Impact Report Extract / Applicant's Response
Applicant's Response	As noted by Gravesham Borough Council, the Applicant has no proposals to remove the Marling Cross junction.
Paragraph 3.14 **Page 33**	The Lower Thames Crossing project seeks to introduce a major new road link (A122) between the M2 and M25 but does not of itself alter anything else. Although mostly three lanes, the section southbound between M25 and A13 is only two lanes. Crossing the Thames it is providing 3 additional lanes in each direction, making a total of 7 lanes including the Dartford Crossing. The modelling assumes an hourly capacity of 16,000 at Dartford (7,500 northbound due to the tunnels, 8,500 southbound) and 13,980 at A122.
Applicant's Response	The Applicant does not recognise the figures quoted and suggests reference to the Table 8.11 of the ComMA Appendix C: Transport Forecasting Package [**APP-522**].
Paragraph 3.17 **Pages 33/34**	As set out in the Gravesham (RR-0368) Relevant Representation the route selection process was as a result of work undertaken in a series of reports by consultants for Department of Transport dating back to 2009. The 2017 route selection process was based on an outline design consulted upon in 2016 that assumed a simple junction on the A2 and did not include rebuilding the A2 through the Kent Downs AoNB to the M2. There was confusion in relation to the approach adopted to possible improvements at the Dartford Crossing. Circumstances have materially changed since then, especially in relation to matters like the carbon budget, climate change and the outworking of vehicle electrification on air quality (which is a major issue in Dartford).
Applicant's Response	The Applicant's consideration of whether circumstances relating to the route selection process have materially changed has been set out in response to Gravesham Borough Council's concerns within the SoCG [**REP1-100**] at items 2.1.6 and 2.1.7 – setting out that: • The Applicant does not agree that the route selection is inappropriate and considers that the selection process and consideration of alternatives has been robust, with regard to the points raised by Gravesham Borough Council. This is set out in ES Chapter 3: Assessment of Reasonable Alternatives [**APP-141**]. • The Planning Statement [**APP-495**] (Section 5) and Need for the Project [**APP-494**] set out evidence to address the alternatives considered and demonstrate the accordance of the consideration of alternatives with the relevant National Policy Statement. Carbon was assessed for road user emissions at the route selection stage, and did not vary significantly between the various options. Local design changes since then, such as the A2 junction, will not have altered the emissions significantly enough to have altered the final route selection.
Paragraph 3.18 **Page 34**	The Council would contend that the route selection process did not consider the full environmental implications of the route, even in outline form appropriate at that stage. Given the changes that have occurred since on a whole range of matters it would be appropriate to fully reconsider the scheme.

LIR Reference	Local Impact Report Extract / Applicant's Response
Applicant's Response	It is not agreed that the route selection process did not consider the environmental implications of the route. The Applicant notes that Chapter 5 of the Planning Statement [**APP-495**] includes a section on Project evolution that sets out the chronology of the options, alternatives and how the pre-application process has influenced the DCO application and Project design. Additionally, the ES Chapter 3: Assessment of Reasonable Alternatives [**APP-141**] provides detailed information regarding the environmental assessment and selection of the proposed route, reporting on the alternatives and options considered.
Paragraph 3.19 **Page 34**	The modelling takes due account of public transport but does not address what might be done at a larger scale to change matters. This comes at two levels. The local public transport options, that may relieve the crossing(s) of some of the local trips on the highway network and at the more strategic level what might be done about freight using the Channel Tunnels or the ferries from Dover.
Applicant's Response	The Project would create opportunities for public transport operators to develop new local and regional bus services, by providing new connectivity between Kent, Thurrock and Essex. Identification and development of these routes is the responsibility of the relevant operators. Local buses will not have to pay the user charge for the Lower Thames Crossing, reducing operating costs for operators as is set out in Section 2.2 of the Road User Charging Statement [**APP-517**]. The Applicant notes that at paragraph 8.43 of Kent County Council's Local Impact Report [**REP1-241**], Kent County Council states: '*KCC acknowledges that both positive and neutral traffic impacts of the LTC tend to occur in areas where the effects of the crossing are diminished, or where traffic is dispersed by the presence of two Thames crossings. This tends to have a positive or neutral impact on public transport in the vicinity of the LTC once it is in operation. In particular, KCC believes the LTC will have a positive impact on Fastrack A and the Dartford bus network*'. As set out in Section 5.3 of the Planning Statement [**APP-495**], the role that other transport modes, including rail, might play in addressing congestion at the Dartford Crossing has been considered from the outset. Further information is set out in Annex B.2 of the Annexes to Post-event submissions, including written submission of oral comments, for ISH1 [**REP1- 183**].
Paragraph 3.20 **Page 34**	The Tilbury Ferry, from Gravesend to Tilbury, is a local facility that is well used, but has restricted hours (05:40 from Gravesend to 19:10 from Tilbury) and does not run on Sunday's. Financially it depend on subsidy from Kent and Thurrock Councils. The application mentions it as a link at the construction stage but makes no proposals to improve it. The possibility of extending the Fastrack network to Thurrock has been discussed but would depend on it have some form of priority on whatever crossing it used. The A122 (without a junction at Tilbury connected to the local network)

LIR Reference	Local Impact Report Extract / Applicant's Response
	does not provide good connectivity into Thurrock due to the A13 junction design. On the Kent side it would be necessary to use the A2 to access destinations. The service and emergency access link to the A226 is not appropriate for regular bus use.
Applicant's Response	As set out within the SoCG [**REP1-100**] at item 2.1.111, the Applicant recognises the opportunity to, and importance of, improving sustainable transport provision across and along the river, but as complementary measures to the Project which provides the infrastructure improvements that may facilitate measures. By providing the north-south connection and junction improvements, this means that the whole of the Project route will be accessible to local and longer distance public transport routes, if operators choose to make use of it, including operators supporting, for example, cross-river Walking, Cycling and Horse-riding (WCH) transit (by bus). The Applicant considers that local authorities are best placed to lead on the development and appraisal of future public transport projects, including ferry and bus services across the river. The Applicant has set up a Sustainable Transport Working Group involving local authority stakeholders to investigate sustainable travel and cross river connectivity enhancements that could be delivered in the future to complement the Project. The Sustainable Transport Working Group has proposed several local priorities and opportunities for feasibility studies for future funding applications for Designated Funds. Designated Funds are very much considered the appropriate mechanism for providing these measures, which fall outside of the remit of the DCO, but may be facilitated by it to lead to improvements in sustainable modes and forms of transport across the river. A number of constraints prevent segregated public transport access to the crossing, notably using the emergency accesses. The emergency access roads/merges/diverges have been specifically designed to optimise emergency service accessibility and response times. However, the emergency access roads and Lower Thames Crossing merges/diverges have not been designed to a DMRB standard for public use. The operation of the emergency access (as designed) is to be supported by the Regional Operations Centre and appropriate interventions. This introduces incompatibility between emergency service operation and bus operations. The principles apply to the access points at the North and South Portals. As such, while it is agreed that public transport use can help to reduce congestion and air quality effects, and unlock economic growth, the Applicant considers that it has assessed options for inclusion within the Project appropriately and concluded that this will not be appropriate. The Applicant has provided alternative means that facilitate and support public transport schemes outside of the DCO application (via the Sustainable Transport Working Group).
Paragraph 3.21 Page 34	The more strategic issue, given the focus on HGV traffic, is the lack of a strategy from the Department for Transport for rail freight or port traffic. Greater use of the railways to move freight and diverting HGV's bound for the Midlands or further north to east coast ports would not solve all issues but could reduce traffic pressures considerably.

LIR Reference	Local Impact Report Extract / Applicant's Response
Applicant's Response	The Applicant notes that, as set out in Section 5.3 of the Planning Statement [**APP-495**], the role that other transport modes, including rail, might play in addressing congestion at the Dartford Crossing has been considered from the outset has provided. Following ISH1, the Applicant has provided more information on this matter as part of Annex B to the Applicant's post-event submissions, including written submission of oral comments, for ISH1 [**REP1-183**]. The Applicant notes that 7% of the HGVs using Dartford Crossing are vehicles going to/from the Eurotunnel or the Port of Dover, and 17% of the HGVs that use Dover/Eurotunnel use the Dartford Crossing. It is already possible for freight traffic from Eurotunnel to use the HS1 rail line, and so traffic that would wish to use rail rather than road already has this opportunity. At Dover there is not a connection to the rail network nor the available land to provide one. It does not appear that there is a credible option to achieve a sufficient modal shift of freight from road to rail, so as to meet the Scheme Objectives and remove the need to provide additional highway capacity across the River Thames east of Dartford.
Paragraph 3.24 **Page 35**	The Council would contend that the complexity of the *(A2/A122)* junction layout raises a number of concerns over legibility to users, and therefore ease of use and the risk of accidents. The Council has not carried out any sort of safety audit but has considered the design from the drivers point of view. A consistent theme of our response to consultations has been requests to understand how this junction is laid out physically, but that translates through into ease of use.
Applicant's Response	The design evolution of the M2/A2/A122 Lower Thames Crossing junction is set out in Project Design Report Part G: Design Evolution [**APP-514**]. The full junction design can been seen in Junction Layout Plans [**PDB-003**]. Safety has been a prime consideration throughout the evolution of the Project design, underpinned by the Applicant's compliance with the requirements of the Design Manual for Roads and Bridges, which includes the requirement to undertake an independent Road Safety Audit of the scheme.
Paragraph 3.27 **Page 35**	The logical high level consequences of this design for Kent, and therefore propositions to be tested, are: • Relief for the Dartford Crossing in that north to south traffic can use A122 if it originates or has a destination further east in Kent or Essex • For most traffic going 'round' London on the M25 a diversion via the A122 does not provide an alternative route as it is double the length • As a side effect relief to the A2 west of the A122 due to the flows that have been diverted • Increased traffic on M2 J1-J3 • Increased traffic on M2/A2 to Dover for traffic bound for Eastern docks • Increased traffic on A229 to reach the M2 (J3) from M20(J6) to/from Channel tunnel and east Kent

LIR Reference	Local Impact Report Extract / Applicant's Response
	• Relief to the M20 J6 – J1 and M25 3 – J1a from traffic seeking to reach Dartford Crossing • Re-orientation of trips from Gravesend/Northfleet area to reach Thurrock and beyond depending on the precise start and end points and therefore potential implications on the local road network
Applicant's Response	The Applicant's Transport Assessment [**APP-529**] includes reference to all of the roads and junctions identified by Gravesham Borough Council above and presents the forecast changes in traffic as a result of the Project.
Paragraph 3.28 Page 35	It may be noted that now from the M20 J6 the A229/M2/A2/A282 route is shorter than M20/M25/A282 by just over 5km. J3 at Swanley is free flow for this movement as is J2 for A2 onto the M25 (technically A282 at the crossing), and the gradient up Wrotham Hill (M20) is easier that up Blue Bell Hill (A229). Given this the HGV's in particular generally remain on the M20. The M2/A2 route involves turning off at M20 J6 to go up Blue Bell Hill and then dealing with the twin roundabouts at M2 J2, which is more complicated.
Applicant's Response	This comment is noted.
Paragraph 3.29 Page 36	Medway Council has already highlighted to the Examination (EV-030 ISH1 transcript 22 June and in its Relevant Representation (RR-0682) the issues that exist at M2 J1 (Three Crutches) now, as a result of existing planning permissions, especially for employment use that are not included in APP-523 7.7 Combined Modelling and Appraisal Report Appendix C the Annex A Uncertainty log. The National Highways comments to Medway Council on planning applications noted concerns about both congestion and safety at M2 junction 1, specifically the northbound off-slip and the southbound on-slip links to the A2. They consider that the junction has limited spare capacity. The limit is 60 extra movements during either the morning or evening peak travel periods has been imposed.
Applicant's Response	The Applicant has provided comments on this matter at paragraphs A.4.4 to A.4.7 in the Annexes to Post-event submissions, including written submission of oral comments, for ISH1 [**REP1-183**].
Paragraph 3.30 Page 36	The capacity of the M2 between J1-J3, the operational capability of J3 and J6 M20 are obvious matters of concern, because they pose potential constraints on the project. Queuing is to be found in the AM peak on the A229 connection to the M2, A229 connection to the M20 and the M2 coastbound offslip. In the evening the latter is an issue and the A229 connection to M2 queues back onto the A229. The junction, with its traffic signal control, has limited capacity between stop lines, so easily blocks up.
Applicant's Response	The Applicant has supported Kent County Council with its submissions to DfT, with regard to its proposed A229 Bluebell Hill improvement scheme.
Paragraph 3.31 Page 36	It is noted that APP-525 7.7 Combined Modelling and Appraisal Report – Appendix D – Economic Appraisal Package – Distributional Impact Appraisal Report at paragraph 7.9.6 says that five links are forecast to experience a change of

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	over 50 casualties over a five-year period and a greater than 5% change in the number of accidents compared to that forecast in the Without Project scenario in the 2030 opening year. Three of these are reductions on the M20, the increases however are (the use of south and northbound is very confusing as the M2 overall runs east – west): a. M2 between junction 2 and junction 3 (southbound) which is forecast to have an increase in casualties of 17% b. M2 between junction 3 and junction 2 (northbound) which is forecast to have an increase in casualties of 25%.
Applicant's Response	This comment is noted. The Applicant would also note that the section of the ComMA Appendix D: Economic Appraisal Package – Distributional Impact Appraisal Report [**APP-525**] referred to by Gravesham Borough Council, also states the following decreases in casualties: '*c. M20 between junction 2 and junction 1 (northbound) which is forecast to have a decrease in casualties of 22%* *d. M20 between junction 1 and junction 2 (southbound) which is forecast to have a decrease in casualties of 10%* *e. M25 between junction 28 and junction 27 (northbound) which is forecast to have an increase in casualties of 10%*'. And summarises that: '*The percentage of casualties for all motorway links forecast to experience a change in over 50 casualties is within 12% of that for motorways for both the regional study area and Great Britain for all vulnerable groups. All links are therefore assessed as a medium impact with no distributional impact for vulnerable user groups, using the criteria set out in TAG guidance (30% lower to 30% higher for the class of road)*'.
Paragraph 3.32 **Page 36**	Kent CC acknowledges these issues and has as a result submitted a Large Local Major Strategic Outline Business Case to the Department for Transport for a proposed scheme to address these issues. At the time of writing they had not received a response to this case, so this project falls to be considered without it. Gravesham Council's view has been that such a scheme should be Associated Development since it is crucial to projects operation. As an already failing junction (and the limitations at M20 J6) it is not in a position to take significant additional traffic, with the logical consequence of diverting flows onto A228 or A227 as drivers seek alternative routes.
Applicant's Response	The Applicant notes – as set out within the SoCG between the Applicant and Gravesham Borough Council [**REP1-100**] at item 2.1.154 (DL-1), that once the Lower Thames Crossing opens for traffic, there will be changes in how traffic flows across the region. These changes are set out in Chapter 7 of Transport Assessment [**APP-529**]. In many places on the network, and notably at the Dartford Crossing, this would lead to significant beneficial impacts on both journey times and journey reliability. In some locations this change in road user decisions could lead to adverse changes. This includes the A229 where major adverse impacts are predicted, as set out in Chapter 7 of Transport Assessment [**APP-529**]. However, the Applicant is aware that Kent County Council is currently developing a Strategic Outline

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	Business Case seeking DfT funding for improvements to the A229 Bluebell Hill M2 and M20 junctions, due to existing traffic flows in this location. Overall, the benefits on the road network would outweigh the adverse impacts, and this is reflected in the positive economic benefit of the Project as a whole, and within each affected local authority area. The Project is proposing to monitor the impacts of the Project on the local and strategic road networks. If the monitoring identifies opportunities to further optimise the road network as a result of traffic growth or new third-party developments, then local authorities would be able to use this as evidence to support scheme development and case making through existing funding mechanisms and processes. This process is set out in the WNIMMP [**APP-545**], which provides information about the proposed traffic monitoring, which includes the A229 junctions with both the M2 and the M20. The Applicant and Kent County Council have been working together to finalise Stage 1 of a WNI study – a KCC owned study funded by the Applicant – to investigate impacts on the wider network in Kent. The Applicant does not consider that the proposed interventions are required to make the Lower Thames Crossing acceptable, and that they should be developed in line with Government policy and funding mechanisms outside of the Lower Thames Crossing. The Applicant has said that it will cooperate with KCC in this matter. Further to this, the Applicant remains of the view as set out within the draft SoCG between the Applicant and Kent County Council [**REP1-103**] at items 2.1.25 and 2.1.26 that: '*The Applicant recognises that as a result of the Lower Thames Crossing opening, people will choose to make different journeys. In many places on the network, and within Kent, this will lead to beneficial transport impacts on the network, and in some cases will lead to adverse impacts. Overall, the benefits on the road network outweigh the adverse transport impacts, and this is reflected in the positive economic benefit of the Project within Kent.* *The Applicant has identified the adverse impacts on traffic flows across the local road network, and this assessment has been set out in the Transport Assessment.* *The Applicant has assessed the wider network impacts of the Project and has considered these against the requirements set out in the National Policy Statement for National Networks (DfT, 2014), and based on this does not agree that the adverse impacts are unacceptable under this policy.* *The Applicant is obligated to work with local highway authorities and others to align national and local plans and investments, balance national and local needs and support better end to end journeys for road users (The Applicant Licence from DfT para 5.1.9) and will continue to deliver against this obligation in its collaborative work with local authorities.* *The Applicant has produced a Wider Network Impacts Management and Monitoring Plan (WNIMMP) [**APP-545**], which has been updated to take on board comments received to date. If the monitoring outputs from the monitoring plan*

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	identify issues/opportunities related to the road network as a result of traffic growth or new third party developments, local authorities will be able to use this as evidence within their intervention case making. *The WNIMMP provides clarity on the proposition, including the expectations on funding streams*'. (item 2.1.25) '*The Applicant agrees that there are some likely increases in traffic across the network, which will in part be caused by the Project, but not wholly, and this is set out within the Transport Assessment and traffic modelling data issued to Kent County Council.* *While The Applicant does not consider that there any transport impacts requiring mitigation by the Project, nor any subsequent intervention options needed, it notes that:* • *The Applicant is considering the need for enhancements along the A2/M2 corridor which are within the RIS3 pipeline.* • *The Applicant is continuing to progress the M2 junction 5 project separately to the Lower Thames Crossing.* • *The Applicant maintains a route strategy for the M25 south of the proposed connection with the Lower Thames Crossing, the M20, A2 west of the junction with the Lower Thames Crossing, and to the M2 east of junction 1.* *In addition, The Applicant has agreed a scope of work and funded this through a Planning Performance Agreement for Kent County Council to undertake a Strategic Outline Business Case (SOBC) study to identify the impacts of the Project on the Kent road network and to assess the business case of potential interventions to optimise the network.* *The outputs of this study will allow Kent County Council to make informed representations during the DCO examination and will enable Kent County Council to develop more advanced business cases over the course of the next 10 years through existing processes*'. (item 2.1.26)
Paragraph 3.33 to 3.34 Pages 36/37	As has already been highlighted significant parts of the strategic and local networks are already running at or near capacity. The day to day impact of this is 'rat running' whereby when an incident of some sort occurs resulting to additional congestion those in the 'know' divert off the mains roads and seek alternative routes, generally involving small local roads in the rural or urban areas. Some examples, derived from local knowledge: • Congestion on A2 at Cobham causes a diversion onto A289 and then A226 through Higham and finding a way through urban Gravesend • Congestion at M2 J1 if on the A289 southbound causes a diversion through Higham and as above • Congestion on M2 causes leaving it at J2 A228 and use a route via Cuxton and Cobham, or coming off at the Cobham junction and going via Cobham, Sole Street, Meopham and Longfield to avoid the A2 as far as possible.

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	• From M20 east of J6 alternative options to Blue Bell Hill include use Peter's Bridge to A228, A228 from J4 or A227 from J2a (M26) • Congestion on A2 past Gravesend causes use of either a southern route via Cobham, Sole Street, Meopham, Longfield or seeking a way through the Gravesend/Northfleet urban area
Applicant's Response	National Highways will work with the Emergency Services and local authorities to ensure the timely resolution of any incident on the network and will seek to manage traffic through diversion routes on the strategic road network (SRN) where possible. Utilising Variable Messaging Signage across the network, National Highways will seek to provide the travelling public with sufficient information to guide route selection, wherever possible in advance of reaching an incident, and remain on the SRN where possible.
Paragraph 3.35 Page 37	As Cobham Parish Council will testify something happens with great regularity and explains some of the differences between the flows in Lower Thames Area Model and those observed from local monitoring. The modelling assumes an average situation with everything working, which is frequently not the case in practice.
Applicant's Response	The LTAM is a Steady State Assignment model. A key assumption in such models is that all drivers have perfect knowledge of the time and cost of alternative routes and that they decide which route they will take before they start their journey, based on the journey times and distances of alternative routes given the routes being taken by other traffic on the network. Once a driver has decided on a route, they do not deviate from this; even if the journey time along a link on their route varies once they have started their journey, from the journey time in average conditions upon which choice of route was based. In reality, in the event of a short-term incident some traffic would remain on the main carriageway, while some other drivers may attempt to leave at the next junction. In-car GPS devices may advise drivers as to the best course of action. The proportion of drivers taking either action is not known, nor can such behavioural responses be coded into the LTAM, or any similar model developed in line with TAG. For longer term incidents (such as to cause an impact on travel times that lasts for a period of several hours or longer), the variety of behavioural responses is greater and in order to model the impact of longer term incidents, it is necessary to have data on the likely behavioural response of drivers. For those drivers who have pre-warning of the incident and check travel conditions before they start their journey, some will decide not to make the trip at all, others will decide to travel at another time, others may still make a trip but go to another destination, and yet others may re-route. These choices, if known, would then be reflected in the travel matrices which are the input to the LTAM that describe the number of trips going from each origin to destination zone by journey purpose and vehicle type. Responses such as these are not included in transport models because sufficiently detailed data on people's behavioural responses to a road closure does not currently exist.

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Paragraph 3.36 Page 37	One of the claims made is that the A122 will produce greater resilience across the strategic network. APP-518 7.7 Combined Modelling and Appraisal Report at plates 3.19 & 3.20 contains information on congestion in Dartford and Thurrock as a result of one event at the Dartford Crossing. In one sense this is self-evident that two crossings must be better than one. However the applicant has provided no hard evidence that this is the case, in a similar form to that mentioned above. If 4 lanes are lost at Dartford, for example the QE2 bridge is closed for high winds, 7 lanes of traffic (at peak) will not fit into 3 lanes on the A122. If northbound traffic on A282 blocks back to J2 access to the A2 coastbound can become blocked, and therefore the A122 would be inaccessible other than by using smaller roads. This applies equally to a blockage in the new tunnel.
Applicant's Response	The Project's design reduces the risk of incidents occurring. The Dartford Crossing has restrictions on vehicle dimensions in the northbound tunnels and on vehicles carrying hazardous loads. Normal traffic is held approximately every 15 minutes as hazardous load vehicles are escorted through the northbound tunnels, causing traffic to build up on the approach to the northbound crossings. In contrast: 1) the tunnel for the Project has been designed as a Category A tunnel, which can be used by vehicles carrying hazardous loads; 2) the tunnel would have dual three-lanes which would enable it to accommodate higher and wider vehicles; and 3) the Project has been designed as a free flow addition to the road network and does not have closely spaced junctions. Traffic flows are forecast to reduce at the Dartford crossing by an average of 19% in the peak hours as a result of the Project (as set out in Traffic Forecasts Non-Technical Summary [**APP-528**]), which would reduce the likelihood of incidents at Dartford and make the crossing more resilient. It is therefore anticipated to be rare that either crossing will fully closed for incident purposes, and that all traffic would need to be diverted to/from the Project. Should one of the crossings close, having an alternative provides more resilience than not having one. Both crossings would be managed in accordance with standard National Highways Incident Management Processes (DMRB GM703) to provide a co-ordinated response to incidents at either crossing, including: management through the Regional Operations Centre; Traffic Officer resources; national management escalation structure for dealing with the response to different levels of incident; and communications resources for advanced warnings (message signs, social media, press, radio, etc.). The operational plan for the Dartford Crossing would remain unchanged (i.e. if the bridge were to close in the event of an emergency, the east tunnel would be used for southbound traffic, therefore maintaining 2 lanes in each direction at Dartford). The Applicant notes that the bridge has been closed due to high winds on only six occasions since 2019.
Paragraph 3.37 Page 37	The business case for the lower Thames Crossing produces a headline BCR of 1.22 which is very low for a project of this scale. Numerous factors go into this calculation, so the interaction between them is very complex. The Council has already highlighted at Issue Specific Hearing 1 day 2 EV-025 that chapter 11 of APP-526 sets out the sensitivity tests that have been conducted, and essentially by varying some of the input factors, including the levels of traffic growth. Thus there is a high growth and a low growth traffic assumptions, and also varying some of the cost factors.

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Applicant's Response	There is a positive case for the Project as set out in the Need for the Project [**APP-494**]. The impacts of the project and the benefits delivered are weighed in the planning balance as reported in Section 8.7 of the Planning Statement [**APP-495**], which concludes that there is '*a clear, overriding and compelling case in the public interest for the project*'. The economic appraisal is set out within Combined Modelling and Appraisal Report (ComMA) [**APP-518**], and in more detail within ComMA Appendix D: Economic Appraisal Package – Economic Appraisal Report [**APP-526**], and ComMA Appendix D: Economic Appraisal Package – Level 3 Wider Economic Impacts Report [**APP-527**]. The Applicant notes that the BCR of 1.22 is indicative of Low Value for Money (based on DfT criteria). It is often the case that larger schemes have lower BCRs than smaller projects because of the much higher costs. Furthermore, larger schemes provide the strategic infrastructure which enable other projects and benefits to be realised.
Paragraph 3.38 **Page 37**	Interested parties have voiced a number of concerns over the business case appraisal, including: • The business case is not up to date • Use of NTEM 7.2 whereas NTEM 8.0 came into operation in December 2022 • The shift from an initial BCR of 0.48 to 1.22 (table 7.17 of APP-518) depends on critical assumptions which may be invalidated by changing circumstances and nebulous 'agglomeration benefits'.
Applicant's Response	The Applicant considers that the Project does provide value for money. Appendix D of the Combined Modelling and Appraisal (ComMA) Report [**APP-526**] is an Economic Appraisal Report, which details the latest scheme cost estimates, calculated benefits and Project BCR. The BCR of the Project has been updated at each stage of the assessment. Whilst it is acknowledged that the BCR has changed over time, the BCRs from each stage cannot be compared on a like-by-like basis as the changes have reflected updates to government guidance. The economic appraisal of the Project has been produced following the guidance at the time the valuation was made. For the DCO application, this is as is set out in the ComMA Report [**APP-518**]. The initial BCR of 0.48 is based on Level 1 benefits alone. The adjusted BCR of 1.22 is based on Level 1 and Level 2 benefits. The benefits have been calculated following DfT's Transport Appraisal Guidance (TAG) and using the DfT's TUBA and WITA software. The Applicant does not agree that agglomeration benefits are nebulous. The Applicant notes that NTEM 7.2 was used for the assessment for the DCO application which was submitted in October 2022. The revised DfT traffic growth forecasts, known as NTEM 8.0, were not definitely released until November 2022, which was after the submission of the DCO application.
Paragraph 3.39 **Pages 37/38**	The business case makes it clear that Gravesham residents are major beneficiaries of from the project, principally due to the access to jobs and other facilities that the crossing will allow in Thurrock. Currently Gravesham has low levels of

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	unemployment, a relatively cheap housing market for its distance from London and has good links to London (including HS1 is 24 minutes) with its multiple job opportunities and higher wages. A larger range of job opportunities may indeed become available, but how far these will be taken up is not as simple function of accessibility. These 'benefits' of course have to be set against the negative implications is other subject areas. The Council is not convinced that these claimed benefits are substantive.
Applicant Response's	The recognition of the benefits of the Project is welcome. The Applicant's position is that there is a clear, positive case for the Project as set out in the Need for the Project [**APP-494**]. The impacts of the project and the benefits delivered are weighed in the planning balance as reported in Section 8.7 of the Planning Statement [**APP-495**], which concludes that there is '*a clear, overriding and compelling case in the public interest for the project*'. The economic appraisal is set out within Combined Modelling and Appraisal Report (ComMA) [**APP-518**], and in more detail within ComMA Appendix D: Economic Appraisal Package – Economic Appraisal Report [**APP-526**], and ComMA Appendix D: Economic Appraisal Package – Level 3 Wider Economic Impacts Report [**APP-527**]. The Environmental Statement assesses the impact of the Project on a variety of environmental topics, including heritage, ecology, landscape and population and human health. The ES Non-Technical Summary (NTS) [**APP-486**] provides an overview of the work undertaken and signposts to the detailed assessments. The detailed assessments include details of how the Applicant is proposing to mitigate the forecast environmental effects of the Project. The reported impacts and mitigation are included in the economic appraisal detailed above. The ComMA Appendix D: Economic Appraisal Package – Economic Appraisal Report [**APP-526**] identifies at Table A.34 that Gravesham will receive net positive transport economic efficiency benefits, and ranks as the second highest recipient of these benefits among all Local Authorities. Transport economic efficiency benefits are made up in large part by vehicle journey time savings
Paragraph 3.40 **Page 38**	What cannot be seen is any sensitivity testing carried out of the value of time input away from the central case assumption, and WebTAG unit 1.3, which is on user and provider impacts, recommends sensitivity testing on the value of time, at paragraphs 4.2.19, 4.2.20, 4.3.6, and 4.3.7, and the sensitivities that it recommends are for work time. A sensitivity of plus or minus 25% to the value that you've chosen to use, and for non-work time, depending on whether it's a commuting journey or a non-commuting journey, the range it recommends is either plus or minus 25% or plus or minus 60%. Those are obviously fairly large, sensitivities, if they were to be included.
Applicant's Response	The Applicant has responded to Gravesham Borough Council on this matter within Annex H.2 of the Annexes to Post-event submissions, including written submission of oral comments, for ISH1 [**REP1-183**].

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Paragraph 3.41 Page 38	What WebTAG also advises is that that sensitivity testing should be carried out and should be reported on separately from the main assessment. At the moment the Council can't see where that sensitivity testing on value of time has been carried out or reported. Much of the benefit-to-cost ratio (BCR) is informed by the time savings, so the value of time input will be an important component I that calculation. Given that the adjusted BCR gives a value for money ratio which is categorised as 'low' in the hierarchy the Council would expect do see sensitivity testing plus or minus those kind of magnitudes of that particular input. It is of course only one input to a whole process, but it could have a marked a marked effect on the overall result. Business travel has logically reduced post COVID as many meetings are now conducted online.
Applicant's Response	The Applicant has responded to Gravesham Borough Council on this matter within Annex H.2 of the Annexes to Post-event submissions, including written submission of oral comments, for ISH1 [**REP1-183**].
Paragraph 3.42 Page 38	Throughout the consultation process and in our Relevant Representation (RR-0368) we have raised issues concerning the assumptions used in the modelling process. We accept that LTAM is what it is, a high level model of the strategic network with all the constraints and benefits that go with that. The obvious limitations from the local perspective are that the model: • does not include the full local road network • is not validated fully on the local road network • Is focussed on the links between nodes rather than the operation of those nodes (which micro simulation models would address) • Is 2016 based which whilst reasonable initially is now significantly out of date, both through the passage of time and the impact of changing working patterns post COVID • The analysis years with the two year delay are now incorrect
Applicant's Response	The LTAM has been developed in line with the DfT's Transport Analysis Guidance (TAG), which advises on best practice in transport models that provide evidence for use in the appraisal of transport schemes and policies. The development of the LTAM forecasts is detailed fully in the Combined Modelling and Appraisal Report [**APP-518**]. The Applicant has engaged with Gravesham Borough Council to understand their concerns regarding the Project's transport model, and has shared detailed outputs to aid their understanding of the forecast impacts of the Project on the road network. The Applicant notes that the LTAM is a strategic transport model and covers a vast area, and has been calibrated and validated in line with DMRB guidance. Details of this are contained within the ComMA Appendix B: Transport Model Package [**APP-520**]. In the Applicant's view, given the scale and detail of the model, it is not possible to achieve

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	validation on every road, although care has been taken in the areas close to where the Project would interface with the existing road network. The Applicant does not agree that the age of the baseline data would reduce the reliability of the model. The Applicant notes that the last "pre-COVID" year is 2019, which is only three years after the LTAM base year. Traffic levels have returned after COVID and the pattern of travel on the highway network in the area remains similar to that observed in 2016. Microsimulation modelling has been carried out on the Marling Cross junction of the A2 and the A122 junction with the A2, as detailed within Localised Traffic Modelling Appendix H: Traffic Operational Appraisal - VISSIM Forecasting Report [**REP1-194**], submitted at Deadline 1. The DCO application has been developed in line with standard practice. The draft DCO [**REP1-042**] sets a time limit on the start of works (Requirement 2) as follows: '*The authorised development must begin no later than the expiration of 5 years beginning with the date that this Order comes into force*'. A two year rephasing sits within this five year time limit. That five year period is heavily precedented in DCOs across all sectors, and is intended to accommodate circumstances such as this type of delay. DCO applications typically do not provide any sensitivity assessments associated with that five year period of commencement flexibility, but instead reflect a reasonable worst-case scenario to provide adequate information for the Examining Authority and Secretary of State to reach conclusions on likely significant effects. Consequently, the DCO, if granted as drafted, would allow for this two-year rephase without any need for change in the Application documents, including the submitted assessments and the proposed powers sought within the draft DCO.
Paragraph 3.43 **Pages 38/39**	The Council is currently spending a significant sum of money, over £200k on traffic modelling exercise in relation to the Local Plan using the Kent Area Model at the behest of National Highways, due to their concerns regarding the functioning of the Strategic Road Network and A2 junctions within Gravesham. At National Highway's request work this has included additional expenditure on data collection to populate that model, including data for the functioning of the Tollgate junction, which could now of be used to improve the accuracy of LTAM. Whilst the results of this work are not yet agreed and public, the Council's desire is for the outputs to inform our input to the Examination when they are. However, from the outset of any modelling undertaken to support the emerging Local Plan, National Highway has to date insisted that the modelling is only utilised to support the emerging Local Plan and not used to undermine LTAM. This is despite asking for the modelling to be done, with and without Lower Thames Crossing. This would appear to be a poor use of public funds, if National Highways have confidence in their own modelling which should demonstrate impacts of future growth within Gravesham and beyond on the SRN. Alternatively, if National Highways are of the view that such work is needed to correlate to their own outputs, then any deviations between the modelling need to be considered and addressed accordingly.

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Applicant's Response	The Applicant has full confidence in the LTAM and that it is the appropriate transport model to use to assess the impacts of the Lower Thames Crossing. As the local highway authority, Kent County Council, have developed a strategic transport model that would be the most appropriate tool to use to assess the impacts of Gravesham's Local Plan on the road network. The National Highways South-East Spatial Planning Team (SESPT) have liaised with the Council (late 2022 to summer 2023) to agree the modelling needed to support the emerging Gravesham Local Plan. In common with other local authorities in Kent, the Council are using the KCC county model. This involves taking the base model (previously agreed by National Highways) and then applying Local Plan-related and other assumptions to it, to create an up-to-date new base case/reference model to be used for forecasting. Not untypically, the assumptions require some new survey-based evidence to input into the model. During this period, the Council and SESPT have liaised to agree assumptions/surveys, etc. The Council's Local Plan needs its own modelling to support it. The modelling prepared to support the Lower Thames Crossing is for an entirely different purpose and hence would not be suitable to base the GBC Local Plan upon.
Paragraph 3.44 **Page 39**	In terms of the inputs the Council is concerned that the development inputs to the model: • Do not include sufficient quantities of development through the reliance on adopted as opposed to emerging Local Plans plus planning permissions back in September 2021 • Are constrained by NTEM which does not reflect the requirements of housing development currently required by the standard methodology introduced by 2018 NPPF (and by extension the jobs needed to support that population)
Applicant's Response	The Applicant has followed DfT Transport Appraisal Guidance (TAG) when developing the future year levels of traffic demand in the area. TAG obliges the control of traffic growth in an area to the projections set out in the DfT's national Trip End Model (NTEM), as set out in Section 6.3 of the Combined Modelling and Appraisal Report [**APP-518**]
Paragraph 3.45 **Page 39**	For the assessment of impact it is necessary to take account of the level of change between the do nothing and do something options, that is changes brought about by the project. Some junctions or lengths of road may already be experiencing significant congestion, and future growth already in the system may make this worse. An increase on traffic on a main road may not be that significant (though it is usually the junctions that are the pinch points), but through the village (e.g. Thong or Cobham) may be. There are also the implications for bus journey times and the safety of cyclists and pedestrians (for the latter especially where there are no footways).
Applicant's Response	This comment is noted – Section 7.11 of the Transport Assessment [**APP-529**] has assessed the implications of the Project on public transport journey times. ES Chapter 13: Population and Health [**APP-151**] and the Health and Equalities Impact Assessment (HEqIA) [**APP-539**], use information from the Transport Assessment and assess the

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	accessibility impacts in relation to changes to both car and public transport users, as well road safety impacts on affected communities/sensitive populations.
Paragraph 3.47 Page 40	These numbers act as an overall control on the model results, with the new and project development proving the spatial distribution and therefore loading on specific parts of the network. For the six districts listed the difference between the Standard Method total figures increment between 2021 and 2039 for NTEM 7.2 and 8 is 58% and 40% respectively. The total households from the 2021 census for the above districts is 372,700 to put a scale on the change compared with the base.
Applicant's Response	The level of traffic growth is lower in NTEM 8.0 than in NTEM 7.2. However, a reduction in traffic flows results in some traffic that would previously not have been able to travel to their preferred location or at their preferred time of day, now being able to travel. As a result of the variable demand modelling, the forecast traffic flows would be much closer than the simple comparison of the total number of trip ends in NTEM 7.2 and NTEM 8.0 would suggest.
Paragraph 3.48 Page 40	This introduces a constraint which fundamentally distorts into the model which means whilst there is a discussion to be had about what might actually happen in terms of actual building (and jobs growth also needs to be considered) the levels of development being asked for by Government are significantly higher than the NTEM suggests.
Applicant's Response	The Applicant is obliged to follow DfT TAG and a discussion of what might happen in terms of future housebuilding and jobs growth is not relevant as part of the DCO application. The Applicant has provided an assessment within the Transport Assessment [**APP-529**] of the impact of the Project on the road network, if the level of traffic growth is lower or higher than the central NTEM 7.2 scenario.
Paragraph 3.49 Page Page 40	In this regard a key point is that one of the main functions of the traffic forecasts is to feed into the Environmental Assessment which requires consideration of a reasonable worst case. This is a different test from the requirements of WebTAG, Green Book etc. which seek to provide comparative basis for assessing schemes and their business cases. In this regard we are talking about an 'and' not an 'or', that is a sensitivity test to see how robust the projections might be and what issues may arise is a reasonable worst case. This feeds directly though into traffic air quality and noise assessments but is also of relevance for biodiversity. The problem is that despite being asked the applicant has not provided this information to allow a robust assessment to be made. Any analysis of LTAM results therefore treats them as a minimum.
Applicant's Response	**Air Quality** The operational phase air quality assessment presented in ES Chapter 5: Air Quality [**APP-143**] has been carried out in accordance with the guidance detailed in National Highways DMRB LA105. Paragraph 2.2 of this states that which

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	states that '*The air quality assessment shall be based on the most likely forecast traffic flows. NOTE: there is no requirement to model other traffic growth sensitivity scenarios for example high and low growth traffic scenarios*'. Additionally, it is considered that the predictions of NO_2 presented in ES Chapter 5: Air Quality [**APP-143**] in the opening year are likely to be conservative. This is because the modelled roadside NO_2 concentrations have been uplifted following the application of a gap analysis (using National Highways' LTTE6 tool), which takes into consideration the assumed (and historically optimistic) roadside rates of reduction in NOx and NO2 by Defra's modelling tools compared to the observed monitoring trend. **Noise** Similarly with noise, the operational phase noise assessment is presented in ES Chapter 12: Noise and Vibration [**APP-150**] and has been carried out in accordance with the guidance detailed in National Highways DMRB LA111. The noise assessment is based on the same traffic forecast in order to present the *likely* significant effects, and also to maintain the integrity of the data that forms a basis for the assessment.
Paragraph 3.51 to 3.52 Pages 40/41	It is fully appreciated that the applicant has done analysis in accordance with WebTAG and DMRB. Those processes contain all sort of the assumptions to be chosen from as well as approached to ensure comparability across project. the reasons for doing such analysis are fully understood. However the key issue before the Examination is not what the impacts are in some artificial world – but what are they in terms of the environmental impact on the ground. That has to be based on a view of the real world. The PINS s.51 advice note from 18 March 2021 says, "DMRB guidance does not constitute policy or law. Developers/ applicants should be able to answer questions about the particular anticipated effects of the Proposed Development, and the methodologies of assessment undertaken in the ES – and not solely rely on referring back to DMRB guidance". It goes on to say, "the assessment should with professional judgement fit the Proposed Development – the relevant EIA Regulations are what should be applied to the content of an ES". This is a point the Borough Council has consistently made in the past and needs to be reflected in the application material.
Applicant's Response	This matter has been raised through the SoCG between the Applicant and Gravesham Borough Council [**REP1-100**] at item 2.1.63 which states that: '*The Applicant agrees that the EIA regulations represent the law which has been followed in the development of the ES.* *The Applicant has adopted the DMRB as a standard for assessments to ensure transparency and consistency.* *The ES takes account of other relevant professional guidance to inform its thresholds and interpretation of likely significant effects and does not solely rely on DMRB.*

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	This matter remains under discussion subject to Gravesham Borough Council's review of the application documents and actions agreed following post-submission engagement on the matter (including the provision to The Applicant of a topic-by-topic reference of where concerns are related to the use of DMRB guidance and EIA Regulations).'
Paragraph 3.53 Page 41	The scheme makes passive provision for an additional junction at the northern portal (Tilbury Access Road for port development), supported by Thurrock Council and Port of Tilbury. Thurrock Council have also suggested a new junction at South Ockendon to support new development). These, and their associated developments, also have implications for the traffic flows on the LTC road and start changing its character from a strategic road link to a more local road. They have not been modelled so it is not possible to say from the current material what the implications from these proposals might be.
Applicant's Response	The Tilbury Link Road (TLR) has been identified in the RIS2 as part of the RIS3 pipeline of projects. During the review of the Project undertaken when the Thames Freeport was designated, the Applicant sought direction and received instruction from Department for Transport (DfT) and Department for Levelling up, Housing and Communities (DLUHC) that the TLR should be progressed through a separate consenting process to the Project. The revised design at Tilbury Fields provides an operational access, with no access for public traffic on or off the Project at this location. This operations and emergency access has not been designed specifically for any particular future connection into the local road network, but that future opportunity is not prejudiced. If the local authority or a third-party stakeholder is considering any future development, they would need to liaise with National Highways' Spatial Planning team to develop their proposals. Any new road connecting to the Project at this point would have to follow the relevant planning process at the appropriate time. Similarly, should a third party come forward with a proposal for a junction at South Ockendon, this will need to be discussed with the National Highways Spatial Planning team.
Paragraph 3.54 Page 41	It is also essential that there is a proper monitoring of the performance of the highway network (strategic and local) when the scheme is complete to see what actual issues arise, and have a set of possible interventions. In an area like this it will be a complex position because of the interactions between existing issues, the results of new development, other changes to the highway network and the project.
Applicant's Response	The Applicant is proposing to monitor the impacts of the Project on traffic on the local and strategic road networks. If the monitoring identifies opportunities to further optimise the road network as a result of traffic growth or new third-party developments, then local authorities would be able to use this as evidence to support scheme development and case making through existing funding mechanisms and processes. This process is set out in the WNIMMP [**APP-545**], which provides information about the approach to traffic monitoring and monitoring locations. An updated WNIMMP is included in the application, and the Applicant has also provided a briefing on the changes made to the WNIMMP since a draft version was shared in the July 2021 Community Impacts Consultation. The traffic impact monitoring scheme referenced in the WNIMMP is secured by Schedule 2 of the draft DCO [**REP1-042**], and would require approval by the

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	Secretary of State after consultation with relevant local highway authorities, which would begin one year before the tunnel area opens.
Paragraph 3.55 Page 41	Equally from the ExA point of view it has to be place in a wider picture to assess whether, in layman's language, the gain justifies the pain. It is important to note that there will be gains locally.
Applicant Response's	The Applicant welcomes the comments made in the Local Impact Report from Gravesham Borough Council that there would be gains locally.
Paragraph 3.57 Page 41	Monitoring approach of seeing whether projections are met and if not, what is the toolkit from which measures could be drawn. There are a number of A2 junctions where the impacts may require action. This will arise from a combination of LTC impacts, natural traffic growth and development proposals. In an induvial case there is going to be a need to sort out who is responsible for what – not an easy task. If a developer is expected to pay the fact that they happen to be called National Highways does not release them from their obligations to deal with impact.
Applicant's Response	The Applicant is proposing to monitor the impacts of the Project on traffic on the local and strategic road networks, as set out in the WNIMMP [**APP-545**]. If the monitoring identifies issues or opportunities related to the road network as a result of traffic growth or new third-party developments, this can be used as evidence to support scheme development and case making through existing funding mechanisms and processes. A number of junctions along the A2 are listed as monitoring locations in the WNIMMP. Data collected at these locations as part of the traffic monitoring scheme can be used by the Applicant to inform investment decisions on the SRN. Over time, it will be very difficult to demonstrate that traffic flow changes on the road network were solely as result of the Project and not other factors, such as wider demand for travel, nearby new development, or changes in the way the road network was managed. As such, the Applicant considers it appropriate that the existing framework for managing the road network, as set out in Transport Assessment Appendix F: Wider Network Impacts Management and Monitoring Policy Compliance [**APP-535**], remains the appropriate way to make decisions about future investment priorities. The traffic impact monitoring scheme will be secured in Schedule 2 of the draft DCO [**REP1-042**], would require approval by the Secretary of State, after consultation with relevant local highway authorities, and would begin one year before the tunnel area opens.
Paragraph 3.59 Page 42	Previous work commissioned by KCC on a previous version of LTAM has identified a series of local junctions that may need improvement, on which KCC is doing additional technical work to establish precisely what works should be done. It is important to emphasise that this is about the impact of the LTC on the local roads – not about issues that already exist on the network. Subject to the results of this work, it is the view of the Borough Council that National Highways should be making provision for funding any works that are required because of this projects impact.

LIR Reference	Local Impact Report Extract / Applicant's Response
Applicant's Response	The Applicant's position on this matter has been set out within the SoCG between the Applicant and Kent County Council [**REP1-100**] at items 2.1.25 and 2.1.26: '*The Applicant recognises that as a result of the Lower Thames Crossing opening, people will choose to make different journeys. In many places on the network, and within Kent, this will lead to beneficial transport impacts on the network, and in some cases will lead to adverse impacts. Overall, the benefits on the road network outweigh the adverse transport impacts, and this is reflected in the positive economic benefit of the Project within Kent.* *The Applicant has identified the adverse impacts on traffic flows across the local road network, and this assessment has been set out in the Transport Assessment.* *The Applicant has assessed the wider network impacts of the Project and has considered these against the requirements set out in the National Policy Statement for National Networks (DfT, 2014), and based on this does not agree that the adverse impacts are unacceptable under this policy.* *The Applicant is obligated to work with local highway authorities and others to align national and local plans and investments, balance national and local needs and support better end to end journeys for road users (The Applicant Licence from DfT para 5.1.9) and will continue to deliver against this obligation in its collaborative work with local authorities.* *The Applicant has produced a Wider Network Impacts Management and Monitoring Plan (WNIMMP) [**APP-545**], which has been updated to take on board comments received to date. If the monitoring outputs from the monitoring plan identify issues/opportunities related to the road network as a result of traffic growth or new third party developments, local authorities will be able to use this as evidence within their intervention case making.* *The WNIMMP provides clarity on the proposition, including the expectations on funding streams*'. (item 2.1.25) '*The Applicant agrees that there are some likely increases in traffic across the network, which will in part be caused by the Project, but not wholly, and this is set out within the Transport Assessment and traffic modelling data issued to Kent County Council.* *While The Applicant does not consider that there any transport impacts requiring mitigation by the Project, nor any subsequent intervention options needed, it notes that:* • *The Applicant is considering the need for enhancements along the A2/M2 corridor which are within the RIS3 pipeline.* • *The Applicant is continuing to progress the M2 junction 5 project separately to the Lower Thames Crossing.* • *The Applicant maintains a route strategy for the M25 south of the proposed connection with the Lower Thames Crossing, the M20, A2 west of the junction with the Lower Thames Crossing, and to the M2 east of junction 1*.

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	In addition, The Applicant has agreed a scope of work and funded this through a Planning Performance Agreement for Kent County Council to undertake a Strategic Outline Business Case (SOBC) study to identify the impacts of the Project on the Kent road network and to assess the business case of potential interventions to optimise the network. *The outputs of this study will allow Kent County Council to make informed representations during the DCO examination and will enable Kent County Council to develop more advanced business cases over the course of the next 10 years through existing processes*'. (item 2.1.26) The Applicant and Kent County Council have been working together to finalise Stage 1 of the WNI study referred to by Kent County Council, and are now working on the scope for remaining stages to complete the study. A first draft of that report was shared with the Applicant in February, and following discussions, a final draft has been received on 17 July 2023. The Applicant can confirm that the conclusions and recommendations of the Stage 1 report has been agreed for the purposes of Stage 2 (tasks 2-8): the options appraisal stage. The Applicant would add that the WNI study is a KCC-owned study, funded by the Applicant, to investigate impacts on the wider network in Kent. The Applicant does not consider that the proposed interventions are required to make the Lower Thames Crossing acceptable, and that they should be developed in line with Government policy and funding mechanisms outside of the Lower Thames Crossing. The Applicant has said, pursuant to its licence, that it will cooperate with KCC in this matter.
Paragraph 3.60 **Page 41**	This essentially is about the local road element of the junction not the mainline flow. Those of concern are the main junctions feeding the urban area at Pepper Hill, Tollgate and Marling Cross. Congestion at these locations then reacts back on the rest of the local network, as well as possibly raising safety issues on the strategic if slip road are blocking back onto the main carriageway.
Applicant's Response	The Applicant is proposing to monitor the impacts of the Project on traffic on the local and strategic road networks as set out in the WNIMMP [**APP-545**]. If the monitoring identifies issues or opportunities related to the road network as a result of traffic growth or new third-party developments, this can be used as evidence to support scheme development and case making through existing funding mechanisms and processes for both the local and strategic road networks. A mechanism allowing for review of the proposed monitoring locations is provided through Requirement 14 in Schedule 2 of the draft DCO [**REP1-042**], which requires the preparation of an operational traffic impact monitoring scheme, which must be approved by the Secretary of State following consultation with the relevant highways authorities (including Gravesham Borough Council). Relevant highways authorities will be able to propose locations for inclusion, which will be considered by the Applicant during the development of the operational traffic impact monitoring scheme. The final decision on inclusion will be made by the Secretary of State through the approval process, as set out in Part 2 of Schedule 2 of the draft DCO [**REP1-042**].

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Paragraph 3.61 Page 41	The consultation material includes various tables and diagrams on traffic flow with and without the project. The baseline is an already highly congested highway network. Reference has been made to the benefits of LTC for the Dartford Crossing. Figure 3.5, however shows that whilst there is a short term benefit, in the longer term congestion returns to its current levels or put another way the crossing remains capacity limited. Given past experience already referred to the above it is likely to return towards the levels of congestion seen currently due to supressed demand.
Applicant's Response	Table 5.1 of the Traffic Forecasts Non-Technical Summary [**APP-528**] shows the forecast flows across both the Dartford Crossing and the Project. In the year the Project is planned to open, the LTAM predicts that traffic levels on the Dartford Crossing will fall on average by around 19%, with a 17% reduction in the AM peak and a 21% reduction in the PM peak. The traffic forecasts derived from the LTAM include growth in line with DfT traffic forecasts, and this forecast growth means that the Project would not maintain the same level of relief to the Dartford Crossing over time. However, even after the road has been open for 15 years (2045), traffic levels using the Dartford Crossing are still predicted to fall on average to fall by 14%, with a 9% reduction in the AM peak and a 17% reduction in the PM peak. In addition, journey time benefits across the Dartford Crossing remain; in 2045 journey times between M25 junction 2 (with the A2) south of the River Thames and M25 junction 31 (for Lakeside) north of the River Thames would almost halve from 14 minutes without the Project, to just over seven and a half minutes with the Project. Further journey time forecasts for 2045 are shown in Transport Assessment Appendix C: Journey Time Changes 2045 [**APP-532**].
Paragraph 3.63 Page 42	There is a gain in cross river flows as a result of the LTC since overall capacity is increased from 4 lanes in each direction to 7. Traffic increase overall is in the order of 50% by 2045 (see figure 5.2) from the 2016 base. This extra traffic has to be accommodated somehow on the existing network (the modelling makes due allowance for known improvements such as M2 J5 now under construction).
Applicant's Response	This comment is noted.
Paragraph 3.60 Page 41	The plans in APP-528 7.8 Traffic Forecasts Non Technical summary (and in much more detail in APP-529 and appendices) show increased flows • A229 Bluebell Hill and M2 J3 • M2 J3 - J1 (noting Medway Councils comment on J1 today and the conditions imposed by National Highways) • A289 • A228
Applicant's Response	This comment is noted. The Applicant remains of the view as set out within the SoCG between the Applicant and Kent County Council (KCC) [**REP1-103**] in items 2.1.25 and 2.1.26:

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	'*The Applicant recognises that as a result of the Lower Thames Crossing opening, people will choose to make different journeys. In many places on the network, and within Kent, this will lead to beneficial transport impacts on the network, and in some cases will lead to adverse impacts. Overall, the benefits on the road network outweigh the adverse transport impacts, and this is reflected in the positive economic benefit of the Project within Kent.* *The Applicant has identified the adverse impacts on traffic flows across the local road network, and this assessment has been set out in the Transport Assessment* [**APP-529**]. *The Applicant has assessed the wider network impacts of the Project and has considered these against the requirements set out in the National Policy Statement for National Networks (DfT, 2014), and based on this does not agree that the adverse impacts are unacceptable under this policy.* *The Applicant is obligated to work with local highway authorities and others to align national and local plans and investments, balance national and local needs and support better end to end journeys for road users (The Applicant Licence from DfT para 5.1.9) and will continue to deliver against this obligation in its collaborative work with local authorities.* *The Applicant has produced a Wider Network Impacts Management and Monitoring Plan (WNIMMP)* [**APP-545**]*, which has been updated to take on board comments received to date. If the monitoring outputs from the monitoring plan identify issues/opportunities related to the road network as a result of traffic growth or new third party developments, local authorities will be able to use this as evidence within their intervention case making.* *The WNIMMP provides clarity on the proposition, including the expectations on funding streams.*' (item 2.1.25) '*The Applicant agrees that there are some likely increases in traffic across the network, which will in part be caused by the Project, but not wholly, and this is set out within the Transport Assessment* [***APP-529***] *and traffic modelling data issued to Kent County Council.* *While the Applicant does not consider that there any transport impacts requiring mitigation by the Project, nor any subsequent intervention options needed, it notes that:* • *The Applicant is considering the need for enhancements along the A2/M2 corridor which are within the RIS3 pipeline.* • *The Applicant is continuing to progress the M2 junction 5 project separately to the Lower Thames Crossing.* • *The Applicant maintains a route strategy for the M25 south of the proposed connection with the Lower Thames Crossing, the M20, A2 west of the junction with the Lower Thames Crossing, and to the M2 east of junction 1.* *In addition, the Applicant has agreed a scope of work and funded this through a Planning Performance Agreement for Kent County Council to undertake a Strategic Outline Business Case (SOBC) study to identify the impacts of the Project on the Kent road network and to assess the business case of potential interventions to optimise the network.*

LIR Reference	Local Impact Report Extract / Applicant's Response
	The outputs of this study will allow Kent County Council to develop more advanced business cases over the course of the next 10 years through existing processes.' (item 2.1.26)
Paragraph 3.65 Page 41	Conversely there are reductions along the A2 west of the A122. London bound this makes sense, however coastbound, which larger drop, is not so obvious since the existing traffic logically would continue to use the A2 to reach destinations further east and would not be interested in using the A122.
Applicant's Response	This comment is noted.
Paragraph 3.66 Page 44	The pattern is clear from figure 3.8 that there is a shift in flow, as would be logically expected, from the M20 corridor to the M2 corridor, with the consequential pressure on the connecting roads and junctions. Given the limitations of the A229 there is a spreading of flow on to the A228, and potentially the A227. The A228 has some dual carriageway south of Snodland, and passive provision for dualling up to Halling. The section through Cuxton however would be challenging to widen due to the constraints of North Downs scarp face, quarrying, built development, the river and the need to ascend to M2 height. Figure 3.9 shows the position in 2045 with additional traffic growth.
Applicant's Response	This comment is noted.
Paragraph 3.67 Page 45	On more local roads the modelling suggests additional traffic on: • Henhurst Road • Thong Lane • Warren Road/Cobhambury Road • A227 / Wrotham Road
Applicant's Response	This comment is noted.
Paragraph 3.68 Page 45	Appendix 3 contains more detailed information on the local roads. It should be emphasised that this is based on LTAM data, with all the caveats that apply to that and also does not take account of the detail of how the junctions may function. If these become congested then all sorts of new 'rat runs' may open up. Further no account is taken in this of other benefits or impacts from the scheme. A227 will be subject to further analysis when there is more information on the Tollgate junction. This has been the subject of detailed discussions with National Highways in relation to the 2014 Local Plan Core Strategy and the specific planning applications.
Applicant's Response	This comment is noted.

LIR Reference	Local Impact Report Extract / Applicant's Response
Paragraph 3.69 Pages 45/46	In broad terms the major change is the loss of the Cobham/Shorne on/off slips direct to the A2. The best route to Marling Cross junction then becomes the key determinant. As a result: • A lot of links benefit compared with the non LTC world (though whether that is acceptable is another matter). • Henhurst Road shows a significant increase in traffic and, at a lesser scale dose Warren Road/Cobhambury Road. • Henhurst Road also shows an increase in HGV movements which may indicate any coming up the Wrotham Road (A227) may use this as a route to avoid Tollgate, for which it is not suitable due to width.
Applicant's Response	This comment is noted.
Paragraph 3.70 Page 46	The comparison it with the no LTC world, and the graphs in Appendix 3 show the numbers actually involved. A small change on a small number can produce a large % change, so care is needed in interpreting the results. It is also important to state that this does not been that current conditions on these sections of highway are acceptable.
Applicant's Response	This comment is noted.
Paragraph 3.71 Pages 56/57 41	The Emergency Services, in both construction and operation phases, are concerned about access both to incidents (especially the lack of a hard shoulder on the A122) and to implications to the response times across the wider highway network.
Applicant's Response	The Lower Thames Crossing is being designed to be an All Purpose Trunk Road, similar to the many miles of A-roads used by millions of motorists every year across the UK, not a motorway. It will feature Emergency Areas (on the link roads) and technology, such as stopped vehicle detection, CCTV and electronic signing and signalling. Should a vehicle need to stop before it reaches an emergency area, technology used along the route will be designed to detect the stopped vehicle, alert an operator and the over-lane signals will be changed to indicate that the affected lane is closed to traffic. Safety is a key priority for the Applicant. The new tunnel and roads will be designed and built to the highest safety standards recommended today, and the Applicant continues to adapt its design to incorporate advances in design and technology that emerge in the years ahead. In the past, the Lower Thames Crossing has been referred to as an A-road using Smart Motorway technology. This is because there are common standards for certain design such as traffic and stopped vehicle detection systems, electronic signing and signalling, and Emergency Areas. The Applicant has included these in the design of the Lower Thames Crossing as they support the project's safety objectives and make the road safer. The Project Design Report Part C: Design Rationale [**APP-508**] describes how the Project responds to the ten principles of good design. Paragraph 4.1.2 states that '*Safety is fundamental to the design of the Project route and the*

LIR Reference	Local Impact Report Extract / Applicant's Response
	road alignment, signage, barriers, structures and other highways elements have been designed to ensure the safety of users. The issue of safety becomes the overriding concern with design issues…'. The Project Design Report Part G: Design Evolution [**APP-514**] outlines key design changes as a result of consultation feedback and/or The Applicant Design Review Panel (NHDRP) over the course of Project development. Changes made at Supplementary Consultation in 2020 included: • Removal of the hard shoulder from the eastbound connector road along the A2. To mitigate this, it was replaced with a hard strip and if an incident occurs, it is proposed to control the traffic to prevent the connector road backing up into the tunnel. • A hard shoulder was retained on the Brewers Road eastbound slip to accommodate broken-down vehicles at this junction. The Project Design Report Part D: General Design South of the River [**APP-509**] describes the approach to Project design in this location. Paragraphs 4.3.1 and 4.3.2 note that the Project has been designed to commence at the existing A2, and includes the widening of the A2 between the junction with Henhurst Road and Valley Drive through to junction 1 of the M2 to generally provide four lanes each way with hard shoulders. To achieve the proposed widening of the A2, the alignment has been altered to the west of the M2 junction 1. Through the M2 junction 1 the design includes the widening of the A2 from three lanes to four, with intermittent hard shoulders along this length. Paragraph 4.3.4 notes that the Preliminary Design includes the provision of two new two-lane link roads, north and south of the A2, connecting to the existing A289 and the A2 at the eastern end. These link roads have been designed to re-provide the two connections removed from the existing arrangement. Both the eastbound and westbound connecting roads have hard strips. ES Chapter 2: Project Description [**APP-140**] defines these further as being 1m-wide hard strips on the edge of the carriageways. Elsewhere within the Project alignment (to the north of the River Thames), ES Chapter 2: Project Description [**APP-140**] states that: • In Section 7 of the Project (A13/A1089/A122 Lower Thames Crossing junction), paragraph 2.3.134 states that the Project road would be two lanes in both directions through the new junction, along which hard shoulders would be provided. • Within Section 9 of the Project (A122 Lower Thames Crossing/M25 junction), paragraphs 2.3.187 and 2.3.188 reference the approach to widening of the M25 in this location: in the southbound direction, the M25 would be widened from four lanes with a hard shoulder to five lanes with a hard shoulder, between the M25 junction 29 southbound on-slip and A122 southbound off-slip; through M25 junction 29, the existing M25 would be widened from three lanes each way with hard shoulder to four lanes each way with hard shoulder in both directions.

LIR Reference	Local Impact Report Extract / Applicant's Response
	The Consultation Report [APP-064 to APP-069] states, in response to stakeholder feedback, that the Project proposals submitted for the application for development consent have been designed in accordance with the Design Manual for Roads and Bridges (DMRB) (The Applicant, 2019) standards published in July 2019, with the designs being reviewed against all standards published since that date, up to March 2022. The detailed design for the Project would be carried out by the appointed Contractors in accordance with the DMRB standards published at the time of detailed design. The DMRB specification used for the design of the Project does not require a hard shoulder because it features advanced safety systems, including variable mandatory speed limits, red-X lane signalling to support incident management, stopped vehicle detection systems, CCTV, and emergency areas for road users to access in an emergency. Incident management plans and protocols would play a key part in minimising the impact of incidents. These systems are included in the Project's design to support its safety objectives and make the road safer for all road users. The Applicant would use the most current stopped vehicle detection systems available at the time of opening, minimising both the risk of collisions and any reductions in traffic flow associated with temporarily closed lanes. The use of such technology would mean the new road would include more safety measures than existing A roads. Furthermore, collision data shows that while hard shoulders are perceived as places of safety on a conventional motorway, there are still significant risks of being in a collision for those who stop in them. On the contrary, emergency areas are safer places for vehicles to stop, largely because they are set back further from moving traffic.
Paragraph 3.72 Page 47	The Emergency Services also have concerns over the evacuation of the drivers and passengers from the tunnels in the event of an emergency event that requires this, and how they might be safely handled. Rendez-vous (RVP) points are provided both north and south of the river for emergency use, but from the planning point of view it is not clear what these actually consist of and how they will sit in their Green Belt location. Most of the time they will not be in use but must be available at very short notice should a major incident occur.
Applicant's Response	Engagement with the Emergency Services has resulted in changes to the Project throughout the pre-application period, including identifying location and requirements for Rendezvous Point (RVP) locations and agreeing the provision of helicopter landing points during the construction and operation of the project for emergency services. The RVP would be secured with perimeter fencing and may also include lighting and a small structure, to be determined in consultation with the Emergency Services during the detailed design.
Paragraph 3.75 Page 47	Economic growth – the upside is the improvement of links across the Thames, but the downside is that effectively congestion points are created or enhanced elsewhere so it is difficult to see in reality (as opposed to an econometric analysis) what the gains will actually be
Applicant's Response	The assessment of the wider economic impacts of the scheme follows DfT TAG and uses the DfT WITA software. An input into the appraisal is the change in journey times as a result of the Project. These changes could be a decrease or

LIR Reference	Local Impact Report Extract / Applicant's Response
	an increase in travel times and the impact of congestion at certain locations is accounted for when the overall change in journey times is forecast by the Applicant's transport model.
Paragraph 3.76 Page 47	Affordability – costs of the project have risen significantly, as with all infrastructure projects, and in current economic circumstances this is a very expensive project without clear cut benefits
Applicant's Response	The decision as to whether to fund the Project or not is for DfT. The economic benefits of the Project are set out in the ComMA Appendix D: Economic Appraisal Package – Economic Appraisal Report [**APP-526**], and are greater than the costs of the Project.
Paragraph 3.77 Page 47	Value for money – the BCR in the application as submitted is weak, and considerable doubt has been cast by multiple sources on the reliability of the numbers
Applicant's Response	The BCR of the Project has been calculated using the methodology set out in DfT's Transport Appraisal Guidance. The BCR of the Project indicates that it provides "low" value for money if appraised over 60 years. For a 100-year appraisal, which is relevant for the Project as it is designed for an asset life of over 100 years, the Project's BCR is 1.72, which corresponds to the medium value for money category. The BCRs are set out in the ComMA Appendix D: Economic Appraisal Package – Economic Appraisal Report [**APP-526**]. It is often the case that larger schemes have lower BCRs than smaller projects because of the much higher costs. Furthermore, larger schemes provide the strategic infrastructure which enable other projects and benefits to be realised.
Paragraph 3.78 Page 47	Minimise impacts – any such scheme must have impacts they however considerable on the people and landscape of Gravesham.
Applicant's Response	The impacts of the Project on the people of Gravesham are reported in the: • Transport Assessment [**APP-529**] • ComMA Appendix D: Economic Appraisal Package – Distributional Impact Appraisal Report [**APP-525**] • Community Impact Report [**APP-549**] • ES Chapter 13: Population and Human Health [**APP-151**] • ES Chapter 7: Landscape and Visual [**APP-145**] • Health and Equalities Impact Assessment (HEqIA) [**APP-539**]
Paragraph 3.79 Page 47	Relieve the Dartford crossing – only short term relief is provided and the net result is increase in traffic which does not sit easily with the national climate change objectives

LIR Reference	Local Impact Report Extract / Applicant's Response
Applicant's Response	The Applicant has provided a detailed position on the need for the Project, including in relation to the effect of relief on the Dartford Crossing at Annex A to its Post-event submissions, including written submission of oral comments, for ISH1 [**REP1-183**]. The DCO has been developed in accordance with national guidance and latest policy in road user emissions. The Project's compliance and alignment with legislation, policy and plans relevant to climate are presented in ES Appendix 15.1: Climate Legislation and Policy [**APP-480**], and Planning Statement Appendix I: Carbon Strategy and Policy Alignment [**APP-504**]. The DCO application (ES Chapter 15: Climate [**APP-153**], and Carbon and Energy Management Plan [**APP-552**]) demonstrates how the Project is aligned to the National Highways' Net Zero Plan (and consequently to the government's own target for 2050), which sets ambitious targets for corporate emissions, maintenance and construction emissions, and road-user emissions, and follows a trajectory towards achieving net zero by 2050. The Project is committed to promoting low carbon innovation and approaches. On completion, it will be demonstrated that the Project has achieved its low emission aims and is aligned to the National Highways' Net Zero Plan's highways trajectory of a 40–50% reduction in emissions in the construction year 2030. This is a challenging target, and one that National Highways is committed to. The ES Chapter 15: Climate [**APP-153**], and Carbon and Energy Management Plan [**APP-552**] demonstrate how the Project has adopted market-leading practice to align with the emissions reduction trajectory required to achieve the government's 2050 aspirations. More information on how the Project aligns with the Transport Decarbonisation Plan is included within the Planning Statement and Carbon and Energy Management Plan. National Highways has completed a series of meetings between late 2021 to mid-2022 to discuss the Project's approach to climate and carbon, as well as wider innovative approaches being pursued by National Highways outside the DCO application.
Paragraph 3.80 **Page 47**	Resilience – an additional crossing logically increases resilience but the applicant has failed to provide substantive evidence that this would be the case given the stresses and strains on the network that will remain
Applicant's Response	The Project provides an alternative route to cross the Thames, thus providing resilience to the congested routes to the west. Not only does the Project provide an alternative crossing point, it also reduces the traffic using the existing crossing. Current traffic levels at Dartford remain largely consistent throughout a normal working day with a minimal reduction during the interpeak (the time between the morning and evening peaks). This lack of reduction in traffic flows throughout the day does not allow the existing crossing to recover from any incidents experienced throughout the day, thus causing significant delays across the surrounding network. Through the provision of an alternative route, the Project will reduce some of the traffic flows at Dartford and potentially reduce the risk of incidents and the time taken for the network to recover from incidents, therefore increasing journey time reliability.

LIR Reference	Local Impact Report Extract / Applicant's Response
Paragraph 3.81 Page 47	Safety – the new road will be to best modern standards (though with doubts over some elements of the design) but as it creates a major new road with complex junctions
Applicant's Response	This comment is noted – the Applicant considers that the design of the road is compliant with relevant design standards and safety and legibility has been accounted for within the design.
Paragraph 4.7 Page 48	**Construction Traffic** The core area is the box formed by Valley Drive, A226, A289, and A2, though there are implications further afield. This is also a context where perceptions count as some potential trips may be discouraged by the impression that the area is severely impacted even if it not at some times. This may affect leisure trips to places like Cobham, Shorne Woods Country Park, Jeskyns and Cascades Leisure Centre. In a slightly different category are visits to the Crematorium on the A226. Residents in the core area will have a much clearer idea of what is or is not possible at any given time.
Applicant's Response	Section 3.3 of the oTMPfC [**REP1-175**] provides details on how the Applicant and its Contractors will provide communication and community engagement measures, in order to tackle perceptions that may not reflect actual changes to the highway network, and thereby reduce the risk of behavioural changes materialising where practicable.
Paragraph 4.9 Page 48	**Construction Traffic** From the point of view of the core area affected directly the impact is going to be Major Adverse, along with all the other aspects like noise and disturbance that will go with the construction process. It is particularly severe when Brewers Road bridge is closed for its reconstruction.
Applicant's Response	The Traffic Management Plan (TMP) submitted as part of the application is illustrative in nature, as the exact traffic management plans will be determined and developed by the Contractors. However, the approach taken by the Contractors in developing the TMPs would be through consultation with all relevant stakeholders via the Traffic Management Forum. Additionally, the application documents set out the minimum requirements the TMP would address for each stakeholder category i.e. residents, businesses, schools etc. This approach offers a robust framework for developing the TMP in consultation with relevant stakeholders, as the details associated with the construction methodology develop. The use of diversion routes is often necessary as part of a road closure to facilitate the safe construction of the works. Table 4.5 in the oTMPfC [**REP1-175**] sets out proposed diversion routes as a start point for further discussion via the Traffic Management Forum, as stated in paragraph 4.7.3 of the same document: '*4.7.3 The diversion route would be determined through discussions with the local highway authority closer to the time as other factors may need to be taken into account to make the decision (e.g., other works in the nearby area which may be external from the Project works)*'.

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	Through the TMP and the Traffic Management Forum, when evaluating the suitability of a diversion route, the Contractor will discuss and carefully consider the potential impacts on sensitive receptors, including residential dwellings and other identified sensitive receptors, in close proximity to the local road network and implement appropriate mitigation measures where reasonably practicable. Such measures would be set out in the ES Appendix 2.2: CoCP [**REP1-157**]. This plan will encompass sensitive receptors, including residential areas impacted by the construction works, and outline a robust monitoring strategy. As committed in the REAC NV009 (ES Appendix 2.2: CoCP [**REP1-157**]) the Contractors will identify monitoring in consultation with relevant local planning authorities to ensure that the mitigation measures suggested are working effectively. The Contractor will implement a monitoring system capturing real-time traffic data to confirm effective traffic control measures and Temporary Traffic Management performance. Monthly compliance reports, based on traffic monitoring measures, will be provided to the Traffic Management Forum to assess activity and ensure adherence to specifications, guiding actions to resolve non-compliance and address complaints. This requirement is secured in the oTMPfC [**REP1-175**] and described in paragraphs 2.4.8 to 2.4.24 of the document. Specifying mitigation at this early stage, when the exact diversion routes and potential impacts are yet to be defined, would not be considered appropriate. Instead, a framework has been set to enable the relevant consultation with stakeholders to determine the suitability of diversion routes and appropriate mitigation measures, which is supplemented by a monitoring strategy to closely observe and identify areas that require improvement as a result of impacts, including diversion routes from temporary traffic management. This approach will enable the Contractor to take evidence-based decisions to implement tailored mitigation measures where appropriate. As set out within the SoCG [**REP1-100**] at item 2.1.72: '*The Applicant recognises that Brewers Road will be closed for a period of likely between 16-19 months, and this is necessary in order to demolish the existing structure and construct the new Green Bridge which is considered a positive measure and one agreed upon with Gravesham Borough Council. More information is provided on the justification for this closure in the Outline Traffic Management Plan for Construction which sets out that there would be an increase in journey times (around six minutes) due to the closure and diversion (via Three Crutches roundabout), but that access would be maintained through illustrative diversion routes, which are subject to refinement on engagement with relevant authorities (as other factors may need to be taken into account, such as other works in the nearby area at the time of closure)*'. In addition to measures set out in the ES Appendix 2.2: CoCP [**REP1-157**], the Contractor will secure Section 61 consent under the Control of Pollution Act 1974 (REAC NV004) at relevant stages of the project as necessary, which is outlined in Table 4.2 of the CoCP. In consultation with the relevant local authority, additional control measures will be agreed upon, to effectively manage potential disruptions and impacts resulting from the Project construction activities, including temporary traffic management and associated diversion routes. Such measures may include traffic calming

LIR Reference	Local Impact Report Extract / Applicant's Response
	measures and physical interventions such as acoustic barriers where these are proved to be necessary, effective and reasonably practicable. Construction noise associated with the Project has been assessed in accordance with appropriate UK guidance, BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. ES Chapter 12: Noise and Vibration [A**PP-150]** fully considers noise associated with the SouthePortal, as well as other construction works within the Gravesham area, as part of the study (including the implications of 24-hour working where necessary). This matter remains under discussion subject to Gravesham Borough Council's review of the CoCPCand wEAC (**REP1-157**]. Relating to issues surrounding construction traffic within the Gravesham area, full assessment on a yearly basis has been undertaken within the ES Chapter 12: Noise and Vibration [**APP-150**], and is presented within Section 12.6 paragraphs 12.6.41 to 12.6.49. Table 12.37 of Chapter 12 identifies, by year, where there is a potential for significant effects to occur based upon the traffic data supplied. The ES Figure 12.2: Construction Traffic Noise - Affected Links [**APP-310**] pages 1 and 2 detail the affected roads geographically within the Gravesham Area. These construction traffic impacts within Gravesham on the wider road network are temporary in nature, only occurring for the duration of the works in that area. As detailed within ES Chapter 12: Noise and Vibration [**APP-150**], significant effects associated with construction traffic have been identified within the ES but these predominantly occur on local minor roads around the Project where the existing flows are low, as detailed on ES Figure 12.2: Construction Traffic Noise - Affected Links [**APP-310**]. The roads presenting the potential for significant impacts tend to be lower speed roads, with impacts occurring at properties directly adjacent, which when coupled with the temporary short-term nature of the individual routing plans, means that provision of physical noise mitigation, such as low noise surfacing and acoustic screening, are not considered to be sustainable or proportionate measures. Specific control of construction traffic noise is therefore implemented through the ability to actively monitor and manage the flows around the network, allowing route changes and other control measures to be implemented to alter flow patterns of construction traffic where problems are identified. This would be managed through measures in Transport Assessment Appendix F: Wider Network Impacts Management and Monitoring Policy Compliance [**APP-535**], and oTMPfC [**REP1-175**].
Paragraph 4.10 **Page 49**	**Construction Traffic** Ask: Reading the material in the application the impression is obtained that National Highways and the contractors will engage together and then inform other interested parties what will happen. There must be a full engagement in advance with the Council, Kent County Council as highway authority, and other interested parties as relevant. This needs to cover both the local around the construction site but also the wider implications. For example, when the A2 is shut and diversions are in place via the M20.

<table>
<tr><th>LIR Reference</th><th>Local Impact Report Extract / Applicant's Response</th></tr>
<tr><td>Applicant's Response</td><td>The Applicant does not consider that this is a fair representation of the process that will be secured by the draft DCO [REP1-042] and Control Documents, which includes the local highway authority and local authority as a key consultee.</td></tr>
<tr><td>Paragraph 5.4 to 5.6
Page 50</td><td>Air Quality (Asks)
As part of the scheme, there is the offer for additional monitoring sites from Gravesham. Potential suggested monitoring locations based on the findings of the Air Quality Assessment and where there are existing gaps in Gravesham's existing Network are set out below.
Five potential locations are shown below for including monitoring at locations where there are predicted increases which are greater than 1% of the AQO for NO2 (i.e. 0.4µg/m³) and where there is not already existing monitoring.
Ideally, automatic monitoring stations would be installed through which live data could be recorded. An alternative would be for NO2 diffusion tubes to be installed at these locations.
<table>
<tr><th>Proposed Location ID</th><th>X</th><th>Y</th></tr>
<tr><td>1</td><td>564203</td><td>171307</td></tr>
<tr><td>2</td><td>562269</td><td>173026</td></tr>
<tr><td>3</td><td>566000</td><td>173814</td></tr>
<tr><td>4</td><td>565915</td><td>172142</td></tr>
<tr><td>5</td><td>567774</td><td>172759</td></tr>
</table></td></tr>
<tr><td>Applicant's Response</td><td>The air quality assessment presented within the ES Chapter 5: Air Quality [APP-143] has concluded that there are no significant effects on human health receptors. Furthermore, the Project does not delay compliance with the Air Quality Directive. No mitigation is therefore required in relation to these effects. Operational phase air quality monitoring is not required as there are no significant air quality effects, and no requirements for mitigation. The Applicant will however continue to engage with Gravesham Borough Council on their local air quality monitoring strategy.</td></tr>
<tr><td>Paragraph 6.1 – 6.4 (and paragraph 3.5 of Appendix 6)</td><td>Cultural Heritage
The main document of relevance is APP-144 6.1 ES – Chapter 6 – Cultural Heritage
There are extensive appendices including much survey information from investigative archaeological work. On this subject the Borough Council takes the lead on heritage assets and conservation areas, but looks to KCC for archaeological advice provided under a service agreement.
Appendix 6 contains a full report prepared internally on cultural heritage.
Section 7 of that report contains a list of suggested amendments or other measures to avoid, mitigate or compensate for the harms to Cultural Heritage that have been assessed.
Appendix 6 states, at paragraph 3.5, that:</td></tr>
</table>

LIR Reference	Local Impact Report Extract / Applicant's Response
	For the avoidance of doubt, the Council has concerns regarding the methodology employed by the applicant in undertaking the ES in relation to cultural heritage. In particular, the Council has concerns that: • The ES concentrates on harm to individual heritage assets and does not consider harm to cultural heritage 'in the round'; • The ES is not consistent with national policy in terms of the 'value' assigned to heritage assets or categorisation of 'harm'; and • The ES does not go beyond a high level Historic Landscape Categorisation (HLC) assessment to consider the importance of local landscape development at a more localised level
Applicant's Response	The methodology used by the Applicant in relation to cultural heritage is set out in Chapter 7 of the Environmental Impact Assessment – Scoping Report, and was accepted in the Scoping Opinion. Historic England (as the Government's adviser on all aspects of the historic environment in England) and Kent County Council have not challenged the methodology. In response to the matters summarised at paragraph 3.5 of Appendix 6: • Heritage assets have been considered by period and geographical region in ES Appendix 6.1: Cultural Heritage Desk-based Assessment [**APP-351** to **APP-354**], which provides an overarching assessment of the Project's heritage effects. The assessment of individual heritage assets is, however, entirely aligned with the relevant policy tests in the NPSNN at paragraphs 5.120 - 5.142 – which are definitive in requiring assessment of impact on heritage assets. • Paragraph 3.10 of Appendix 6 of the LIR outlines the WebTAG methodology for Economic Appraisal and suggests that this methodology should be used in the Environmental Impact Assessment. This is not appropriate. As set out in paragraph 1.3.3 of TAG unit A3 '…the appraisal recommended in this TAG Unit is not intended to be an alternative to, or a replacement for the environmental impact assessment. Rather, it is intended to complement that work'. In terms of value, GBC has concerns with the approach the Applicant has taken to use the criteria set out in DMRB LA 104 to assign value, based on the asset's international, national, regional and local significance. This differs from the NPSNN in two respects: firstly it separates out the very highest category of asset, the World Heritage Site, acknowledging that in order to be inscribed on the Register, UNESCO must judge the site to be of "outstanding value to humanity", as this is clearly a level of value beyond normal, it is appropriate to create a very high value category; and secondly, all nationally designated assets are assigned a high value, meaning that Grade II buildings are given a high value. But importantly, the difference in value does not change the implementation of policy and the decision over whether harm should be exceptional or wholly exceptional.

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	For designated heritage assets, the Applicant recognises that there can only be three categories of harm in policy terms: substantial harm; less than substantial harm; and no harm (and note that for heritage does not fully align with the "typical description" in Table 3.7 of DMRB LA 104). The Applicant has regarded the category of "less than substantial harm" to cover any harm below the level of substantial. This means that designated assets that have been assessed as having a slight effect are still regarded as experiencing a degree of harm. In order to ensure any designated asset experiencing "less than substantial harm" are considered, detailed descriptions of the impact on designated heritage assets where an effect that is not significant have been predicted, are included within ES Chapter 6: Cultural Heritage [**AS-044**]. • The ES does not go beyond a high level Historic Landscape Categorisation (HLC) assessment to consider the importance of local landscape development at a more localised level (Appendix 6, paragraphs 3.28 to 3.41). The Applicant believes the use of Historic Landscape Characterisation is proportionate and was set out in Chapter 7 of the Environmental Impact Assessment - Scoping Report and was accepted by PINs and not questioned in their Scoping Opinion. The draft Archaeological Mitigation Strategy and Outline Written Scheme of Investigation (AMS-OWSI) allows for additional research and recording of any historic landscape identified as part of the Project.
Paragraph 7.2 **Page 53**	**Landscape and Visual (Landscape)** A full report is contained in Appendix 7a which sets out the full landscape implications particularly on the Kent Downs Area of Outstanding Natural Beauty and its setting.
Applicant's Response	This comment is noted.
Paragraph 7.3 **Page 53**	**Landscape and Visual (Landscape)** Appendix 7b covers the impact of lighting and leads to set of asks and clarifications: • There is a more up to date version of British Standard BS 5489 released in 2020 than that cited in 6.3 Environmental Statement Appendix 8.15. This should be used when finalising lighting designs. • Construction lighting would also be designed, positioned and directed to prevent or minimise light disturbance to nearby residents, ecological receptors, as well as motorists and rail and marine operations. This provision would apply particularly to sites where night working or security lighting would be required. • It has been assumed that temporary lighting would include tower lighting, mounted on a mast up to a maximum height of 9m, though 3.2.2. of Appendix 8.15 states that these would be at 12m. This should be clarified. • A finalised lighting scheme has not been produced as the technology in lighting is expected to change between the time of the application and the likely time of installation of any lights. This is accepted but an appropriate condition

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	would be for the applicant to submit a detailed lighting design for each phase of works prior to each phase of construction. • Plate 4.11 of 6.3 Environmental Statement Appendix 8.15 – Construction and Operational Light Spill Calculations appears to show that there would be high lux levels at invertebrate sites at the South of River M2/LTC West Side. No conclusions or additional mitigation appear to be provided for this. It is not clear from the lighting assessment that values would be less than 0.5 lux at these sensitive sites with the vertical calculation figures provided with maximum vertical calculated values at Shorne Woods Ancient Woodland sites along the A2 being up to 59.2 lux. If the assessment is stating that this ancient woodland would exceed 0.5 lux at the first row of trees by the highway and then reduce to 0.5 lux as a result of the shielding effects of the trees behind this then it should be clarified that the effect on the first row of trees is not significant. • Plates 4.15 to 4.21 of 6.3 Environmental Statement Appendix 8.15 – Construction and Operational Light Spill Calculations shows the vertical light spill at bat roosts along the M2 corridor. It is not clear where the bat roosts are located on this figure. It is assumed that they would be at the top of the surface where lux levels are modelled to be below 0.5lux and thus unlikely to be affected. It would be beneficial to clarify this with the project ecologist. • 6.3 Environmental Statement Appendix 8.15 – Construction and Operational Light Spill Calculations includes light spill calculations for proposed construction compounds within Gravesham. These show that there would be minimal light spill on to sensitive receptors. Figures in Appendix 8.15 (3.3 to 3.7) at 30m the lux value would be 0.5lx. It would be good to confirm that no sensitive species would be present within 30m.
Applicant's Response	The applicant acknowledges the continuous development in lighting technology and the design of the final lighting design will be to the current standards, and the lighting design principals set out in Section 4.6 of the Design Principles [**APP-516**] – with PRO.02 being particularly relevant. The requirements for lighting during construction are set out in Section 6.8 and Table 7.1 of the ES Appendix 2.2: CoCP [**REP1-157**]. Impacts from light spill on sensitive ecological receptors is reported in ES Chapter 8: Terrestrial Biodiversity [**APP-146**]. This includes consideration of lighting disturbance on terrestrial invertebrates and bats (see paragraphs 8.6.75 - 8.6.76 and 8.6.140 - 8.6.146, respectively, for an assessment of likely significant effects south of the River Thames during the Project's construction; and paragraphs 4.6.452 - 8.6.454 and 8.6.471 - 8.6.473 for an assessment of likely significant effects south of the River Thames during the Project's operation). Section 8.6 as a whole, addresses where lighting disturbance is a potential impact pathway on all relevant ecological receptors in addition to terrestrial invertebrates and bats.

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Paragraph 7.4 Page 54	**Landscape and Visual (Landscape)** The Council regards the landscape impacts as major adverse and in the main it is not possible to deal with these by mitigation but requires compensation.
Applicant's Response	Paragraph 7.9.22 of ES Chapter 7: Landscape and Visual [**APP-145**] concludes that: '*the Project would result in a combined moderate adverse significance of overall landscape and visual effect on the existing landscape and visual amenity'*. The conclusion on overall effects takes account of the extensive mitigation measures proposed, including false cuttings, new planting, green bridges and the provision of substantial new areas of landscaped open space at Chalk Park adjoining the South Portal, and Tilbury Fields adjoining the North Portal.
Paragraph 7.10 Pages 54/55	**Landscape and Visual (National Policy and Definitional Harm)** Whilst the main works comprise engineering operations that could be covered by the exemption under paragraph 150(b), their scale and extent is such that they would not preserve openness and would conflict with the 5 stated purposes for including land within the Green Belt. Whilst parts of the proposal form local transport infrastructure, the primary elements of the project are intended to be part of the Strategic Road Network (SRN) for which Development Consent is required. The proposals therefore fall outside the exemption under paragraph 150(c), notwithstanding that they do not preserve openness and conflict with the 5 purposes of Green Belts. Similarly, paragraph 150(e) in respect of material changes of use of land would not apply.
Applicant's Response	The Applicant acknowledges that whilst there are elements of the Project that are not inappropriate in the Green Belt if they were considered on their own, it is considered that the Project as a whole does not fall within the exceptions identified in paragraph 149 or 150 of the NPPF (paragraph E.5.3 of Planning Statement Appendix E: Green Belt [**APP-500**]. The Project constitutes inappropriate development in the Green Belt, and, as such, it is required to demonstrate "very special circumstances" as set out in Planning Statement Appendix E: Green Belt [**APP-500**].
Paragraph 7.12 Page 55	**Landscape and Visual (National Policy and Definitional Harm)** Beyond 'definitional harm', it is also necessary to consider the actual harm of the proposal in Gravesham (and elsewhere) on Green Belt openness and the 5 purposes of including the land in the Green Belt. In undertaking this exercise, the Borough Council has had regard to its Stage 1 Green Belt Study (April 2018) and the more detailed Stage 2 Green Belt Study (August 2020).
Applicant's Response	This comment is noted.
Paragraph 7.15 Page 55	**Landscape and Visual (Actual Harm to Openness)** The remainder of the A122 southwards from the tunnel portal to the A2 junction would however be above ground and have a spatial presence. Elements of the structures would be highly visible, particularly the A2/A122 junction in both

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	day and nighttime. Whilst much of the A122 approach road to the tunnel portal would be in cutting or false cutting and would benefit in the longer term by landscape mitigation, it would still have a spatial presence and would be potentially visible from different vantage points. It is also important to recognise that in terms of the visual dimension of openness, it is not only people in the surrounding area that might see it but also the people using the road itself. Given over time these would number in the millions, this is an important consideration.
Applicant's Response	The Applicant's assessment of potential harm to the openness of the Green Belt is set out in Section E.6 (paragraphs E.6.15 to E.6.26) of Planning Statement Appendix E: Green Belt [**APP-500**]. Design measures proposed to reduce that harm are described in paragraph E.6.27 (points a. – k.).
Paragraph 7.16 **Page 55**	**Landscape and Visual (Actual Harm to Openness)** In terms of the A2 corridor, the proposal would have a spatial impact on openness due to the construction of the complex multi-layered junction and associated local access roads. Whilst efforts have been made to maintain the width of the main corridor through the AONB, to the east of Thong Lane, the increase in the number of running lanes on the approaches to the junction and loss of existing planting to be replaced by highway will have an impact both spatially and visually. Once again, notwithstanding proposed mitigation, the loss of visual openness will be experienced by those having sight of the road and those using the road itself. It should be noted that loss of spatial openness does not depend on the road being visible.
Applicant's Response	See response to paragraph 7.15 of the Council's LIR above.
Paragraph 7.17 **Page 55**	**Landscape and Visual (Actual Harm to Openness)** Given the roads are intended to be used by vehicles and that their numbers will increase over time, their presence and impact will also impact on openness.
Applicant's Response	See response to paragraph 7.15 of the Council's LIR above.
Paragraph 7.18 **Pages 55/56**	**Landscape and Visual (Actual Harm to Openness)** Other aspects of the proposals (including the relocation of pylons, associated tunnel infrastructure, highway paraphernalia and alterations to the public rights of way network) are also likely to impact on openness both spatially and visually. This is particularly the case with the proposed improved public right of way, to the south of the CTRL/HS1 and to the east of Brewers Road, where the existing footpath is narrow and unsurfaced and rural in character.
Applicant's Response	See response to paragraph 7.15 of the Council's LIR above.

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Paragraph 7.19 Page 56	**Landscape and Visual (Actual Harm to Openness)** Overall, it is considered that the proposals south of the River Thames would not preserve openness and that the actual impact on openness in both spatial and visual terms would be severe. Whilst the proposed landscaping and planting may (over time) assist in mitigating these impacts, the level of harm would remain extremely high.
Applicant's Response	See response to paragraph 7.15 of the Council's LIR above.
Paragraph 7.20 Page 56	**Landscape and Visual (Conflict with Purposes of Green Belt)** The applicant does not appear to have undertaken a formal assessment of the Green Belt affected by the Project to inform consideration of potential conflict with the purposes of including land in it. Whilst reference is made to studies commissioned by the Borough Council and others, it is unclear how they have informed the applicant's assessment. For the purposes of this LIR, consideration of conflict with Green Belt purposes uses the Gravesham commissioned studies as a starting point. This is intended to provide consistency of approach between the emerging Local Plan and the assessment of the project.
Applicant's Response	The Applicant provides a complete assessment of the Project against the relevant planning policy relating to its location within the Green Belt in Planning Statement Appendix E: Green Belt [**APP-500**], including an assessment of potential harm to the Green Belt by considering the Project against five purposes the Green Belt serves (as set out in paragraph 138 of the NPPF) at paragraphs E.6.8 to E.6.14. The consideration of route alternatives presented in Chapter 5 of the Planning Statement [**APP-495**] and ES Chapter 3: Assessment of Reasonable Alternatives [**APP-141**], demonstrates that Green Belt designation was considered in the route optioneering process. Paragraph E.7.17 of Planning Statement Appendix E: Green Belt [**APP-500**] concludes that '*there are no viable, feasible or deliverable alternative solutions for the provision of a crossing of the River Thames to the east of London that are located outside of the Green Belt*'.
Paragraph 7.25 Page 56	**Landscape and Visual (Conflict with Purposes of Green Belt)** In respect of the harm to Green Belt purposes 1-3, the Stage 1 study concluded that land within parcels listed in paragraph 1.19, all made a significant contribution to at least 1 of Green Belt purposes 1 - 3, with parcels 2, 6 and 7 making a significant contribution to all three purposes and parcels 8 and 11a making a significant contribution to 2 purposes.
Applicant's Response	Noted. See the Applicant's response to paragraphs 7.10 and 7.20 of the Council's LIR above.

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Paragraph 7.27 **Pages 56/57**	**Landscape and Visual (Conflict with Purposes of Green Belt)** In respect of the harm to Green Belt purposes 1 -3, the Stage 2 Study concluded that where land was relatively self-contained and/or close to the urban edge (parcels GR3, GR4 and GR5), the level of harm to Green Belt purposes through development was considered moderate to low moderate. This increased to high and moderately high levels of harm moving into more open countryside, east of Thong Lane as shown on the plan below (parcel GR7 and GR9).
Applicant's Response	Noted. See the Applicant's response to paragraphs 7.10 and 7.20 of the Council's LIR above.
Paragraph 7.29 **Page 57**	**Landscape and Visual (Conflict with Purposes of Green Belt)** However, should Development Consent for the construction of the Project be granted, this would not in itself be sufficient to constitute 'exceptional circumstances' to remove land from the Green Belt in this location as that is a separate Local Plan issue. The road would continue to pass through Green Belt with no change to the policy status of the land. Given the constraints on development that the Project would bring due to the mitigations and compensation sites, there is also no guarantee that land would be released for development in the future and the potential for the road to form a new Green Belt boundary is not of relevance.
Applicant's Response	Noted. See the Applicant's response to paragraph 7.10 of the Council's LIR above.
Paragraph 7.30 **Page 57**	**Landscape and Visual (Conflict with Purposes of Green Belt)** For the sake of completeness, the corresponding plan from the Stage 2 Green Belt Study with the Project in place is reproduced below. It will be noted from both plans that the alignment of the Project in Gravesham runs through areas which the study concludes would result in High/Moderate High levels of harm to one or more purposes of the Green Belt, should development occur. The only difference would be in parcel GR6a, to the south of Riverview Park, which because of the containment caused by the road would fall to a moderate level of harm. However, this would not be suitable for future development because of proximity to the road and the need for the Project to provide mitigation. This parcel would also be affected by both overhead powerlines and high-pressure gas pipelines, both of which would impose additional constraints.
Applicant's Response	Noted. See the Applicant's response to paragraphs 7.10 and 7.20 of the Council's LIR above.
Paragraphs 7.31 to 7.36 **Pages 58/59**	**Landscape and Visual (Conflict with Purposes of Green Belt)** The following paragraphs adopt a similar approach to the Gravesham Stage 1 and Stage 2 Green Belt Studies to consider the potential conflict of the Project with Green Belt purposes. **Purpose 1** is to check the unrestricted sprawl of large built-up areas. Whilst the land to the east of Thong Lane and south of Riverview Park contributes to this purpose to various degrees, the Project is not considered to represent an

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	'unrestricted sprawl of a large built-up area' in itself. This is a project specific intervention rather than an unplanned extension to the Gravesham urban area. **Purpose 2** is to prevent neighbouring towns merging into one another. Whilst the Project would lie between the eastern edge of Gravesend, in open countryside, between it and the neighbouring town of Strood in Medway and would cause some loss of separation between the towns, it would not undermine the purpose of preventing neighbouring towns merging into one another. **Purpose 3** is to assist in safeguarding the countryside from encroachment. This is considered relevant in this instance because the Project represents a significant intervention in an area of largely open countryside. The proposals will therefore cause harm in this respect and conflict one of the key purposes of including this land in the Green Belt. **Purpose 4** is to preserve the setting and special character of historic towns. Whilst Gravesend is an historic riverside town, the land affected by the Project does not contribute in this respect. The intention of including this purpose in national guidance was specifically intended to relate to a limited number of historic towns, including York, Chester, Bath, Oxford, Cambridge and Durham and not Gravesham, hence both Green Belt Studies determined that land in the Borough designated as Green Belt made no contribution to this purpose. **Purpose 5** is to assist in urban regeneration, by encouraging the recycling of derelict and other urban land. On this, the Gravesham Stage 2 Green Belt Study (August 2020) concludes that all Green Belt contributes towards this objective equally. However, this should not be taken to mean that the applicant should not demonstrate that reasonable alternatives outside the Green Belt or those which may cause less harm to Green Belt purposes, have been properly considered through the DCO process.
Applicant's Response	Noted. See the Applicant's response to paragraph 7.20 of the Council's LIR above.
Paragraph 7.37 **Page 59**	**Landscape and Visual (Other Harms)** The proposals will clearly result in 'other harms' that will need to be taken into consideration when it is assessed against Green Belt policy. These are discussed elsewhere within this document under specific headings. It is also noted that in several instances the applicant accepts that the impact of 'other harms' will be severe. For the avoidance of doubt, the Council considers that the following 'other harms' should be factors within the planning balance: • Impact on landscape • Impact of cultural heritage • Impact on irreplaceable habitat + natural environment • Noise and light impacts, particularly within the vicinity of the A122 and the A2 junction.

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Applicant's Response	The Applicant acknowledges that the demonstration of "very special circumstances" requires consideration of potential harm to the Green Belt by reason of inappropriateness and "any other harm". Paragraphs E.6.25 to E.6.26 of Planning Statement Appendix E: Green Belt [**APP-500**], notes that the Project is considered to result in "other harm" as there will be likely significant effects of the Project. ES Chapter 17 [**APP-155**] summarises the likely significant effects of the Project and these are listed at paragraph E.6.26 for the purposes of demonstrating "very special circumstances". These are summarised in paragraphs 8.7.14 to 8.7.30 of the Planning Statement [**APP-495**], which addresses the overall "planning balance" of NPSNN paragraph 4.3 including: • Landscape and visual (paragraph 8.7.14) • Kent Downs AONB (paragraph 8.7.15); • Biodiversity (paragraphs 8.7.16 and 8.7.17) • Historic environment (paragraphs 8.7.18 to 8.7.21) • Land quality (paragraph 8.7.22) • Flood risk (paragraph 8.7.23) • Open space and recreation (paragraph 8.7.26) • Waste management (paragraph 8.7.27) • Noise and air quality (paragraph 8.7.28 to 8.7.30) Accordingly, there is an extensive and comprehensive assessment of all "other harms" in the context of paragraph 5.178 of the NPSNN before the Secretary of State, in order to allow and full and proper consideration of "other harms" in judging the demonstration of "very special circumstances".
Paragraph 7.38 **Page 59**	**Landscape and Visual (Other Harms)** Adverse impacts on the Public Rights of Way network – including severing links across the land to the west of Thong and the loss of the footpath cycleway adjacent to the A2 northern carriageway to the east of Thong Lane. Whilst the Applicant proposes mitigation, the alternatives would be less commodious and therefore a level of harm would persist.
Applicant's Response	As set out within the SoCG [**REP1-100**] at items 2.1.112 and 2.1.113: '[The Applicant notes that] *ES Chapter 13 Population and Human Health* [**APP-151**] *sets out the effects of construction works on PRoWs.*

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	This sets out that 15 PRoWs (including NCR 177) would be affected during this time, in most cases resulting in route diversion to maintain connectivity (albeit with an increase in journey length) and in some cases resulting in intermittent closures or interference, temporary closures and some permanent closures. *Any diversions have been assessed in line with DMRB LA 112*'. (item 2.1.112) With specific reference to NCR 177: '*National Highways has identified that NCR 177 between Gravesend East junction and the Park Pale bridge over the A2 would initially be affected by utility works. The route would also be permanently closed to accommodate the new M2/A2/A122 Lower Thames Crossing junction. Upgrades to existing footpaths and tracks would be undertaken prior to the closure of the existing NCR177 alignment to ensure that a suitable alternative route is available; once works are complete an alternative roadside route would be available as a permanent diversion.* *This is assessed within ES Chapter 13 Population and Human Health...* *…The Applicant considers that these are not significant in terms of affecting their level of use by cyclists in terms of the overall distances typically travelled by cyclists using the route; both the temporary and permanent diversion routes allow for improved user experience*'. (item 2.1.113)
Paragraph 7.39 **Page 59**	**Landscape and Visual (Other Harms)** Harm through inappropriate mitigation – the Council argues elsewhere that the proposed mitigation to the east of Thong and the creation of mosaic habitat here is damaging to cultural heritage and has been inadequately justified.
Applicant's Response	See response to paragraph 7.37 of the Council's LIR above. The land east of Thong is required to provide mitigation for both common reptiles and to mitigate construction impacts to terrestrial habitat for great crested newts (GCN). This requires the provision of mitigation ponds to be located within the core home range of the GCN population in Shorne Woods Country Park. This limits site selection to an area that's within a 250m radius of GCN breeding ponds and outside of any proposed construction activities. The pond locations and general mitigation strategy has been agreed with Natural England, and the Project is in receipt of a LoNI (letter of no impediment) for the draft European protected species licence application for GCN. Taking a proportionate approach to land acquisition for ecological mitigation, the Applicant has also selected this site for habitat creation to support common reptiles, as they share similar/complimentary terrestrial habitat requirements to GCN. The Thong Rural Conservation Area Appraisal published in 2017 states that '*the village's eastern setting is open land sweeping up to the skirts of Shorne Woods. The Woods, on rising ground, give complete 'middle distance' enclosures on this side of the village*'. The proposed Thong open mosaic habitat creation, is described in the outline Landscape and Ecology Management Plan (oLEMP) [**REP1-173**] as consisting of '*rough grassland, ponds, and patches of bare earth, with scrub*

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	blending into the adjacent woodland of Shorne Wood. Habitat would be planted as a patchwork rather than large areas of similar habitat' [**REP1-173**], and would not compromise this historic setting to the east of the Conservation Area.
Paragraph 7.40 **Page 59**	**Landscape and Visual (Other Harms)** Ongoing impact and harm to the local community through the presence of the road during the operational phase.
Applicant's Response	See response to paragraph 7.37 of the Council's LIR above.
Paragraph 7.41 **Page 59**	**Landscape and Visual (Other Harms)** Whilst the focus of this part of the LIR is on long-term operational impacts, there will be 'other harms' during the construction phase that the Examining Authority (ExA) will be obliged to consider under Green Belt policy, even if these are only 'temporary'. On this, it is important to recognise that these impacts on the local community are likely to be severe and of significant duration.
Applicant's Response	See response to paragraph 7.37 of the Council's LIR above.
Paragraph 7.42 **Page 59**	**Landscape and Visual (Description of Very Special Circumstances)** It is for the applicant to set out whether sufficient 'very special circumstances' exist that clearly outweigh harm to the Green Belt and any other harms. For the avoidance of doubt, the Borough Council finds the evidence provided to date is unconvincing and lacks both clarity and rigour. It is not therefore considered an adequate basis upon which the ExA can arrive at an appropriate planning balance to make a recommendation to the Secretary of State.
Applicant 's Response	As set out within the SoCG [**REP1-100**] at item 2.1.5, the Applicant considers that the implications of the Project on Green Belt in policy terms have been considered appropriately in Planning Statement Appendix E: Green Belt [**APP-500**], and that the Project demonstrates "very special circumstances" that clearly outweigh both definitional and actual harm when compared to such alternatives. Planning Statement Appendix A: NPSNN Accordance Table [**APP-496**] addresses the effects of the Project on the Green Belt from a policy perspective.
Paragraph 7.43 **Page 59**	**Landscape and Visual (Description of Very Special Circumstances)** For example, APP-500: 7.2 Planning Statement – Appendix E - Green Belt consistently refers to the Green Belt in the context of the assessment of impacts on landscape character. However, Green Belt is a policy designation and should be assessed separately in its own terms. The impacts on landscape character, in combination with any other harms caused by the project are additional factors to the harm to the Green Belt but the applicant does not treat them as separate 'other harms'.

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Applicant's Response	As set out within the SoCG [**REP1-100**] at item 2.1.5, the Applicant considers that the implications of the Project on Green Belt in policy terms have been considered appropriately in Planning Statement Appendix E: Green Belt [**APP-500**], and that the Applicant has demonstrated "very special circumstances" that clearly outweigh both definitional and actual harm when compared to such alternatives. Planning Statement Appendix A: NPSNN Accordance Table [**APP-496**] addresses the effects of the Project on the Green Belt from a policy perspective. The ES Chapter 7: Landscape and Visual [**APP-145**] considers the effects of the Project on the landscape, including relevant landscape designations.
Paragraph 7.44 **Pages 59/60**	**Landscape and Visual (Description of Very Special Circumstances)** In addition, visual harm is only considered in the context of impacts of the project from the outside in looking in. However, as noted above, the project will remain in the Green Belt and impacts of visual harm will be experienced by the millions of people travelling on the roads themselves. Impacts of the project in terms of spatial and visual openness are therefore likely to be severe when considered from the user's perspective.
Applicant's Response	See response to paragraph 7.43 of the Council's LIR above.
Paragraph 7.45 **Page 60**	**Landscape and Visual (Description of Very Special Circumstances)** As noted above, the assessment of the harm to openness and conflict with Green Belt purposes is not underpinned by any methodology to provide an understanding as to how the conclusions have been reached. Whilst reference is made to local Green Belt assessments, it is not evident how they have informed the conclusions reached by the applicant.
Applicant's Response	The methodology for demonstrating accordance with policy as set out in the NPSNN is set out in Planning Statement Appendix E: Green Belt [**APP-500**], which has informed the conclusion reached by the Applicant.
Paragraph 7.46 **Page 60**	**Landscape and Visual (Description of Very Special Circumstances)** Further, the Council would question the conclusion reached at paragraph E.6.12 of APP-500: 7.2 Planning Statement – Appendix E - Green Belt that the proposed delivery of open space and woodland etc. and assists in safeguarding the countryside from encroachment. To the south of the River Thames most of the route from the A2 to the tunnel portal runs through open countryside. Replacing this with an alternative may bring a range of other benefits in terms of improved public access or ecology but in Green Belt terms and safeguarding the countryside from encroachment, the effect of such mitigation is broadly neutral because it is already countryside. In addition, where improvements are not made directly by the Project itself but through the National Highways Designated Funds route, they should be discounted unless the cost is fully factored into the calculation of the BCR.

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Applicant's Response	Paragraph E.6.27 of Planning Statement Appendix E: Green Belt [**APP-500**] also identifies a number of other design measures proposed to reduce harm to the Green Belt and "other harms".
Paragraphs 7.47-7.49 Page 60	**Landscape and Visual (Description of Very Special Circumstances)** In assessing whether very special circumstances exist that clearly outweigh harm to the Green Belt, the Council would suggest that two tests should be applied: The first is a relative test. Whilst the NPSNN accepts that some parts of linear infrastructure will need to occupy Green Belt locations, it is still necessary to consider the relative harm of reasonable alternatives against relative benefits. Without this, very special circumstances that clearly outweigh harm will not have been properly considered for the preferred option. It is necessary therefore for the applicant to evidence how it has assessed those relative levels of harm against benefits as a process in developing the project and how this has been consulted on in a transparent way. This would include the Dartford alternative, where the rationale for excluding it as not meeting scheme objectives also needs to be evidenced. The second is an absolute test - even if the project is the best or only option in terms of achieving outcomes in relation to scheme objectives, the applicant must still provide sufficient evidence to show that the benefits clearly outweigh the harm. Just because an option is the only one available does not mean that it is acceptable when evaluated against policy – it can still be refused Development Consent.
Applicant's Response	See response to paragraph 7.43 above. The Applicant considers that the approach taken to the consideration of Green Belt impacts, including the consideration of "very special circumstance"' as described in Planning Statement Appendix E: Green Belt [**APP-500**] is proportionately appropriate and accords with Government Policy. The Applicant also demonstrates how it accords with NPSNN policy on Green Belt on pages 177 and 181-182 of Planning Statement Appendix A: NPSNN Accordance Table [**APP-496**].
Paragraphs 7.50 – 7.54 Pages 60/61	**Landscape and Visual (Description of Very Special Circumstances)** Whilst the Council has not specifically raised 'reasonable alternatives' as a key issue, this is particularly relevant to Green Belt because of the need to demonstrate 'very special circumstances' that clearly outweigh harm. In this instance, whilst the applicant has gone through a long process of consultation and engagement and sifted what it considers to be 'reasonable alternatives', the Green Belt issue never featured strongly as something that needed to be addressed other than the applicant effectively assuming the national need for the Project would outweigh any Green Belt harm. For example, following the preferred route choice in 2016, National Highways published a Lower Thames Crossing: Response to Consultation document in 2017 which simply stated at page 38 that they had considered the Project against national policy and believed the national need would satisfy any policy tests (see -

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	https://highwaysengland.citizenspace.com/ltc/consultation/supporting_documents/Highways%20Englands%20Response%20to%20Consultation.pdf). This was repeated at the 2018 Statutory Consultation stage at 8.4.3 of the Case for the Project document, where it was simply stated (without any justification) that National Highways was confident that the strength of the case for the Project would ensure that the policy tests would be met (see – https://highwaysengland.citizenspace.com/ltc/consultation/supporting_documents/LTC%205%20The%20Case%20for%20the%20Project.pdf) Whilst it is noted that the applicant's document APP-141: 6.1 Environmental Statement - Chapter 3 - Assessment of Reasonable Alternatives sets out how Green Belt was considered at each stage of the process, this was only in terms of stating where it would be affected with no assessment of alternatives against openness or purposes. There appears to have been no formal assessment against policy or any indication of the weight to be accorded the protection of Green Belt compared to performance against scheme objectives. In determining what are considered 'reasonable alternatives', the Council accepts that these must be capable of achieving the scheme objectives. These are set out at Table 4.1 of APP-495: 7.2 Planning Statement and are reproduced below. On the above, it will be noted that none of the above scheme objectives are given a particular priority or weighting. In addition, there is no requirement under the scheme objectives for any performance threshold to be met by which a particular option should be discounted. There is therefore no requirement under the scheme objectives that the best performing option, particularly in monetised terms, should be selected when considered against environmental constraints or other policy objectives.
Applicant's Response	The Applicant considers that the approach taken to the consideration of Green Belt impacts, including in terms of the consideration of reasonable alternatives, as described in ES Chapter 3: Assessment of Reasonable Alternatives [**APP-141**]; Chapter 5 of the Planning Statement [**APP-495**]; and in Planning Statement Appendix E: Green Belt [**APP-500**], is proportionately appropriate and accords with Government Policy, as demonstrated on pages 171 and 181/182 of Planning Statement Appendix A: NPSNN Accordance Table [**APP-496**].
Paragraphs 7.55 – 7.58 Pages 61/62	**Landscape and Visual (Description of Very Special Circumstances)** With reference to resilience, it is noted that the applicant makes the case for the project in document APP-494: 7.1 Need for the Project. However, whilst the Project would provide an additional crossing point over the Thames to the east of London and increased capacity, no substantive evidence appears to have been provided to demonstrate the relative performance of this project against reasonable alternatives.

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	This is important in terms of the 'very special circumstances' case because it is necessary to know whether the benefits of an additional crossing in terms of resilience are capable of being realised given linking highways have limited capacity. The applicant appears to admit that the project will only be a partial solution to the issue of resilience, allowing traffic to disperse more quickly once an incident is over. However, no robust evidence appears to have been provided to test this beyond supposition and actual impacts on the local highway network remain unknown. In addition, it is legitimate for people affected by the proposal to know what the implications are should an incident occur at either crossing or on the SRN linking them in terms of local highway impacts. Given the Dartford option was ruled out on the basis that an additional crossing further downstream would be a more resilient solution than providing additional capacity at the existing location, the Council contends that the ExA needs to know what the differences would be and whether these are sufficient to constitute very special circumstances that clearly outweigh harm.
Applicant's Response	The Applicant considers that the "resilience" benefits of the Project are adequately demonstrated in the Need for the Project [**APP-494**], and are sufficient alongside the other benefits described to constitute "very special circumstances" to justify the location of the Project in the Green Belt.
Paragraphs 7.59 – 7.66 Page 62	**Landscape and Visual (Description of Very Special Circumstances)** Beyond this, another of the scheme objectives is to achieve value for money. In assessing the project and compiling the business case, the applicant has followed the NPSNN (2014) at paragraph 4.5 by using a WebTAG based approach. This applies two different types of approach based on whether impacts (positive or negative) can be monetised. Non-monetised costs and benefits should be considered by qualitative assessments, for example by applying an Environmental Capital approach. Whilst scheme promoters are advised not to rely solely on the monetised elements to justify projects, this part is used to calculate the project's Benefit Cost Ratio (BCR). The aim of this is not only to determine whether a project is value for money, but so different schemes can be compared against a level playing field in a Treasury Green Book compliant way. A large proportion of the benefits of the project are derived from the monetary value of accumulated time savings over millions of journeys that result from the project. Aside from the issue of whether small savings of time should actually be counted, to arrive at this monetary value, WebTAG assigns a value to time on the basis of 'willingness to pay' for units of time saving for different types of journeys. At a basic level of comparing one project against another using the central (or average) value of 'willingness to pay' is generally acceptable because any variance would be the same for each project – thus ignoring any spatial variations that may occur due to the location of a project and likely users.

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	However, WebTAG Unit A1.3 on User and Provider Impacts (May 2022) at section 4.2 sets out that there is considerable variation in the willingness to pay and that sensitivity testing should be undertaken to reflect this. This is because the true value of time based on the willingness to pay may lie within quite a wide range. At a 95% confidence level for work-based trips (excluding professional or freight drivers) the sensitivity range suggested is +/- 25% and for non-work based trips, +/-25% for commuters and +/-60% for other non-work based trips. The applicant does not appear to have undertaken this form of sensitivity testing. Given the applicant is required to demonstrate 'very special circumstances' that clearly outweigh harm, to overcome any Green Belt policy objection and the true value of time may be at the lowest end of the sensitivity testing range, it is arguable that this should be used to calculate a 'worst case' BCR for the project. Without this information, it is difficult to see how the ExA can reach a legitimate planning judgement as to whether the proposal meets the 'very special circumstances' test whereby the benefits of the scheme clearly outweigh harm.
Applicant's Response	In terms of TAG sensitivity testing regarding the value of time, the Applicant has responded to Gravesham Borough Council within Annex H.2 of the Annexes to Post-event submissions, including written submission of oral comments, for ISH1 [**REP1-183**]. In other regards, the Council is confident that its justification of "very special circumstances" as set out in Planning Statement Appendix E: Green Belt [**APP-500**] is reasonable and robust.
Paragraphs 7.67 – 7.68 Pages 62/63	**Landscape and Visual (Conclusion on Green Belt Issues)** The Council concludes that the project is inappropriate development in the Green Belt, which is 'by definition 'harmful' and which should only ever be permitted where the applicant demonstrates very special circumstances that clearly outweighs harm to the Green Belt and any other harms. The Council has identified significant actual harm to the Green Belt resulting from the Project and conflict with the Green Belt purpose of safeguarding the countryside from encroachment. Significant other harms have also been identified. Whilst the applicant claims very special circumstances that clearly outweigh harm exist, the case put is unconvincing and has not in the view of the Council been properly evidenced. Based on the supporting evidence provided to date, the Council is concerned that the ExA will not be in a position to arrive at a sound planning balance on this matter when making a recommendation on the application. Ask: The applicant complete a Green Belt assessment that complies with the requirements of the NPPF (and therefore NPSNN) taking into account the matters the Council has set out.
Applicant's Response	See response to paragraphs 7.50 – 7.54 of the Council's LIR above.

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Paragraphs 8.5 – 8.8 Pages 64/65	**Terrestrial Biodiversity (Habitat Loss)** ES para 8.6.9 says about habitat loss: *the widening of the A2, along with the unavoidable utilities diversions and the construction of green bridges in this area, would lead to a permanent loss of 5.85ha (2.9%) of habitat within Shorne and Ashenbank Woods SSSI, of which 0.95ha (0.9%) is designated ancient woodland within Shorne and Brewers Woods SSSI. Non-woodland habitat from between the A2/M2 and High Speed 1 (HS1) including landscape planting would be lost from south of the A2/M2.* ((The reference to Brewers Woods is typo as Brewers Wood is the part of Shorne and Ashenbank Woods SSSI east of Brewers Road). The project would also result in the permanent removal of semi-natural broadleaved and plantation woodland, hedgerows, scrub habitats of County Importance, calcareous, species-poor semi-improved and improved grasslands, open mosaic habitat, swamp and marginal vegetation, arable land, ponds and streams and temporary loss of coastal and floodplain grazing marsh. Kent Wildlife Trust has commented (Relevant Representation RR-0560) that the project will see the displacement of species through direct habitat loss and fragmentation and increase wildlife roadside mortalities, including the direct mortality and loss of habitat containing county-level important macro-invertebrates. • Barbastelle, one of the UK's rarest species of bat, was recorded during a bat transect in Brewers Wood. Barbastelle have never been confirmed in Kent, therefore any passes and potential roost sites in Kent are a significant find. The proposal will therefore have a highly significant impact on the local ecology from its physical footprint as well as any wider impacts. These are compounded by the relationship with heritage and landscape in the Kent Downs AONB. The impact can be assessed as MAJOR ADVERSE.
Applicant's Response	The Applicant has altered the design to minimise the footprint of the road itself through the AONB. The lanes of the A2 previously shown as widening the corridor, would now be within the existing highway boundary and would not impact Shorne Woods Country Park. Revisions to the requirements of construction and utility diversions have further reduced the loss of ancient woodland. The Applicant's position is that where possible, the loss of veteran trees and ancient woodland should be avoided. Commitment LV001 of the REAC (in Chapter 7 of ES Appendix 2.2: CoCP [**REP1-157**]) mandates an aim for the detailed design for the Project, including diverted utilities, to reduce the removal of trees and vegetation as far as reasonably practicable. This includes potential veteran trees. The Applicant has worked to avoid impacts, but where they are unavoidable, has sought to design a compensatory package of planting and other measures, in discussion with Gravesham Borough Council, the Kent Downs AONB unit, Kent County Council, the Forestry Commission and Natural England. Detail of habitat loss and gain as a result of the Project is given at Table 8.31 in ES Chapter 8: Terrestrial Biodiversity [**APP-146**]. The assessment of likely significant effects on these habitats and associated species they support in provided in section 8.6. The baseline includes a record for one barbastelle bat (*Barbastella barbastellus*) pass recording

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	during a transect survey of Brewers Wood. Given the unexpected nature of this record, subsequent analysis of the sonograph using Kaleidoscope software has been undertaken, and it is no longer thought that this record should be attributed to this species. Instead, it is considered more likely to be a common pipistrelle (*Pipistrellus pipistrellus*). This does not affect the overall valuation of the bat assemblage south of the River Thames, which is assessed as being of county-level importance (i.e. the geographic scale at which the loss of the bat assemblage would be felt would be a county level).
Paragraphs 8.9 – 8.16 Pages 65/66	**Terrestrial Biodiversity (Trees)** The Veteran trees the proposals state that "a minimum of 30 individual specimen trees would be planted as replacement for lost veteran trees". KCC also has concerns that ratio of 1 to 30 trees is not sufficient for the loss of veteran trees and also there must be a responsibility to retain standing deadwood. For example, all dead wood must not be left in log piles and should instead be strapped to felled mature trees to support invertebrate diversity. One of the first actions of the Cobham Ashenbank Management Scheme (CAMS - that came out of Channel Tunnel Rail Link) was to place both vertical and horizontal dead wood from clearance works in Ashenbank Wood. Planting is suggested as compensation since it is not possible to mitigate such a loss (but see below on pond habitat). The SSSI however needs to be considered in its overall context. The western edge of the Kent Downs AONB also marks the switch from woodland to agriculture in various forms (and then urban development). Jeskyns, formerly farmland, is new planting from 2009 so when fully mature will provide additional woodland habitat to the south. This is related to the underlying geology as the chalk comes to the surface. Ashenbank Wood is split between the southern part which is ancient woodland and northern part which was woodland pasture, which is to be found also on the southern side of Cobham Park. Cobham Park itself is a more open Repton landscape around the Hall, but still with substantial number of trees. To the southeast is Cobham Woods, owned by the National Trust, and the nature conservation continues via Ranscombe Farm (managed by Plantlife) towards the Medway at Cuxton. North of the A2 and further east are Great Crabbles Wood and Court Wood towards Higham as well as Shorne Woods and Randall Wood, which form part Shorne Woods Country Park. As the heritage analysis shows *(Appendix 6 to the LIR)* the project is mainly going to be built on land that was part of the former Cobham Estate of the Earls of Darnley. There is therefore a historical integrity to the whole area on how the land was managed and used10. The A2 has its extended central reservation of about 5.3 ha (Thong Lane to Park Pale bridges) which currently provides an ecological stepping stone between either side of the A2, and which will be totally destroyed by the project. The area between the current A2 and HS1 is a mixture of landscape planting (from CTRL (Channel Tunnel Rail Link – now HS1) construction in 2003 or earlier and therefore well established), and remnants of Ashenbank Wood. Historical

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	air photographs (1940) show the A2 running through woods. To the west of Ashenbank Wood is the avenue that forms the access Scalers Hill House and further west still orchards. When CTRL was being planned in the mid 1990's the then proposed cutting through Ashenbank Wood turned out to need a gentler slope than had been originally assumed for geological reasons, which therefore resulted in the loss of more of the wood. Hence the approach adopted was of aa wider cutting with a gentler upper slope with planting and a steeper slope down to track level. Effectively most planting between A2 and HS1 is going to be removed, increasing the severance effect. Given its age, this has met the establishment criteria for the relevant habitat type set out in Table 4.1 of the oLEMP [APP-490]. A2/M2 widening from Cobham junction east was complete at the same time at HS1 whilst the A2 widening from West Cobham to Pepper Hill was completed in 2008. The area along the east side of Gravesend is mainly in agricultural or leisure uses currently, and will become occupied by the A2/A122 junction (with planting between the slip roads) and a deep cutting containing the A122 leading down to the portal (28m deep).
Applicant's Response	For clarity, Gravesham Borough Council's reference to "a ratio of 1 to 30 trees" is incorrect. The SoCG between the Applicant and Kent County Council [**REP1-103**] provides specific information regarding veteranised hulks and retention of standing deadwood, retention of scrub material and dead hedging within items 2.1.50 and 2.1.134 (DL-1): '*It is agreed that where possible, the loss of veteran trees and ancient woodland should be avoided.* *The Applicant has worked to avoid impacts, but where they are unavoidable, has sought to design a compensatory package of planting and other measures, in discussion with the Kent Downs AONB unit, Kent County Council, the Forestry Commission and Natural England.* *Where the loss of veteran trees is unavoidable, the hulks of those trees would be translocated. Other trees will be 'veteranised' as further compensation'.* (item 2.1.50) '*The removal of trees to facilitate construction of the Project is discussed in ES Appendix 7.12: Arboricultural Impact Assessment.* *The worst-case assumption on the likely loss of trees in paragraph 5.2.11 of the Arboricultural Impact Assessment is that six potential veteran trees (trees identified during Project surveys as displaying the features of a veteran tree but not recorded on the Ancient Tree Inventory) would be removed to facilitate the Project. Three of these six potential veteran trees would be lost south of the River Thames. However, commitment LV001 of the REAC mandates an aim for the detailed design for the Project, including diverted utilities, to reduce the removal of trees and vegetation as far as reasonably practicable. This includes potential veteran trees.*

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	In accordance with commitment LV032 set out in the REAC, a minimum of 30 specimen trees would be replanted as replacement for lost veteran trees, 15 of which would be planted to the south of the River Thames in Kent. This specimen tree planting would be in addition to the extensive native woodland planting also proposed south of the River Thames, as shown on the Environmental Masterplan Sections 1 & 1A, 2, 3 4. *Where felling of veteran trees cannot be avoided, the intact hulk would be retained and relocated in close proximity to a nearby veteran tree or within a parkland to allow fungi and invertebrates to relocate and promote habitat creation (in the form of standing dead wood). This measure is secured via the REAC commitment LV031*'. (item 2.1.134)
Paragraphs 8.17 – 8.21 Pages 66/67	**Terrestrial Biodiversity (Disturbance to Protected Sites)** APP-146 ES Chapter 8 para 8.6.5 suggest that during construction the whole area between the A2 and A226 will be closed to access except for Thong Lane itself. It suggests that current users of this area will disperse over other sites, with minimal impact. An access link will remain along Thong Lane so from Riverview Park it will be possible to access Shorne Woods Country Park, albeit going through a construction site and crossing a haul road. Residents in the Marling Cross/Singlewell area have options to use Jeskyns and wider countryside accessible via the Hare's Bridges over the A2 (see section 13 for more information). It is not clear how walking and cycling access through the Marling Cross junction will be impacted by construction (which is basically most active at the beginning and end of the project). Those further north along Thong Lane and at Chalk may well be tempted to spend more time on the North Kent Marshes. Dog disturbance is a major issue on the North Kent Marshes such that it is covered by a SAMMS Tariff11 under the North Kent Strategic Access Management and Monitoring Scheme. This imposes a tariff on all residential development within 6 km of the Ramsar/SPA on the marshes, which some of this is within the area of the project12. The current fee for a new residential (C3) dwelling is £314.0513. The developers of the Lower Thames Crossing is not directly required to pay any tariff as no new residential property is proposed. An indirect effect during construction therefore may well be to increase pressure on the Ramsar/SPA as alternative to the routes towards Shorne/Thong that are not available for some 5½ years. *Ask*: The usage of NG2/NG3 and NG5/NS172 should be monitored to ensure that there are no negative impacts. If there are Birdwise North Kent will be able to advise what appropriate steps should be taken.
Applicant's Response	Recreational disturbance to the North Kent Marshes is covered in sections 6.2.38 and 6.2.49 of submission of the Habitats Regulations Assessment [**APP-487**]. In summary, the effect of the Project construction on the use of Public Rights of Way, including by dog walkers, on the Thames Estuary and Mashes SPA/Ramsar has been assessed with no material changes predicted to occur, and therefore a conclusion of no likely significant effect in the SPA/Ramsar was reached. The Applicant is not proposing to monitor because no likely significant effect is predicted due to the

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	habituation of the birds to existing recreational pressures, which will not change substantially as a result of Lower Thames Crossing construction activities.
Paragraph 8.21 **Page 67**	**Terrestrial Biodiversity (Severance)** What will in effect be a continuous construction site stretching from A226 south to the A2 and then east to Three Crutches, will create severance for a substantial period. This will be followed by the permanent severance of the completed roads themselves, which in the case of A122 is new, and in the case of the A2 will be a dramatic increase in built area
Applicant's Response	The method of assessing construction phase effects, which includes consideration of severance, by dividing habitats or wildlife corridors, is outlined in paragraphs 8.3.34 8.3.37, ES Chapter 8: Terrestrial Biodiversity [**APP-146**]). Details of the construction phase impacts is provided in Section 8.6 of Chapter 8 [**APP-146**]. The design of all green bridges proposed as part of the Project is reported in the Project Design Report Part D: General Design South of the River [**APP-509**]. All three green bridges within Kent are maintaining road connections that already exist in those locations to avoid severance impacts as a result of the Project. In respect of the green bridges at Brewers Road and Thong Lane South, these are providing new habitat connections where they are currently absent due to the existing transport corridors of the A2 and HS1. The provision of green bridges in these locations is, therefore, a benefit as a result of the Project, and is reported in ES Chapter 8: Terrestrial Biodiversity [**APP-146**] paragraph 8.5.8, and oLEMP [**REP1-173**] paragraph 5.6.6. In respect of Thong Lane North green bridge, this is the widest green bridge proposed by the Project and will connect into the wider habitat connections being provided as a result of the landscape planting and habitat enhancements proposed as part of the Project. Thong Lane North green bridge planting zones shall be maximised. Their width shall vary across the length of the bridge but shall have a 7m minimum width at pinch points to provide habitat connection across the bridge, and will also provide new WCH connections to Shorne Woods Country Park where WCH access is currently limited from the west. The specific design principles for green bridges are reported in Design Principles [**APP-516**], notably: Clause STR.08 states that planting would tie in with the broader landscape to ensure connectivity. Clause S1.04 states that detailed design would provide connectivity of habitats for a range of protected species between Shorne Woods and Ashenbank Woods, Jeskyns and Cobham Park. This connectivity is currently absent given the habitat severance caused by the existing A2 and the HS1 railway line, so the provision of new green bridges at Thong Lane South and Brewers Road would help address this existing impact. Clause S2.04 states that Thong Lane North green bridge would be designed to extend the character of the well-vegetated Thong Lane, and to connect woodland to the east and west to provide a habitat corridor for mammals.

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	This connectivity between habitats adjacent to and within the green bridges would facilitate movement of a range of species across them. Clause S3.18 states that the following minimum widths shall apply in accordance with design principles STR.08 and STR.16: • The planting green zones shall be maximised. Their width shall vary across the length of the bridge but shall have a 7m minimum width at pinch points. The WCH routes may be located within the planting zones. • WCH provision on the west side within the planting zone, comprising a 3m shared pedestrian/cycle route and a 3.5m horse riding route. • WCH provision on the east side within the planting zone, comprising a 3m shared pedestrian/cycle route and a 3.5m horse riding route. A WCH crossing shall be provided on the bridge between the east and west WCH routes.
Paragraphs 8.21-8.23 Page 67	**Terrestrial Biodiversity (Air Quality, Noise and Dust)** On the North Kent Marshes the basic concerns are impact of noise and disturbance from Chalk and Milton construction sites and the possible impact on the water table from the tunnelling operations and therefore the birds on the marshes. The Milton site creates a direct vertical connection to the tunnels. The assumption in the ES is that the implementation of best practice guidelines on air quality, dust, lighting, noise and vibration etc. will be sufficient during both the construction and the operational phases of the project. *Ask*: all aspects of air quality, dust, lighting, noise and vibration should be monitored, and appropriate menu of actions laid out to be implemented if the proposed standards are breached.
Applicant's Response	The REAC within ES Appendix 2.2: CoCP [**REP1-157**] sets out the air quality, dust and noise and vibration monitoring commitments to be undertaken by the Contractor during construction (AQ005-AQ008, NV005, NV009 and NV015). Actions to be undertaken by the Contractor in the event of air quality and noise monitoring exceedances are also set out in REAC commitments AQ008 and NV015. Construction lighting will also be controlled to avoid adverse effects on sensitive ecological receptors as per REAC commitment TB024. The impacts of noise, disturbance and possible impacts on the water table from the Chalk and Milton construction sites on the Thames Estuary and Marshes SPA/Ramsar site have been assessed within the Habitats Regulations Assessment Screening Report and Statement to Inform an Appropriate Assessment [**APP-487**]. The measures in place to avoid and reduce the impacts are set out within Sections 3.3 and 7 of the Habitats Regulations Assessment Screening Report and Statement to Inform an Appropriate Assessment [**APP-487**].

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Paragraphs 8.24-8.27 **Page 67**	**Terrestrial Biodiversity (Water Table)** The concern with the water table is that at the surface it is served by rainfall and surface runoff. As the North Kent Marshes is an international habitat for wading birds it is essential that this is maintained. This applies across the area whether it is SPA/Ramsar or Local Wildlife site (Milton Range) as it is all one hydrological system. In addition, the Thames and Medway Canal and railway sit above the marsh (with drainage passing beneath) and its integrity needs to be preserved as habitat, as well as a non-designated historic structure (along with the integrity of the North Kent Line). The obvious risk is that the tunnelling process, either the main bores or the ground protection tunnel could cause the water table to be pierced or impacted by dewatering with potentially serious consequences for natural habitat as well as drainage. Pumping is proposed from the tunnels via the marshes and Denton outfall. If the ground protection tunnel is not needed that risk of this is considerably reduced. It is noted that has been agreed with Natural England there will be temporary habitat enhancement at the marshes south of the North Kent line. The Council sees no reason why this should not be made permanent. *Ask:* Monitoring of water table, flow and quality in the drainage system and menu of actions if the standards are breached.
Applicant's Response	REAC commitment HR08 states: '*Surveillance of groundwater levels will be carried out within the Thames Estuary and Marshes Ramsar in the vicinity of the tunnelling works for the duration of the construction period at borehole locations to be agreed with SoS in consultation with Natural England and the Environment Agency. The Contractors will complete an annual review, for the period of construction and the first five years of operation, of the groundwater levels and consult on any implications for qualifying features of the Ramsar site, and any necessary remedial measures with Natural England and the Environment Agency*'. REAC commitment RDWE033 commits to water quality standards for the discharge into the western ditch, which will be finalised by the Environment Agency after pre-construction surveys to ensure that construction runoff will be no worse than the baseline water quality for the ditch and Ramsar site, and which will be released at greenfield runoff rates. It will be a requirement of the discharge permit to monitor achievement of the standards.
Paragraph 8.28 **Page 67**	**Terrestrial Biodiversity (Surveys)** Kent County Council and others have raised concerns over whether sufficient survey work has been completed on some species (moths, bats etc.). Given the two year construction delay there is no reason why this work, as agreed with the relevant authorities, should not be completed to the appropriate standard prior to construction commencing.

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Applicant's Response	The Applicant is confident the data submitted with the DCO application is appropriate for the assessment of the Project. Requirement 7 of the draft DCO [**REP1-042**] secures the need for pre-construction surveys, including the following commitment: '*7.-(1) No part of the authorised development is to begin until for that part final pre-construction survey work has been carried out to establish whether European or nationally protected species are present on any of the land affected or likely to be affected by that part of the authorised development, or in any of the trees and shrubs to be lopped or felled as part of the relevant works*'. The timing of these pre-construction surveys will be informed by the proposed start dates for impactful work to ensure that the data gathered is as up-to-date as possible to inform relevant mitigation strategies, and if required, protected species mitigation licences.
Paragraphs 8.29 – 8.30 Pages 67/68	**Terrestrial Biodiversity (Reptile Receptor Site)** KCC also note that only one receptor site has been mentioned in the Outline Landscape and Ecology Management Plan (oLEMP) (APP-490) for reptiles. The area concerned is East of Thong in respect of which the Council has a landscape and heritage objections, dealt with elsewhere. The applicant is currently seeking to advance this (as it is not otherwise directly impacted by construction other than the removal of an overhead line) by means of a separate planning application, which will need to justify itself in a non-scheme world. It is noted that the receptor site will require habitat manipulation and then habitat creation to make it suitable, taking an estimated 10 years before the habitat is of the required condition. Mitigation areas need to be in a condition to support the species when required during the construction timetable.
Applicant's Response	The Applicant has provided further information on the approach to mitigation and receptor sites for reptiles/GCNs and this is detailed within the SoCG between the Applicant and Kent County Council [**REP1-103**] at item 2.1.133 (DL-1): '*Thong Open Mosaic Habitat has been identified as a receptor site for reptiles in 6.7 outline Landscape and Ecology Management Plan (oLEMP) [**APP-490**], Section 5.9. The relevant habitat typologies for this management area are reported in Sections 8.22 (LE8.1: Open mosaic habitat) and 8.26 (LE8.5: Ecological ponds).* *For all habitat typologies within the oLEMP [**APP-490**], their time to target condition has been aligned to that set out within Natural England's biodiversity metric calculator (v3.1). This considers the habitat type and the proposed target condition and provides an establishment period to meet the criteria set out for that habitat within the metric. In the case of open mosaic habitat, this establishment period to meet the metric criteria is 10 years.*

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	For the site to offer valuable reptile habitat it needs to provide the following (Edgar et al.*, 2010):* • *Warmth (to facilitate temperature regulation)* • *Structural complexity (to offer shelter, foraging, hibernation opportunities)* • *Habitat connectivity (to provide links into the wider landscape and facilitate genetic interchange and offer resilience to challenges such as climate change)* *The Thong Open Mosaic Habitat management area is positioned immediately adjacent to Shorne Woods Country Park on its northern, eastern and southern sides. These links would be maintained throughout Project construction. The Project landscape design in Environmental Masterplan Sections 1 & 1A, 2, 3, 4 and 9 details how this area would then connect into Thong Lane green bridge north, linking this site with habitats west of the Project such as Open space north of Claylane Wood, and Chalk Park and environs as detailed in Sections 5.7 and 5.12 of the oLEMP; both management areas would provide high quality reptile habitat.* *The Thong Open Mosaic Habitat management area is currently horse-grazed pasture which would develop structural diversity within 12–18 months of removing this grazing pressure. Its structure would be further enhanced by the creation of areas of sparsely-vegetated nutrient-poor substrate, refuge habitats and hibernacula which would offer opportunity for thermoregulation, shelter and hibernation. Ecological ponds would provide additional habitat structural diversity.* *The Thong Open Mosaic Habitat management area is therefore considered an appropriate site for reptile translocation within 12–18 months of habitat creation, but that, to align with the biodiversity metric criteria for open mosaic habitat, the metric calculator presents a 10 year establishment period.* *Recent discussions between Kent County Council and LTC have covered the additional provision of potential reptile translocation sites. Two offsite receptor areas are proposed for reptiles, both situated north of the River Thames in Essex. In Kent, habitat creation within areas identified for nitrogen deposition compensation would provide additional suitable habitat for reptile translocation. The woodland and grassland habitat proposals for these areas would offer suitable reptile habitat in the grassland and woodland edge areas. With habitat creation being split on a roughly 70% woodland and 30% grassland basis, there would be approximately 13ha of suitable receptor area for reptiles. These areas would be used to release reptiles in preference over the offsite receptors north of the River Thames, which would only be used as a last resort*'.
Paragraphs 8.30 – 8.32 Pages /68	• LE8.1 Open mosaic habitat (oLEMP para 8.22) – includes importing pulverised flue ash which is very alkaline and the creation of a 'brownfield or previously developed/disturbed land' (para 8.22.4) • LE8.5 Ecological ponds – which are not a normal feature of this sub area as but are a result of the loss of habitat in Shorne Woods along its southern edge

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	There are ponds within the Shorne, Ashenbank and wider woodlands, many of which appear to have been created by clay extraction or man made for landscape reasons (e.g. Repton ponds in Cobham Park). In the agricultural area surface water is rare, so ponds are not a natural feature, a product of the underlying chalk. In normal conditions there is no flowing water, though a stream does run north from Shorne Woods in exceptionally wet conditions to infiltrate in the fields, with some localised flooding occurring along Shorne Ifield Road. There is therefore a concern at introducing an unnatural feature into this part of the landscape and the import of a contaminant material, pulverised flue ash. There are substantial quantities of the latter, and the alkaline habitat it creates, out on Swanscombe Peninsula, in the newly designated SSSI as well as on the north side of the River Thames.
Applicant's Response	The inclusion of pulverised fuel ash, together with sands and gravels, as an inert substrate within areas of open mosaic habitat is an approach that has been discussed in detail with Natural England around the value it can offer when working to establish a diverse, sparce sward to support wide assemblages of terrestrial invertebrates and good quality reptile habitat. However, the concerns of Gravesham Borough Council around its use at this particular site are noted, and will be taken into account at detailed design as required by the oLEMP [**REP1-173**]. The provision of ponds in this area would enhance the quality of the habitat for reptiles and are a requirement of the great crested newt mitigation strategy detailed in ES Appendix 8.17: Draft EPS Mitigation Licence Application – Great Crested Newts [**APP-409** to **APP-413**]. Ponds are provided to comply with the protected species licence relating to great crested newts. The proposed location has been selected is in low lying area to maximise reuse of natural rainwater runoff. The design and construction of the mitigation ponds will follow the best practice guidance, Creating Ponds for Amphibians and Reptiles (Freshwater Habitat Trust). It is considered that these would complement the existing pond which supports great crested newts located immediately adjacent to this site in its south-eastern corner.
Paragraphs 8.33 – 8.34 Page 68	**Terrestrial Biodiversity (Land Bridges)** Land bridges proposed to be provided at Thong Lane North (86m width), Thong Lane south (41m) and Brewers Road (32m). These are expected to (see App-NNN Design Principles STR.08 and S1.04 and other references) perform a variety of functions including carrying highway, cycle/walking routes, landscaping and biodiversity connectivity. The Borough Council has consistently pressed for these bridges to made wider so as to enable them to perform a variety of functions more effectively, which over the consultation process they have done so. Brewers Road is constrained HS1 structures on the south side and the SSSI on the north side and the need to fit in a utilities corridor that cannot have trees and shrubs planted on it. The biodiversity concern along the A2 is that the bridges do not adequately connect to habitats on the southside due to the combined effects of the enlarged A2, Darnley Lodge Lane (realigned and extended) and HS1. There is a tension between the various functions for these green bridges as outlined above. The Council has suggested that rebuilding the Park Pale bridge as a green bridge, although

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	not required physically by the project would be one way of addressing this matter, as it connects better to habitats and would assist in landscape terms.
Applicant's Response	The Applicant has set out its position regarding the width, form and functionality of Green Bridges within the SoCG with Gravesham Borough Council [**REP1-100**] at items 2.1.21 and 2.1.22: '*The Applicant agreed with Gravesham Borough Council's suggestion and Thong Lane green bridge over the A2 was widened by 10m to 40m. The total green width will therefore be 20m wide (double the previous proposal).* *However, it is not agreed that Brewers Road bridge should be further enlarged. A larger bridge over the A2 would cause construction disruption to local and Strategic Road Network (SRN) users for a longer period of time.* *The Applicant considers that the width of the proposed Green Bridges provides appropriate landscape mitigation and biodiversity linkage.* *The Applicant notes that the physical constraints of Thong Lane Bridge over the A2 differ to those of the Thong Lane bridge over the A122 and while recognising the reference to the Guidance Note, the Applicant considers the approach to be appropriate.* *Brewers Road Green Bridge has not been widened because of the existing constraint of the bridge across HS1.* *The Applicant does not consider that there is justification under the remit of the 2008 Planning Act to deliver a Green Bridge at Park Pale.* *The location of the planting on and around the bridges has been selected for landscaping reasons, to use the planting to make them into gateway features for those travelling towards them on the A2*'. (item 2.1.21) The Applicant notes in addition to the above position that the location of the planting on and around the bridges is also intended to provide safe passage for wildlife. *'The Applicant has considered and incorporated elements suggested by Gravesham Borough Council where practicable, alongside advice from the Kent Downs AONB Unit, Kent County Council and Natural England. The Applicant continues to engage with all parties to seek a balanced approach through detailed design.* *The DCO application via the Design Principle STR.08 makes clear that the Green Bridges are multi-functional in terms of mitigation.* *The Applicant will replant vegetation where possible to either side of the A2. There is no space for a planted central reserve - it was considered preferable to limit widening and associated impacts on the Area of Outstanding National Beauty (AONB) and country parks. The green bridges would provide better flight lines for species to cross the A2, and would strengthen links between either side.*

LIR Reference	Local Impact Report Extract / Applicant's Response
	The Applicant notes that Local Authorities would need to be consulted on any modifications to the scheme within the parameters of the Environmental Masterplan and oLEMP and therefore this provides the appropriate balance of certainty and flexibility'. (item 2.1.22) The Applicant notes that paragraph 2.1.11 of the oLEMP [**REP1-173**] confirms that the corridor does not prevent the planting of trees and shrubs: '*All landscaping/planting and ecological mitigation proposed in relation to the Project, as set out in within this Outline LEMP, will adhere to the standard safety distances as set out in the Electricity Safety, Quality and Continuity Regulations (ESQCR) and accord with any planting policies and easement restrictive covenants associated with the utility networks*'.
Paragraph 8.35 **Pages 68/69**	**Terrestrial Biodiversity (Biodiversity Net Gain)** Biodiversity Net Gain (BNG) calculations for the Project show that it is anticipated to be lower than 3% in Kent compared with 9% north of the River (APP-417 ES Appendix 8.21 Biodiversity Metric Calculations). Overall the net gain is 7% whereas section 99 and schedule 15 of the Environment Act 2021 when they come into force, may make biodiversity net gain (BNG) a requirement for Nationally Significant Infrastructure Projects (NSIPs), with a minimum of a 10% BNG required. Furthermore, there are concerns that condition assessment information may be inaccurate – a limitation the project ecologists acknowledge.
Applicant's Response	In the context of this question, it should be noted that the Project is applying the Natural England Biodiversity Metric several years ahead of this being a mandatory requirement. For Nationally Significant Infrastructure Projects, mandatory BNG requirements are likely to commence in November 2025, and (subject to further announcements from government) is expected to apply to applications accepted for examination after that date, which would not engage the A122 Lower Thames Crossing. However, the design has been developed to avoid or minimise significant effects on the environment, and is based on the principle of maximising biodiversity outcomes by creating the highest distinctiveness habitats appropriate to the Project. The Project has not claimed that it would achieve biodiversity net gain. In its design, the Project has focused on maximising biodiversity value through being ambitious in terms of the habitats proposed for essential mitigation requirements, shown in ES Figure 2.4: Environmental Masterplan [**APP-159** to **APP-168**], and their long-term management described in the oLEMP [**REP1-173**], with a focus on the Lawton principles of more, bigger, better and joined up. It is recognised that the ambition demonstrated in the design does not necessarily maximise the value calculated by the Biodiversity Metric, but it is the view of the Applicant that the Project delivers a design of high biodiversity value. It is expected that the forecast Metric performance would improve during detailed design. Design refinements would seek to further reduce habitat loss during construction; minimise lags between habitat loss and creation; and maximise the condition and distinctiveness of habitats created. The Project would also seek to maximise biodiversity performance over the full project lifecycle.

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	With regard to the accuracy of information, the Applicant acknowledges limitations within the assessment and these are detailed in ES Appendix 8.21: Biodiversity Metric Calculations [**APP-417**]. However, it does not accept that there are inaccuracies within the assessment. As has been confirmed to Kent County Council, field surveys to inform the Project were undertaken between 2017-2020, and therefore started before the first Biodiversity Metric Condition Assessment criteria were released in July 2019. There were two further updates to the Metric and associated condition criteria, prior to the application for development consent: Metric 3.0 (July 2021); and Metric 3.1 (April 2022). Given the scale of the Project (the area representing the Project's baseline is approximately 2,400ha) and the number of different landowners involved, it has not been possible or is not considered proportionate to re-survey the entire site to meet the changing Metric condition criteria requirements. This limitation has been acknowledged in ES Appendix 8.2: Biodiversity Metric Calculations [**APP-417**]. However, as stated in the assessment, a detailed exercise has been undertaken to review the desk and field survey data available, including consideration of Priority Habitat information to assign appropriate condition using the Metric 3.1 condition criteria. Where assumptions have been made, these have been based on the information available and have been precautionary to avoid potentially under-valuing the baseline. Likewise, other elements of the assessment have been precautionary so that it is considered a realistic worst-case scenario at the preliminary design stage. It is expected that the forecast Metric performance would improve during detailed design as design refinements would seek to further reduce habitat loss during construction, minimise lags between habitat loss and creation and maximise the condition and distinctiveness of habitats created.
Paragraph 8.36 **Page 69**	**Terrestrial Biodiversity (Light Spill)** Very minimal information has been provided for the anticipated light spill (APP-199) from the operational phase of the Project, with only a small section highlighting the expected light spill upon key receptors. Without this information interested parties are unable to determine the full extent of the impacts.
Applicant's Response	The Applicant notes that this matter relates verbatim to an issue raised by Kent County Council. The Applicant's position regarding this matter is detailed within the SoCG with Kent County Council [**REP1-103**] at item 2.1.129 (DL-1): '*The Applicant notes that the location of operational lighting is shown on the General Arrangement Plans (Volume B) and (Volume C).* *As described in ES Chapter 2: Project Description, proposed lighting has been designed with consideration of associated environmental impacts including the use of luminaires that emit no light above the horizontal to reduce skyglow, directing lighting to reduce light spill, and the use of warm white LEDs to reduce the impact of light spill. ES Appendix 8.15: Construction and Operational Light Spill Calculations provides details on changes in light levels during the operational phase.*

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	These measures are reinforced in principle LST.02 and principle LST.03 of the Design Principles to preserve the nocturnal character of the landscape'. The effect of light spill on European sites is assessed in paragraphs 6.2.107 to 6.2.115 of the Habitats Regulations Assessment - Screening Report and Statement to Inform an Appropriate Assessment [**APP-487**]. The effects of light spill on all other terrestrial biodiversity receptors is reported in ES Chapter 8: Terrestrial Biodiversity [**APP-146**]. The calculations that support the assessment of the effects of light spill on ecological receptors are reported in ES Appendix 8.1: Construction and Operational Light Spill Calculations [**APP-407**].
Paragraph 8.37 **Page 69**	**Terrestrial Biodiversity (Nitrogen Deposition Sites)** The nitrogen deposition compensation sites are a late addition to the project and have therefore not been fully integrated into the overall strategy or assessed for their current ecological, landscape or heritage value. The oLEMP (APP-490) leaves open what the detailed proposals for these sites will be. A process is being proposed for how this will be arrived at but needs to include the views of the local community as well as the technical aspects.
Applicant's Response	All nitrogen deposition compensation sites have been included and assessed within the application for development consent, including ES Chapter 6: Cultural Heritage [**AS-044**] ES Chapter 7: Landscape and Visual [**APP-145**] and ES Chapter 8: Terrestrial Biodiversity [**APP-146**]. As highlighted, the oLEMP [**REP1-173**] includes detail on how the design of ecological sites will be developed post consent. The Contractor would produce a detailed design and LEMP which would be submitted to the Secretary of State for approval under Schedule 2 Requirement 5 of the draft DCO [**REP1-042**]. In line with the oLEMP [**REP1-173**] Section 4, the LEMP would involve an Advisory Group to ensure the aims and objectives of each of the areas are met.
Paragraphs 8.38 – 8.40 **Page 69**	**Terrestrial Biodiversity (Comprehensive Integrated Mitigation Plan)** Whilst appreciating that the ES needs to describe the areas of provided for mitigation or compensation and explain their relationship to what is being lost or disturbed what has not been done is to consider all the compensation sites list in para 2.20 above in the round and look at how these can all work together not just in ecological terms but also taking into account the landscape, heritage and access issues to produce an integrated plan. Ideally this needs to be set into a wider context taking into account the aims and objectives of the landowners and other relevant agencies across the wider area so that as far as possible these all work together. The Design Principles (APP-516) provide some overall guidance on this but are not detailed enough to provide the necessary certainty or joined up approach. The current information that is provided in relation to the landscape and ecological mitigation measures proposed, significant detail and clarity appears to be deferred to the post consent stage. Such a deferral of important detail increases the uncertainty of the assessment of residual impacts within the application documents and places a significant burden on stakeholders post consent.

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	Ask: Commitment to a comprehensive plan for the habitats, landscape and heritage across the major compensation and mitigation sites identified in the oLEMP that takes a more nuanced approached than is apparent in that document, whilst meeting the targets that have been identified. This needs to be progressed now so a plan can be signed off by the Borough Council and other relevant bodies and then be implemented when the project commences.
Applicant's Response	The Applicant considers that a "comprehensive plan of what's proposed" has been submitted already in the form of the Environmental Masterplan [**APP-159** to **APP-168**], the Design Principles [**APP-516**] and the oLEMP [**REP1-173**] (and associated REAC commitments [**REP1-157**]). These set the framework for the detailed design which will be developed in consultation with stakeholders and approved by the Secretary of State as part of the second iteration of the EMP. The Applicant is developing a process for the development of the detailed design (including the consultation process within it) to ensure that the measures proposed and secured in the DCO will deliver the required objectives. The Applicant has engaged with, and will continue to engage with, relevant stakeholders in developing that process. The detailed design process will involve a consistent and accessible process and documentation for all environmental designs. The detailed design process will be phased to develop a framework of consistent principles for design across the Project; to consider options and make decisions on outcomes and success criteria for each key site; and to develop detailed prescription to achieve the objectives.
Paragraphs 8.41 – 8.42 Pages 69/70	**Terrestrial Biodiversity (Project Funding)** As a result of the CTRL (HS1), what became known as the Cobham Ashenbank Management Scheme (CAMS) came into being, which began with an initial £750k (1996 prices) contribution from Union Railways and eventually produced a contribution of the order of £7.5m worth of projects. They included the restoration of many of the Repton landscape features in Cobham Park and the restoration of the Darnley Mausoleum. Work, funded by National Highways Designated Funds but related to the Lower Thames Crossing proposal, has been taking place on the concept of a Super National Nature Reserve with Natural England and other relevant landowners and other interested parties. Ask: A commitment to supporting a wider environmental project covering ecology, landscape and heritage and other related matters such as access and car parking. This needs to come from the project as Designated Funds do not exist after 31 March 2025 and is in compensation.
Applicant's Response	This comment is noted. The Applicant continues to engage with Gravesham Borough Council on this matter. The Applicant notes that there is a committed Community Fund (S106 Heads of Terms [**APP-505**]) that could be accessed by qualifying community groups to deliver small-scale projects related to this ask.

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Paragraphs 9.3 – 9.6 **Page 71**	**Marine Biodiversity** Given that there is no proposed use of the River Thames from Gravesham the main issues would appear to be: • Any impacts that may arise from the discharge of water via the Denton outfall into the river • Possible implications from a tunnel collapse or similar catastrophic event The latter point would be an extreme event and would need to be dealt with in the context of a plan that the contractor will need to develop to deal with such an event. The water outflow issue relates to its quality, which would also impact on the water resources, and therefore terrestrial ecology, of the marches. Asks: Monitoring regime for the water quality both in the marshes and the Thames and a list of potential actions in the event of any issues arising.
Applicant's Response	Potential impacts from the Project on South Thames Estuary and Marshes SSSI, and Thames Estuary and Marshes Ramsar site, particularly those resulting from changes in water quality, are reported within paragraphs 8.6.19 – 8.6.23 in ES Chapter 8: Terrestrial Biodiversity [**APP-146**]; and within paragraphs 14.6.34 and14.6.42 in ES Chapter 14: Road Drainage and the Water Environment [**APP-152**]. Essential mitigation measures to control both the quantity and quality of construction runoff are secured by the REAC commitment RDWE033, under which the quality of the discharge would be governed by the conditions of an EA discharge consent that would set discharge parameters to ensure that standards not environmentally worse than those recorded during the pre-construction survey in the receiving watercourse are met. It is expected that as a condition of this consent, monitoring of the receiving watercourse at the outfall would be required to demonstrate the efficacy of the treatment system. As a consequence of the proposed REAC commitment, no significant adverse effects are reported for the SSSI, Ramsar site or River Thames.
Paragraphs 10.2 – 10.8 **Pages 72/73**	**Geology and Soils (Agricultural Land)** As explained in Chapter 10 of the ES (APP-148), agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use, whilst Grade 5 is very poor-quality land with severe limitations. Grades 1, 2 and 3a are defined as Best and Most Versatile (BMV) land. A summary of the findings of the Applicant's (RR-0264) detailed survey is presented in Section 10.4 of APP-148, while the Agricultural Land Classification Factual Report (APP-425) provides the findings of the detailed survey. Page 2 of the Agricultural Land Classification Mapping (APP-302) shows that the land affected in Gravesham is predominantly grade 2 with some grade 1 land near the A2 junction, pockets of grade 3a and mainly grade 3b around the southern portal and Milton compound area.

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	Whilst the Council was advised that the Project design has been optimised to minimise the land take required, in particular where this is higher quality agricultural land, the ES does recognise that a significant amount of BMV land would be taken by the Project as shown by table 10.8 (APP-148). Over 50% (55.2%) of the land within the Order Limits south of the Thames, is considered to be BMV agricultural land. The National Networks National Policy Statement 2014 advises that where significant development of agricultural land is demonstrated to be necessary, applicants should seek to use areas of poorer quality land in preference to that of a higher quality. It is not clear how this has informed National Highways design for the project from our consideration of APP-516 Design Principles or APP-508 National Design Rationale. In particular in respect to the permanent and temporary land take and the decisions made about where agricultural land will be re-instated. The loss of this amount of BMV land would be significant and weighs against the proposals as National and Local Planning policies seek to protect this finite resource especially as it is not being mitigated or offset elsewhere. The loss of high-quality agricultural land, to development or other uses is a clear concern to the public. As the Dicken Country Protection Society have highlighted in their Relevant Representation, this concern is multi-faceted as they are querying using high grade agricultural land for tree planting when they consider it is in the national interest to use it to grow food. They have also raised concerns about the impact on the viability of agricultural holdings (section on population and health in this LIR) and damage existing open landscape (section on landscape in this LIR).
Applicant's Response	During route selection process, impacts to agricultural land and agricultural business were considered as set out in ES Chapter 3: Assessment of Reasonable Alternatives [**APP-141**]. ES Chapter 13: Population and Human Health [**APP-151**] assessed impact on agricultural holdings (Table 13.61 at page 175). See responses to paragraphs 5.168 (pages 175/176) and 5.176 (page 180) of the NPSNN in Planning Statement Appendix A: NPSNN Accordance Table [**APP-496**], and also paragraphs 6.5.278 to 6.5.288 of the Planning Statement [**APP-495**]. The permanent land take of the Project is measured at 984.26ha (paragraph 10.6.22 of ES Chapter 10: Geology and Soils [**APP-148**]). This has been acknowledged as a very large adverse effect which is significant. A Soil Management Plan is registered in the REAC, within ES Appendix 2.2: CoCP [**REP1-157**], to protect soil resources for reinstatement and reuse. ES Chapter 13: Population and Human Health [**APP-151**] assessed the impacts on agricultural holdings (Table 13.61 at page 175).
Paragraph 10.11 -10.12 Page 74	**Geology and Soils (Unexploded Ordnance)** Unexploded ordnance is a concern for local residents, schools and businesses. Early in 1990, information came to light which showed that a network of pipe bombs had been buried at the Gravesend airfield during the war and evidence

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	indicated that the original clearance was incomplete. This resulted in many of the residents of Riverview Park being evacuated whilst the Royal Engineers carried out 'Operation Crabstick' to look for and remove any remaining underground explosives. More pipe mines were discovered during works in 2006, possibly because, as set out in the report, pipe mines on airfields could be laid at depths up to 5.0m below ground level beyond the typical detection capabilities of geophysical instruments of the time, and also potentially below post-WWII housing foundations. The Borough Council's concerns are threefold: • impact on residents etc. of fear of UXO, even if none found, • if UXO is found, that National Highways have plans in place to ensure that disruption is minimal with clear evacuation plans and temporary accommodation plans, and • finally, the implications for the Council if UXO are found and National Highways (or their contractors) plans are insufficient and its role in providing rest centres (especially as Cascades would not be available due to its proximity to the incident).
Applicant's Response	The Applicant is aware of the unexploded ordnance potential in this area as noted by Gravesham Borough Council in its Local Impact Report. Section 6.11 of ES Appendix 2.2: CoCP [**REP1-157**] states that a pre-construction risk assessment and an emergency response procedure will be prepared and implemented. Section 6.9 states that the emergency preparedness procedures will include the procedures in the event of the discovery of unexploded ordnance.
Paragraphs 11.6 – 11.12 **Page 77/78**	**Material Assets and Waste** The Council notes that these figures are different from that shown in the draft oMHP published for the Community Impacts Consultation. It must question why the volume of hazardous material for offsite management (m3) which was previously ~24,000 m3, is now only ~3,500 m3? This suggests that 85% of the material previously identified as hazardous from Section A + B (South) is remaining on site or has now been found to be non-hazardous. Known sources of potentially hazardous material include Cobham North (site has been subject to considerable remedial work) and Cobham South Services, any buildings that may contain asbestos or other hazardous materials, possible contamination from Gravesend Airfield and potentially some on the fill on Southern Valley Golf Course site. Some of the material to make bunkers, greens etc is believed to have come from the Greenwich Peninsula when the course was built, and it is unclear from the Council's records (the matter was handled primarily by the Environment Agency) what this actually was. This is in a context where some of the material form the Greenwich Peninsula was known to be highly toxic.

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	Whilst no material is shown as being moved from North of the River to South of the River, we note that section, as recorded in section 2, the oLEMP (APP-490) suggests importing PFA to the site east of Thong. That is both a potential movement from north of the river and the import of contaminated material. As explained in section 2, the construction of the Project route north of the A2 and south of Thong Lane (near the A2 compound) involves a series of deep cuttings and construction of embankments. This earthwork operation requires approximately 2 million m3 of excavated material to be handled and placed to form the deep cuttings, embankments and proposed Project landscape contours. The earthwork assessment has identified there is a deficit of 600,000m3 of excavated material, which will be sourced from the South Portal site (Southern tunnel entrance compound), just north of Thong Lane, whilst the remaining 1.4 million m3 will be sourced from the cutting operations between Thong Lane and the A2. This is a significant increase in lorry movements. Also, as explained in paragraph 7.4.9 of the oMHP, this material would be transported along the internal haul route but would need to cross Thong Lane. The road crossing would be managed under temporary traffic signals or a similar system to manage the traffic flows along Thong Lane. With the increase in lorry movements, this will increase the longevity and / or intensity of the disruption for local residents and users of the new footpath link between Riverview Park and Thong. The oMHP also refers to provisions that have been made within the Order Limits either side of the proposed project route and associated compounds (A2 compound and Southern tunnel entrance compound) for the stockpiling of material. The Applicants general approach to stockpiling is that it is necessary to include provision for stockpiling of excavated materials during construction works to aid the phasing of construction and the reuse of material across the project. They also explain that, where reasonably practicable, the stockpile locations within the compounds will be positioned to provide mitigation, such as sound or visual barriers, in line with the ES. Depending on their size stockpiles can be a visual intrusion, create noise (from the HGV movements), light pollution (if lit) and dust. The latter is a particular problem with chalk which is dry and dusty in summer (and wet and unworkable in winter).
Applicant's Response	The outline Materials Handling Plan (oMHP) (ES Appendix 2.2 Annex B) [**APP-338**] states the "Volume of hazardous material for offsite management" that has been assumed in the environmental impact assessments, presented in the Environmental Statement. The volumes differ from those previously presented for the Community Impact Consultation, as they now reflect latest design information including roads and earthworks layout, ground investigation data and topographical data. The Applicant is satisfied that the quantities reflect a reasonable worst-case scenario as is appropriate to inform the Environmental Statement. At detailed design stage, the Contractors will carry out their own assessments (including undertaking supplementary surveys if deemed necessary) and will manage the materials

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	encountered, as required in accordance with their Materials Handling Plans and Construction Site Waste Management Plans. The inclusion of pulverised fuel ash, together with sands and gravels, as an inert substrate within areas of open mosaic habitat is an approach that has been discussed in detail with Natural England around the value it can offer when working to establish a diverse, sparce sward to support wide assemblages of terrestrial invertebrates and good quality reptile habitat. However, the concerns of Gravesham Borough Council around its use at this particular site are noted and will be taken into account at detailed design. The Applicant aims to reduce road network usage by promoting the use of haul roads where reasonably practicable as part of its strategy to minimise environmental impacts. The haul road provides connectivity between the two compounds either side of Thong Lane, which avoids the use of the road network but requires crossing over Thong Lane. To aid in minimising traffic impacts along Thong Lane, as detailed in paragraph 4.5.8 and 4.5.9 of the oTMPfC [**REP1-175**], where traffic signals or similar would be required to facilitate construction movements, such as access to compounds and construction vehicle crossing points, they would be locally controlled to ensure that the local road network has priority in terms of traffic movements. Additionally, when not required operationally, the traffic signals would be turned off. Additionally, traffic-signal-controlled pedestrian crossing points or similar would be considered during production of the TMP. This would be subject to discussion and input from the relevant local highway authority at the Traffic Management Forum and included as determined by the Traffic Manager (i.e. based on road usage, safety considerations, pedestrian usage etc.). Section 7.3 of the ES Appendix 2.2 Annex B: Outline Materials Handling Plan (oMHP) [**APP-338**] outlines the stockpile management requirements to be adopted by the Contractor. Stockpile management will be carried out in a manner that addresses on site-specific activities, promotes construction phasing, and complies with environmental regulations and guidelines. Within the REAC, in ES Appendix 2.2: CoCP [**REP1-157**], the following commitments have been secured to manage or mitigate the environmental impacts from stockpiles: AQ003, AQ005, GS013, GS029, MW010, and MW016. These commitments promote good practice controls in the management of stockpiles, including segregation of waste types, and the implementation of appropriate mitigation measures to minimise the environmental impacts associated with stockpiles, including the dry and dusty nature of excavated chalk material during the summer.
Paragraphs 12.9 – 12.11 **Page 80**	**Noise and Vibration** Paragraph 12.6.9 (APP-150) indicates that a 10 dB reduction due to the application of BPM was factored into the noise predictions. Latterly, in Table 12.31 the commentary infers a further 10 dB reduction due to the specific noise control measures being proposed for respective receptor locations. It is not clear whether this is a case of double counting. Notwithstanding this, the detailed noise predictions, including site-specific control measures, to inform the Control of

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	Pollution Act, Section 61 Applications (REAC Ref. NV002) should clarify the situation for all receptors prior to each relevant phase of works commencing. Construction noise levels were predicted at 37no. receptor locations in the Gravesham Borough area, of which Table 12.31 (APP-150) identifies 13no. receptor locations that are predicted to experience a significant adverse effect during the construction phase. It is important to note that some receptor locations represent several, or more, noise sensitive receptors (notably dwellings) within a given area. For example, CN19 represents the noise exposure experienced by dwellings on Thong Lane, Genesta Glade and Vigilant Way in Riverview Park (potentially up to 18no. dwellings). No significant construction traffic noise impacts are predicted in the Gravesham Borough area.
Applicant's Response	Paragraph 12.6.9 of ES Chapter 12: Noise and Vibration [**APP 150**] sets out the framework of how Best Practicable Means (BPM) measures would be considered within the Assessment. Table 12.31 provides more detail on the proposed BPM, including the expected reduction in noise. There is not a case of double counting in the assessment. It is concluded that the 13no. receptor locations in the Gravesham Borough area only report significant adverse effects during construction in the unmitigated scenario, with the implementation of BPM all receptors within the Gravesham area are concluded to not experience significant adverse effects. Within ES Appendix 2.2: CoCP [**REP1-157**], commitments NV001, NV002 and NV004 were specifically included to ensure noise and vibration from construction activities was fully considered and assessed, with mitigation provision set out prior to undertaking any works, once exact specifics of the working practices and programme were fully understood. This would involve consultation with the relevant local authorities. REAC commitment NV009 sets out a requirement for monitoring of noise and vibration during construction to ensure measures set out in Control of Pollution Act Section 61 applications are working effectively and allow, in association with community engagement (NV008), for additional measures to be taken where identified as necessary. In response to construction traffic noise impacts, see response to paragraph 4.9, page 48.
Paragraphs 12.12 – 12.14 **Page 80**	**Noise and Vibration (Construction)** Construction vibration levels were predicted at 8no. receptor locations in the Gravesham Borough area, of which Table 12.40 identifies that 1no. receptor location (Kartar House, Watling Street) would potentially experience vibration levels above the threshold (1 mm/s PPV) if a percussive piling technique is adopted for installation of retaining wall RWN0000102 (Plate 3.1 in APP-444). However, the duration of exposure would not be sufficient to cause a significant adverse effect. The assessment concludes that operation of the Tunnel Boring Machine (TBM) and Micro-TBM will not result in significant ground-borne noise or vibration effects at any sensitive receptor.

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	The assessment concludes that, due to the existing river traffic, additional vessel movements associated with the Project will not result in significant adverse noise impacts.
Applicant's Response	This comment is noted.
Paragraphs 12.15 – 12.19 **Page 80/81**	**Noise and Vibration (Operation)** Once built and operational, noise from vehicles using the new route, and new M2/A2 connecting links, will potentially lead to adverse noise impacts on local residents, especially further away from the A2/M2 where existing road traffic noise is much lower. Table 12.47 [**APP-150**] concludes that 574no. dwellings (day) and 436no. dwellings (night) will experience a moderate or major adverse noise change in the Opening Year, across the entire Project. Table 12.49 and Figure 12.7 indicate that a significant proportion of these are located in Riverview Park and on Thong Lane. Also, one Other Sensitive Receptor (St. Aidan's Church in Gravesend) is predicted to experience a moderate or greater adverse noise change in the Opening Year. Likewise, Table 12.48 [**APP-150**] concludes that 389no. dwellings (day) and 275no. dwellings (night) will experience a moderate or major adverse noise change in the long-term assessment year, across the entire Project. Again, Table 12.49 [**APP-150**] and Figure 12.8 [**APP-316**] indicate that a significant proportion of these are located in Riverview Park and on Thong Lane. Table 12.49 [**APP-150**] identifies that 4no. dwellings on Henhurst Road, south of the M2 would experience either a moderate or major adverse effect as an indirect impact of the Project. Based on a review of the traffic data assumptions used in the assessment, this is likely due to the predicted 60% increase in forecast HGV traffic using Henhurst Road and Jeskyn's Road. The Council consider that this localised increase in HGV traffic is not justifiable considering that Henhurst Road narrows considerably where it passes through the residential hamlet of Henhurst Hill. The new tunnels will require continuous operation of a ventilation system controlled via a new control building to the north of the proposed southern tunnel portal. This will house pump rooms and associated electrical supply infrastructure which has the potential to generate environmental noise. The ES concludes that the tunnel ventilation system noise would not exceed the existing background sound level and would therefore not be significant.
Applicant Response	This comment is noted. The Applicant notes that there is forecast to be an increase in the percentage of HGVs on Henhurst Road once the Project opens, although the percentage of HGVs would remain very low overall. The Applicant is proposing to monitor the impacts of the Project on traffic on the local and strategic road networks as set out in the WNIMMP [**APP-545**]. If the monitoring identifies issues or opportunities related to the road network as a result of traffic growth or new third-party developments, then local authorities would be able to use this as evidence to support scheme development and case making through existing funding mechanisms and processes. The monitoring locations included

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	within the WNIMMP will be subject to further consultation with the local planning authority and local highway authority following DCO decision and prior to submission to the Secretary of State for approval before the Project opens.
Paragraphs 12.23 – 12.25 **Page 81**	**Noise and Vibration (Proposed Mitigation and Compensation)** REAC Ref. NV013 refers to Figure 12.6 [**APP-314**) which identifies where new and altered roads will be surfaced with a Thin Surface Course or Low Noise Surface (LNS). These are defined as: • Option 1 - Road Surface Influence (RSIH) = -7.5 dB(A) or better • Option 2 - Road Surface Influence (RSIH) = -3.5 dB(A) or better ('Level 3') • Option 3 - Road Surface Influence (RSIH) = -2.5 dB(A) or better ('Level 2') The decibel values relate to the variation in expected surface/tyre noise relative to a standard Hot Rolled Asphalt (HRS) surface (20 mm aggregate) when newly laid. The Borough Council is concerned that the Applicant is relying on this measure to reduce unacceptable road traffic noise increases due to the Project, when there is insufficient evidence provided to demonstrate that such surfacing products can achieve the required noise reductions, especially in the medium to long-term.
Applicant's Response	The mitigation for the operational phase of the Project is set out in Section 12.5 of ES Chapter 12: Noise and Vibration [**APP-150**] and presents a balanced mitigation scheme. This is based around earthworks keeping the scheme low in the environment and maximising noise reduction through physical screening (cuttings of up to 20m deep are proposed through Gravesham); the provision of noise reduction at source through Low Noise Surfacing (LNS) products; and where a balanced consideration of the performance and the potential for other significant effects outside of noise (ES Appendix 12.10: Road Traffic Noise Mitigation and Cost Benefit Analysis [**APP-450**]) permits, acoustic fencing provision. Provision of Low Noise Surfacing is a key element and effective mitigation option, with the Project implementing the highest Highway Authorities Product Approval Scheme (HAPAS) certified surface available at the time of writing, secured within ES Appendix 2.2: CoCP [**REP1-157**] REAC commitment NV013. Provision of LNS is a key element of noise mitigation on all road schemes presented within the UK, with the Applicant also using this measure to reduce noise within Noise Important Areas identified through Noise Action Plan: Noise. Assessment and consideration of the performance of the LNS has been undertaken wholly in accordance with the guidance of the DMRB LA111.
Paragraphs 12.28 – 12.29 **Page 82**	**Noise and Vibration (Proposed Mitigation and Compensation)** Table 12.48 (APP-150) suggests that 52no. dwellings and 1no. Other Sensitive Receptor will experience a moderate or major adverse noise change in the long-term assessment year, across the entire Project. The number of affected receptors located in the Gravesham Borough area is not provided, but Figure 12.8 (APP-316) indicates that a significant

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	proportion of these are located in Riverview Park and on Thong Lane. It is therefore the Council's view that, in addition to the proposed low noise road surfaces, acoustic barriers should be reconsidered for this location (identified as barrier Options 1 and 2 in Plate 4.1 of Appendix 12.10 (APP-450)) to provide more reliable long-term road traffic noise mitigation. It is the Borough Council's view that the calculated TAG values for barrier options presented in Tables 4.1 and 4.2 of Appendix 12.10 (APP-450) are underestimated, as they assume that the road surface noise performance will not reduce over time, as it degrades.
Applicant's Response	Full consideration of the mitigation package was given within the scope of the noise assessment, with the justification for the inclusion or not of noise barriers in certain locations given in ES Appendix 12.10: Road Traffic Noise Mitigation and Cost Benefit Analysis [**APP 450**]. Barrier Option 1 as listed in Appendix 12.10 was fully considered relating to noise performance and the potential for other significant effects other than noise. The results of this are presented in Table 4.1 Barrier Option 1 appraisal of said document. Consideration was given to a 1m, 2m and 3m barrier in this location. The general conclusion with regard to noise, was that whilst the barriers did remove significant effects below a SOAEL, the Value for Money (VfM) calculations did not present a cost-effective measure; returning a VfM of less than 1 in all cases. • The barrier at 1m removed one significant effect during the daytime and reduced the significance of effect at two (major to moderate) during the night, all below a SOAEL. • The barrier at 2m removed one significant effect during the daytime and reduced the significance of effect at two (major to moderate) during the night, all below a SOAEL. • The barrier at 3m removed one significant effect during the daytime and reduced the significance of effect at two (major to moderate) during the night, all below a SOAEL. The provision of the barrier from an acoustic perspective did not remove all significant effects and did not represent VfM, and increasing the height did not provide better performance in terms of removing significant effects. In addition, implementation of the measure into the design above 1m would present the potential to introduce new significant effects relating to Landscape and Cultural Heritage as presented in Table 4.1. Hence, on balance, the decision was made to not include the measure. Barrier Option 2 as listed in Appendix 12.10 was fully considered relating to noise performance and the potential for other significant impacts outside of noise. The results of this are presented in Table 4.2 Barrier Option 2 appraisal of said document. Consideration was given to a 1m, 2m and 3m barrier in this location.

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	The general conclusion with regard to noise was that whilst the barriers did remove significant effects below a SOAEL, the value for Money (VfM) calculations did not present a cost-effective measure; returning a VfM of less than 1 in all cases. • The barrier at 1m removed 11 significant effects during the daytime and 7 during the night, all below a SOAEL. • The barrier at 2m removed 18 significant effects during the daytime and 13 during the night, all below a SOAEL. • The barrier at 3m removed 25 significant effects during the daytime and 20 during the night, all below a SOAEL. The provision of the barrier from an acoustic perspective did not remove all significant effects and did not represent VfM, but with increased height came increased performance. In addition, the implementation of the measure into the design above 1m would present the potential to introduce new significant effects relating to Landscape and Cultural Heritage, as presented in Table 4.2. Hence, on balance, the decision was made to not include the measure. The barrier, therefore, would not be an appropriate or proportionate response. From a landscape and visual perspective, a 422m long barrier extending south from Thong Lane south would result in a new visual impact; it would interrupt the relatively open landscape character of Chalk Park and conflict with the landscape design objectives in this location by drawing attention to the line of Lower Thames Crossing. The higher the barrier, the greater the visual impact. From a Cultural Heritage perspective, the introduction of a barrier would further detract from the setting of Thong Conservation Area and the non-designated historic buildings within it. While this would be unlikely to result in additional significant effects from a Cultural Heritage perspective, it would compound the harm to these assets by further changing the open character of the rural setting to the west of Thong (including the former site of Gravesend Airfield). Provision of Low Noise Surfacing is a key element and effective mitigation option, with the Project implementing the highest HAPAS certified surface available at the time of writing, secured within commitment NV013 in ES Appendix 2.2: CoCP [**REP1-157**]. Provision of LNS is a key element of noise mitigation on all road schemes presented within the UK, with the Applicant also using this measure to reduce noise within Noise Important Areas identified through Noise Action Plan: Noise. Assessment and consideration of the performance of the LNS has been undertaken wholly in accordance with the guidance of the DMRB LA111.
Paragraph 12.30 **Page 82**	**Noise and Vibration (Baseline Conditions)** Baseline noise surveys were conducted at 12 locations, comprising five attended 3-hour measurements, two 24-hr unattended surveys and five unattended 7-day surveys. The Council considers that the scope and spread of the baseline surveys is appropriate and sufficient to obtain reliably inform the existing baseline situation.
Applicant's Response	This comment is noted.

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Paragraph 12.35 Page 83	**Noise and Vibration (Construction)** The threshold criteria upon which the assessment of construction noise effects is based are reasonable and appropriate. Further assessment based on actual proposed activity information provided by the Contractor, including site-specific mitigation measures, will be undertaken prior to the works to inform respective Section 61 Consent applications to the Council.
Applicant's Response	Within ES Appendix 2.2: CoCP [**REP1-157**] commitments NV001, NV002 and NV004 were specifically included to ensure noise and vibration from construction activities was fully considered and assessed, with mitigation provision set out prior to undertaking any works, once exact specifics of the working practices and programme are fully understood. This would involve consultation with the relevant local authorities. REAC commitment NV009 sets out a requirement for monitoring of noise and vibration during construction to ensure measures set out in CoPA s61 applications are working effectively and allow, in association with community engagement (NV008), for additional measures to be taken where identified as necessary.
Paragraph 12.37 Page 83	**Noise and Vibration (Operation)** The threshold criteria upon which the assessment of construction vibration effects is based are reasonable and appropriate.
Applicant's Response	This comment is noted.
Paragraph 12.38 Page 83	**Noise and Vibration (Operation)** The assessment scopes out consideration of noise from 132kV electricity overhead lines (OHL) due to typically low electrical stresses along the conductors. This is a reasonable assumption.
Applicant's Response	This comment is noted.
Paragraph 12.39 Page 83	**Noise and Vibration (Operation)** Intra-project cumulative noise associated with the new road, new/diverted OHLs and tunnel ventilation plant has not been assessed. This is because road traffic noise from the new road is expected to be dominant at all assessment locations where all three elements might contribute. This is a reasonable assumption.
Applicant's Response	This comment is noted.
Paragraph 12.43 Page 83	**Noise and Vibration (Asks)** Noise and vibration monitoring will be required during the construction phase and should be agreed with the Council prior to works commencing, via an approved Section 61 consent. As a minimum, it is expected that continuous vibration

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	monitoring will be conducted at Kartar House, Watling Street (CV2) during piling of retaining wall RWN0000102 (Plate 3.1 in APP-444). Vibration should also be undertaken at representative locations where properties are within 65m or proposed percussive piling or 45m of vibratory piling.
Applicant's Response	Commitments made within the ES Appendix 2.2: CoCP [**REP1-157**] under REAC item NV009 (Noise and Vibration Monitoring) requires monitoring to be undertaken, with NV001, NV002 and NV004 securing the need for further noise assessment once exact specifics of the working practices and programme are fully understood in consultation with the relevant local authorities. With regard to the monitoring of vibration at "Kartar House, Watling Street (CV2) during piling of retaining wall RWN0000102", REAC commitment NV017 (Vibration from Piling) specifically covers the issue of vibration from piling and the mechanisms in place to control this. These requirements would be consulted on, and where appropriate included within the scope of any CoPA s61 applications made under NV004 to Gravesham Borough Council. The need for continuous monitoring will be considered during the drafting of the Section 61 applications.
Paragraph 12.44 **Pages 83/84**	**Noise and Vibration (Asks)** Where the ES (Tables 12.32 in [**APP-150**]) identifies a potential exceedance of the respective construction noise threshold, it is expected that a Section 61 application will be made detailing more accurate noise predictions for the activities proposed and the measures proposed to minimise noise impacts in accordance with Best Practicable Means (REAC Ref. NV002 in [**APP-336**]). Appropriate noise monitoring will be agreed with the Council prior to works commencing, and [sic]
Applicant's Response	This comment is noted. The Applicant would direct the Council to Table 12.31 of ES Chapter 12: Noise and Vibration [**APP-450**], which sets out the potential for impacts from construction noise south of the River Thames and the mitigation proposed. REAC commitments NV002, NV004 and NV006 within ES Appendix 2.2: CoCP [**REP1-157**] specifies the Contractor will secure Section 61 consent under the Control of Pollution Act 1974 at relevant stages of the project as necessary. Details of any mitigation measures would be specified within this process and advised to the Council through the Section 61 process, to ensure construction noise is controlled once the specifics of the works are better understood relating to the level of noise required to be mitigated to meet appropriate thresholds.
Paragraph 12.45 **Page 84**	**Noise and Vibration (Asks)** Whilst the noise reduction performance of certified low noise surface products might be achieved when newly laid, evidence indicates that these surfaces tend to be have less durability and greater deterioration in acoustic performance over time . It is therefore requested that acoustic barriers (Options 1 and 2 in Plate 4.1 of Appendix 12.10 [**APP-450**]) are reconsidered, based on re-assessment of the Value for Money appraisal assuming the average acoustic performance of a thin road surface over its lifetime.

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Applicant's Response	Provision of Low Noise Surfacing is a key element of the mitigation design of the Project, whereby the implementation of the highest HAPAS certified surface available at the time of writing is secured within commitment NV013 in ES Appendix 2.2: CoCP [**REP1-157**]. Assessment and consideration of the performance of the LNS has been undertaken wholly in accordance with the guidance of the DMRB LA 111. As such the Value for Money conclusions drawn in ES Appendix 12.10: Road Traffic Noise Mitigation and Cost Benefit Analysis [**APP 450**] remain valid.
Paragraph 12.46 **Page 84**	**Noise and Vibration (Asks)** The Noise Insulation Regulations Assessment [**APP-447**] should also be reviewed based on the updated road traffic noise predictions.
Applicant's Response	As is stated in paragraph 12.6.202 of ES Chapter 12: Noise and Vibration [**APP 150**], the final assessment of dwellings eligible under the Noise Insulation Regulations will be undertaken at Detailed Design stage. This assessment will use the traffic data and assumptions that is current at that time.
Paragraph 12.47 **Page 84**	**Noise and Vibration (Asks)** The Council would also like road traffic noise levels to be continuously monitored over the long-term to demonstrate that the low noise road surfacing proposals achieve the performance assumed in the assessment. This should comprise a single monitoring location in the Riverside Park/Thong Lane area, adjacent to the new road. This data should be audited annually to assess the need for earlier than scheduled intervention (surface replacement).
Applicant's Response	As set out in Section 12.8 of ES Chapter 12: Noise and Vibration [**APP 150**], for the reasons stated, it is not intend to undertake post completion noise monitoring in lieu of other mechanisms for compliance monitoring. The assessment completed for the Environmental Statement, set out in Chapter 12: Noise and vibration [**APP 150**], is based on calculated annual average road traffic noise levels with and without the proposed scheme to ensure a like-for-like comparison. Ambient noise levels are not constant and vary on a day-to-day basis depending on the contributions to the noise climate from factors such as traffic, railways, agriculture, industry, human activity, as well as weather conditions. To account for the varying nature of environmental noise, any monitoring would need to be over a very long period to gain average levels. Additionally, any noise measurement captured as part of the monitoring would likely be influenced by contributions from extraneous sources such as people, agriculture activities, and rail, etc. For these reasons, the comparison of a measured noise level with that predicted in a model space scenario is considered to provide an unreliable indication of scheme performance and cannot therefore be reasonably relied upon to base the conclusions of earlier surface replacement interventions. Section 4.2 of the Design Manual for Roads and Bridges (DMRB) LA 111, as referenced in Section 12.8 of the ES, states that routine operational noise monitoring '*cannot provide a reliable gauge for whether the predicted magnitude*

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	and extent of operational adverse impacts are greater or less than those predicted in the assessment' citing the reasons stated in the paragraph above. Checking that mitigation measures will perform as they should is best undertaken prior to or during installation. This would be undertaken through checks on the performance specification sheets of the products being supplied, confirmations of lateral extents, and locations of mitigation and on-site checks during installation. This way, any deviation can be identified early while there is still time to change, and any costly rectification is avoided. The product performance specification of operational mitigation measures (e.g. low noise surfacing, noise barriers) would be confirmed at the detailed design stage to ensure the chosen product used meets the performance assumed in the noise assessment. The Examining Authority (ExA) on other DCO applications, including the A428 Black Cat to Caxton Gibbet, A1 Birtley to Coal House and A1 Morpeth to Ellingham, accepted that through similar mechanisms inherent within their First Iteration EMPs, as those within the ES Appendix 2.2: CoCP [**REP1-157**], mitigation measures would be delivered to required design standards ensuring their effectiveness and the subsequent retention. In these cases, the ExA was satisfied that no operational noise monitoring would be necessary whilst ensuring mitigation as secured is both delivered and effective. It is therefore considered that these arguments from the A428, and other schemes quoted, relate to similar major road projects where the demands and expectations from stakeholders would be similar. As such, the mechanisms proposed in Section 12.8 of ES Chapter 12: Noise and Vibration [**APP 150**] and advocated by the DMRB LA 111, are concluded to represent a balanced and proportionate view on the issue of long-term noise monitoring in the conclusion of the performance of the mitigation proposed.
Paragraphs 13.20-13.22 **Pages 91/92**	**Population and Human Health (Tourism)** Whilst progress is being made to develop Gravesham's offer to visitors, it has yet to fully capitalise on the advantages of its location. These advantages make it possible for the area to become better known as a destination and as a base for a visit to London and Kent. Together they comprise a unique offer for visitors to the area. i. The Thames riverside and its history around shipping, immigration from overseas (Sikh population) etc. ii. Strong associations with important historic figures, including Charles Dickens, Pocahontas, General Gordon and others. iii. A unique 'cluster' of defence heritage, associated with the protection of London - New Tavern Fort, Shornemead Fort, the Woodlands Cold War bunker, Gravesend Blockhouse. iv. Industrial heritage derived from its Thames-side position and as a cradle of innovation in cement, paper, power and engineering.

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	v. Exceptional countryside with the Kent Downs Area of Outstanding Natural Beauty, Thames Estuary and popular country parks at Shorne Woods, Trosley, Camer Park and Jeskyns Forestry Park. vi. Historic landscapes at Cobham Park, Ashenbank Woods and Mausoleum, Cobham Hall. vii. Characterful rural settlements at Cobham, Luddesdown, Lower Higham, Sole Street and Meopham. viii. Gad's Hill Place – the home of Charles Dickens. ix. Cultural diversity with a range of cultural and community and the largest Sikh Gurdwara complex in Europe. x. A strengthening cluster of arts and cultural activity. xi. An expanding 'experiential' visitor offer, including the open air multi-sport centre at Cyclopark and Panic Room's cluster of escape rooms in Gravesend Town Centre. xii. Gravesham's leisure and entertainment facilities – in particular the Cascades Leisure Centre on Thong Lane Unfortunately, much of this offer will be negatively affected by the Lower Thames Crossing both in its construction and operational phases. Other parts of this LIR have provided, in more detail, the impacts that LTC will have on heritage but places like Cobham, Chalk and Gad's Hill, with clear links to Charles Dickens, will be fundamentally affected by construction (item iii and item viii above (BB_ NNN Higham PC Relevant representations too)) *(see Appendix 6 to the LIR).* Similar situation for the historic landscapes in item 6. Item 5, as well as the impact on the AONB, Shorne Woods, Jeskyns Forestry Park will be directly affected by LTC. Trosley and Camer Park will also be affected if our concerns about A227 and rat-running are realised. Similar situation for item vi.
Applicant's Response	The Council's response refers to Gravesend's general visitor offer, relating to its connections with important historic figures and its industrial heritage. ES Chapter 13: Population and Human Health has identified, in line with guidance, those assets and facilities which may be affected by the Project. The Population and Human Health assessment presented in Chapter 13 of the Environmental Statement has been undertaken in accordance with DMRB Standard LA112: Population and Human Health (National Highways, 2020). This identifies a variety of land-use categories that should be incorporated within the assessment and the study area to be considered (for the majority of land uses this is a study area extending 500m from the Order Limits). A number of the assets and facilities identified in Gravesham's response clearly fall under one or other of these categories, and are therefore included explicitly within the assessment presented in ES Chapter 13: Population and Human Health [**APP-151**] as follows: • The exceptional countryside of the Kent Downs Area of Outstanding Natural Beauty is noted; this asset is specifically referenced within paragraph 13.4.36 of ES Chapter 13: Population and Human Health. The Thames Estuary as a recreational resource (including various recreational routes) is referenced in several locations within

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	the Chapter under the heading of community land. Similarly, Shorne Woods Country Park and Jeskyns Community Woodland are included within the assessment, again under the heading of community land. • Cobham Hall Park and Garden and Ashenbank Woods are assessed under the headings of community land/assets. • The presence of settlements in and around the Project route have been referenced in Chapter 13 as part of the baseline information. Specific community assets and facilities within these settlements have been identified under the various headings of community land, community assets or businesses. It should be noted that Luddesdown, Sole Street and Meopham are outside of the 500m study area for Chapter 13: Population and Human Health. • Gad's Hill School has been identified as a community asset within Chapter 13 and assessed from the perspective of a school. The fact that the school was formerly the home of Charles Dickens has not been referred to specifically within Chapter 13; however, given that public visits to Gad's Hill Place is limited to a restricted series of booked tours each year (for 2023 there are seven tour dates listed on the website, with each tour limited to 16 people and requiring to be booked in advance), it is not considered that this use alters the conclusions of the assessment in terms of any significant change in usage numbers or visitor patterns. • Both Cyclopark and the Cascades Leisure Centre are included within Chapter 13 under the heading of "community land". Locations/facilities listed that have not been included within ES Chapter 13: Population and Human Health, together with the reasons why, are as follows: • Heritage assets including New Tavern Fort, Shornemead Fort, the Woodlands Cold War bunker and the Gravesend Blockhouse have not been assessed as part of ES Chapter 13: Population and Human Health, as they fall outside of the 500m study area. • Two scheduled monuments, New Tavern Fort (SM17) and Gravesend Blockhouse (SM16), along with recently scheduled Shornemead, have all been assessed in the ES Chapter 6: Cultural Heritage [AS-044] and in the ES Appendix 6.4: Coastal Fortifications Statements of Significance [**APP-357**], with neutral effects identified. • Both Trosley Country Park and Camer Country Park, located near to Meopham, have not been referenced within Chapter 13 as they fall outside of the 500m study area. • The Sikh Gurdwara in Gravesend and the Panic Rooms cluster of escape rooms within Gravesend town centre – these facilities fall outside of the 500m study area from the Order Limits and as such have not been included within the assessment specifically. In relation to Gravesham Council's comment about impacts during construction, the oTMPfC [**REP1-175**] identifies a range of stakeholder considerations in Table 2.3, many of which are relevant to the types of facilities referred to, including events and covering the need for advance warning and sensitivity. Section 5.3 of the oTMPfC relates to

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	significant events and seasonal traffic and highlights that, through engagement, relevant authorities may highlight seasonal peaks and events that they consider require the removal of traffic management.
Paragraph 13.23 **Page 92**	**Population and Human Health (Tourism)** Item ix, for a Borough of its size, Gravesham hosts a diverse variety of events and festivals. Many of these are community focused events, but a number have the potential to attract visitors from further afield, such as St George's Day Parade (April), Vaisakhi parade (April), Riverside Festival (July), the annual Fireworks display (November) and Christmas events. These are a big draw which generate spend in the local area, but these may not be so successful if not supported by visitor accommodation (see section later on housing and worker accommodation concerns). The Borough's experiential visitor offer (item xi) could be at risk if there is a reduction in visitors due to concerns over congestion impacts.
Applicant's Response	Control documents including the oTMPfC [**REP1-175**] have been secured in the DCO in order to ensure congestion impacts are reduced during the construction phase. The oTMPfC provides an outline framework that would be applied for the design, management and communication of construction traffic management, road space booking and transport logistics. As required by Requirement 10 of Part 1 of Schedule 2 to draft DCO [**REP1-042**], Contractors will be required to produce Traffic Management Plans (TMPs) for construction before commencing works. The oTMPfC will be used to inform the TMP which will be produced following engagement with the relevant highway and planning authorities, businesses and emergency services. The oTMPfC identifies a range of stakeholder considerations in Table 2.3, many of which are relevant to the issues raised by Gravesham in item ix, covering, for example, the need for advance warning and sensitivity relating to events in public parks and spaces, exhibition centres, recreational facilities, sports clubs and places of worship, particularly those events taking place in the evenings and at weekends. In relation to nearby events being held, the oTMPfC states that the TMP would address as a minimum '*closures/diversions to avoid such events and/or simultaneous activities as far as possible*'. Section 5.3 of the oTMPfC relates to significant events and seasonal traffic and highlights that, through engagement, relevant authorities may highlight seasonal peaks and events that they consider require the removal of traffic management.
Paragraph 13.30 **Page 95**	**Population and Human Health (Businesses and Business Disruption)** The proposed works will result in the displacement of a number of businesses for which alternative locations have often not been agreed. There are likely to be significant effects associated with moving business locations including loss of custom and the costs and expenditure associated with relocation.
Applicant's Response	ES Chapter 13: Population and Human Health [**APP-151**] identifies those businesses that would be subject to property demolition to enable construction activities and states that business owners and tenants would be able to claim compensation when their land or property is being compulsorily purchased, including, for example, the market value of

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	the land, disturbance compensation and injurious affection compensation (where the construction or use of the Project has reduced the value of the remaining land). Paragraph 13.6.105 of ES Chapter 13: Population and Human Health identifies a number of businesses otherwise affected during construction (for example, subject to temporary possession of land or directly impacted by construction activities) to the south of the River Thames. The Applicant has engaged with all known landowners and occupiers by writing to them to inform them of its willingness to discuss impacts of the proposals on their business, and compensation that may be available to them. They have also invited dialogue to acquire the land by agreement, as a result, the Applicant is in the process of engaging with a number of business owners and tenants regarding the Project. The status of such negotiations is set out in Annex B of The Statement of Reasons [**REP1-051**].
Paragraph 13.31 **Page 95**	**Population and Human Health (Businesses and Business Disruption)** The anticipated loss of Southern Valley Golf course, without like for like or alternative active leisure replacement, has been an issue that the Council has raised in its representations. This also relates to the loss of the pitch and putt course at the rear of the Cascades site, which is also a compulsory purchase issue as Gravesham Borough Council is the ultimate landowner.
Applicant's Response	As set out within the SoCG with Gravesham Borough Council [**REP1-100**] item 2.1.71, '*The Applicant notes that Southern Valley Golf Course ceased operations in August 2022 and is now in the ownership of The Applicant.* *The Applicant proposes to replace the area with equivalent scale of space in the form of public open space (Chalk Park which will be accessible and improve connectivity across the area and provide a recreational asset that is currently deficient in the area).* *The Applicant has provided further information as part of the updated Planning Statement (Appendix D)*'. The Applicant is working with Gravesham Borough Council and Swing Rite Golf Ltd to develop a feasibility study for re-arrangement of the facilities affected by the Project.
Paragraph 13.32 **Page 95**	**Population and Human Health (Businesses and Business Disruption)** As Swing Rite Golf Limited have explained in their relevant representation (RR-1042): • The adjacent Southern Valley Golf Club, which was an 18-hole course with clubhouse, has permanently close to make way for the route of the LTC. It was a predominantly pay and play based golf venue which opened around 1999; • We believe that the specialist golf needs assessment carried out in recent years regarding the potential loss of Southern Valley Golf Club did not deem the 18-hole course and clubhouse to be "surplus to requirements". Thus, given its significant loss to golf needs in the locality together with the disruption to Gravesend Golf Centre as it

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	currently is, we ask that the Secretary of State considers whether further mitigation by LTC is required by way of "new, improved or compensatory land or facilities".
Applicant's Response	As set out within the SoCG with Gravesham Borough Council [**REP1-100**] item 2.1.71, '*The Applicant notes that Southern Valley Golf Course ceased operations in August 2022 and is now in the ownership of The Applicant.* *The Applicant proposes to replace the area with equivalent scale of space in the form of public open space (Chalk Park which will be accessible and improve connectivity across the area and provide a recreational asset that is currently deficient in the area).* *The Applicant has provided further information as part of the updated Planning Statement (Appendix D)'.* The Planning Statement Appendix G: Private Recreational Facilities [**APP-502**] confirms that '*The benefits of the Project (including the need for the Project) outweigh the loss of Southern Valley Golf Club taking into account the positive proposal made by the Project to create Chalk Park which is an entirely new recreational site to be created in the same locality*'. The Planning Statement also confirms that, whilst the provision of Chalk Farm is not an identical substitution for the loss of private golf facilities, '*… it would significantly improve the general provision of green infrastructure and recreational facility in the same locality to counterbalance the loss of green infrastructure and recreational facility caused by the loss of Southern Valley Golf Club*'. On this basis, the Applicant concludes that the Project complies with paragraphs 5.174 and 5.181 of the NPSNN.
Paragraph 13.33 **Pages 95/96**	**Population and Human Health (Businesses and Business Disruption)** Another company affected are Baylis Landscape Contractors who are a longstanding family-owned landscape construction company. They operate from purpose-built offices, workshops and nursery on Thong Lane. We note from their relevant representation (RR-0091) that they contend the following: • The Applicant has given insufficient consideration to a possible land swap with adjacent land that could have accommodated replacement buildings for those that are having to be demolished as a result of the diverted High Pressure Gas Mains arising from the enabling works. • Instead of balancing loss of employment and likely extinguishment of a business, the applicant considers extensive environmental mitigation and public open space as being of greater priority. • The Applicant has failed to consider a temporary solution and a potential land swap in order for the Interested Party to continue to operate. Representations were submitted to the various design consultations suggesting solutions, but as it was felt that this was too difficult, the Applicants design has culminated in the entire area being permanently acquired.

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	• Whilst discussions continue for a possible acquisition by agreement, the lack of alternative sites to move to will almost certainly result in a business extinguishment case.
Applicant's Response	The Applicant has been constructively engaging with Baylis Landscapes Contractors since 2019. The Applicant has written a detailed response to the Baylis relevant representation cataloguing the extensive engagement to date. The Applicant has been attempting to facilitate an acquisition by agreement and relocation since 2020. It remains the Applicants preference to pursue a voluntary agreement that facilitates relocation (subject to the compensation code). Agreement has been reached on an updated Market Value and the Applicant has offered to support Baylis' agent in estimating a disturbance figure, in order to report a global compensation figure to Baylis for use in their relocation search(es).
Paragraph s13.35-13.38 Page 96	**Population and Human Health (Businesses and Business Disruption)** There is currently no statutory compensation for businesses affected by road works i.e. from loss of business or additional costs incurred caused by roadworks, or other disruptions on the highway. Successive governments have taken the view that businesses should not have the right in law to any particular level of passing trade, and that traders must take the risk of loss due to temporary disruption of traffic flow along with all the other various risks of running a business. Therefore, there is no statutory provision for compensation by the Highway Authority (as opposed to a utility) if a business is affected by roadworks. National Highways' policy, 'Your property and compensation or mitigation for the effects of our road proposals19', simply refers to and re-states legislation that provides LTC with options for mitigating scheme impact both to the environmental and to local residents. The measures for local residents include options in respect of increased noise (including planting, noise insulation and noise payments), expenses for suitable temporary moves and off-line discretionary home purchase. The policies, in most cases, do not go further than the statutory position and provide limited comfort due to their discretionary nature and lack of specific details (including application process, response timeframe and support etc.). Further no support is offered for local businesses or other property uses outside of residential. The view appears to be that the businesses should acquire relevant business interruption insurance to cover such losses. Business interruption risk refers to the financial loss a company suffers when its operations are disrupted. This loss includes both observable components, such as reduced sales and increased cost of working, and hidden components, such as loss of future revenue streams due to potential reputational damage. Unfortunately, guidance from the Association of British Insurers (ABI) is that business interruption insurance covers a business for loss of income during periods when they cannot carry out business as usual due to an unexpected event. The problem is that impacts from the construction of the Lower Thames Crossing would not be considered as unexpected as the proposal has been in the public domain for many years. The Borough Council would also query

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	whether different considerations apply because of the duration of the construction works. Business interruption insurance will compensate the business for: • any (pre-tax) shortfall in profits • any increased costs of running their business as a result of the event
Applicant's Response	Compensation is available to those who have land affected by the scheme, and this includes businesses along the route. Where no land is taken or physically impacted, no compensation will be payable but the Applicant has developed a comprehensive set of mitigation measures set out in control documents (referred to in Table 14.1 of the Introduction to the Application [**APP-003**].
Paragraph s13.39-13.44 Page 97	**Population and Human Health (Businesses and Business Disruption)** When developing the Sizewell C project, EDF Energy recognised that their project, with its large increase in local employment and business opportunities during the construction phase, offered significant opportunities to maximise and support the uptake of local socio-economic benefits through targeted enhancement, initiatives and support. However, EDF Energy also recognised that there is also the potential for the Project to cause local disruption which could have adverse socio-economic impacts, prior to mitigation. It realised that additional transport movements in the local area may well create road congestion which will have a direct impact on the local economy if the movement of businesses, workers and customers is impeded. It is also recognised the impact of the perception of congestion on the local economy, as customers are discouraged from visiting businesses in an area that they believe will be congested. Evidence is emerging that transport congestion is leading to negative economic impacts in the local area around Hinkley Point C. The Silvertown tunnel project also understands this and requires that socio-economic monitoring is undertaken20. Transport and congestion will be dealt with as a separate major issue, and the need for mitigation to minimise transport disruption is clear. Gravesham has a high proportion of SMEs and SMEs can be especially vulnerable against potential risks and unforeseen events. Therefore, not providing mitigation is likely to have a significant impact on local businesses. The Council in its s106 asks has suggested a mechanism for business disruption and support (AS-070). Year on year the council has been receiving less funding from Central Government and since 2019 there has been no further direct grant funding, with the expectation that the council will become self-sufficient in its' funding from local sources. A greater part of business rates (75% of growth in National Non-Domestic Rates) can be retained locally, placing an even greater incentive on the council to create the conditions for business growth, which we are doing but the Borough Council recognise that all this effort could be lost because of the impact of LTC.

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Applicant's Response	It is not accurate to suggest that EDF Energy considered that Sizewell C '*had the potential for the Project to cause local disruption which could have adverse socio-economic impacts, prior to mitigation*'. There is no mitigation to suggest this within that Project's Deed of Obligation, and no assessment of significant effects within the Socio-economic chapter for the application. The Applicant notes that socio-economic monitoring secured by the Silvertown Crossing DCO is intended to monitor changes in travel behaviour (notably cross-river) pre- and post-opening of the tunnel, rather than to monitor congestion during construction specifically. The Applicant notes that measures are in place through the oTMPfC [**REP1-175**] to minimise disruption to local residents and business during the construction phase.
Paragraph s 13.45-13.48 **Pages 97/98**	**Population and Human Health (Property and Housing – Traveller Sites)** As set out in APP-151, residential areas within 500m of the Order Limits include the outskirts of Strood, the villages of Shorne, Thong and Cobham and eastern suburbs of Gravesend (notably the Singlewell, Riverview Park and Chalk areas), together with isolated rural properties. APP-319 Properties and Businesses at Risk of Demolition sets out what will lost in Gravesham. Paragraph 13.4.6 advises that two privately owned traveller sites have been identified to the south-east of Chalk, at the point where Rochester Road becomes Gravesend Road. The two sites are next to each other but each with its own access. Whilst the majority of both sites are outside the Order Limits, a 10m strip of each property's title fronting Rochester Road is within the Order Limits to allow for the diversion of utilities. Plate 1.3 in the Construction Supporting Information (APP-335) shows the indicative layout for Southern tunnel entrance compound. This does show both sites are surrounded by offices / welfare and workshops with the indicative haul route running to the rear of their properties. This is concerning as the structures and their inhabitants are likely to be more vulnerable than bricks and mortar to noise and vibration impacts. Plan 1.3 also shows that Polperro, which is also located off the Rochester Road, will be surrounded by soil storage. Table 13.68 in APP-151 is a human health assessment of the construction phase. Within the section of that table looking at the housing and community services, is a highlighted section on the 'Impacts on Traveller Communities'. Whilst its focus is the site in Thurrock which is being permanently acquired for the project, it does note other traveller communities impacted during construction include privately owned sites at …. Gravesend Road sites (Gravesham). It determines that the nature of the impacts at these locations are, for the two sites accessed from Gravesend Road, impacts associated with residential amenity due to the proximity of construction activity. National Highways' health outcome is that health impacts relating to traveller communities are likely to be primarily associated with mental wellbeing, and it determines that the health outcome is considered to be neutral. This is

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	because the ES is only looking at significant effects rather than the fact that for those affected families, the impacts will be huge.
Applicant's Response	As stated in ES Chapter 13: Population and Human Health [**APP-151**], the Applicant understands that the two sites referred to are likely to be affected by environmental change during construction and operation. The sites, which are privately owned, have received information about the Project as part of statutory and non-statutory consultation, including letters and leaflets as appropriate. Residential amenity relates to the combination of noise, air quality and visual impacts. Appendix B (National Highways EqIA Screening Template) of the Health and Equalities Impact Assessment (HEqIA) [**APP-541**] specifies that assessments of potential noise impacts have been undertaken for all travellers' sites potentially affected by construction activities, including the sites located off Rochester Road in Gravesham. In order to mitigate the potential for significant effects, best practice measures (BPM) and other construction phase mitigation would be implemented through the controls inherent within the REAC (Chapter 7 of the ES Appendix 2.2: CoCP [**REP1-157**]). Additionally, under the controls within the CoCP, when further details of the construction method and design are known, the Contractors would develop a Noise and Vibration Management Plan (REAC commitment NV002) to control noise as far as reasonably possible under BPM. As such, it is concluded that construction noise would be suitably controlled to a level where it would not constitute a significant effect at any of the traveller's sites identified and assessed. In relation to air quality impacts during construction, the ES Appendix 2.2: CoCP [**REP1-157**] also sets out the air quality and dust monitoring commitments to be undertaken by the Contractor during construction (commitments AQ005 to AQ008). Finally, in terms of visual impact, an earth bund of approximately 2–3m in height formed from material excavated onsite, would be sited along the boundary of the southern tunnel entrance compound, as material becomes available to facilitate visual screening for residential properties on Thong Lane and Rochester Road (A226) during construction.
Paragraph s13.49-13.54 Page 99	**Population and Human Health (Agricultural Land Holdings)** The development of the DCO site will result in the loss of Grade 1, Grade 2 and Sub-Grade 3a agricultural land which would be considered best and most versatile land. This is not just to the roads and immediate environs but also to the extensive areas of planting for mitigation and compensation. There appears to be that there would be no mitigation for the loss of this land so major adverse effect on agricultural land resource. In these circumstances due consideration should be given to the loss of this land on the rural economy. Table 13.20 (APP-151) details the agricultural land holdings affected within the Order Limits – south of the River Thames

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	Paragraph 13.4.90 explains that the agricultural land use south of the River Thames is predominantly arable with limited areas of pasture. There are a total of 27 identifiable agricultural landholdings or groupings of landholdings south of the River Thames, as detailed in Table 13.20. These range from very small landholdings (single fields) to landholdings in excess of 350ha in size. Paragraph 13.6.122 say during the construction phase, 27 landholdings would be temporarily affected, of which 20 would experience moderate to very large adverse effects, which would be considered significant. Overall, following the reinstatement of land required temporarily by the end of the construction phase, 20 landholdings agricultural use would be permanently affected, of which 11 would experience moderate to very large adverse effects, which would be considered significant. Paragraph 13.6.123 says compensation would be payable in accordance with the Statutory Compensation Code. Consultation with landowners, occupiers and agents would continue as the Project develops to manage and reduce impacts on property owners as far as reasonably possible The PEIR summary 201821 noted that the "loss of agricultural land and disruption to agricultural business operations" would be an issue for the construction phase. It then advised that where possible, land needed for construction will be returned to agricultural use once construction is complete. This has not been the case in some areas in Gravesham.
Applicant's Response	As set out in the SoCG between the Applicant and Gravesham Borough Council [**REP1-100**] at item 2.1.13: '*The Applicant notes that the draft DCO obliges the Applicant to return temporary land to the reasonable satisfaction of the landowner.* *Therefore, reinstatement will be agreed with landowners following use by the Project.* *Landowner losses as a result of the Project's temporary occupation will be payable in line with the Compensation Code.* *The Applicant recognises that Gravesham Borough Council's concern relates to land-use viability in its existing use, rather than landowner compensation.* *Effects on the agricultural economy and land use are considered within ES Chapter 13 Population and Human Health*'.
Paragraph s13.55-13.61 Pages 99-101	**Population and Human Health (Loss of Cobham Services)** When in 1968 when the A2 was widened, a service station soon opened on each side of the road by and opposite Scalers Hill, Cobham. Both sides had an Esso petrol station and a Little Chef positioned close to it. The eastbound Little Chef closed in 2007 and when the A2 was widened in 2009, and the eastbound petrol station and restaurant were both demolished. It is worth noting that another petrol station – westbound at the Tollgate – was also demolished at this time.

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	The westbound Cobham Services restaurant closed in 2007 too. The westbound filling station was then rebuilt in around 2011, taking over the abandoned building to make way for a much larger forecourt. The site was sold to MRH in June 2015 and an extensive refurbishment was carried out to the shop in Autumn 2017 to expand the offer. When National Highways undertook their statutory consultation for LTC in 2018, they published a "Lower Thames Crossing - Design, construction and operations" document22 . This document advised that Cobham Services on the A2 would be removed as part of the Project and that it "cannot be replaced due to lack of available land and unsuitable access". In paragraph 12.4.5, they had included the potential provision for a rest area in the form of a rest and service area (RaSA) accessed from the Tilbury junction south of the Tilbury loop railway near East Tilbury. The proposed RaSA, if built, would be to the north-east of the Tilbury junction and would be combined with a maintenance depot. The strategic need and reasoning for providing a RaSA was then set out in paragraph 12.4.6 and included: d. Refreshments are an important part of any rest break when undertaking a journey. The RaSA would include facilities for hot and cold refreshments, which would allow customers to obtain food and drinks. This would provide important nutrition, reducing fatigue for drivers when continuing their journey. e. The nearest sites are at Medway on the M2, Maidstone on the M20, Clacket Lane, Thurrock and South Mimms on the M25 and Birchanger on the M11 as shown on Figure 12.3. f. A fuelling station on the A2 (Cobham) will be removed as part of the Project and cannot be replaced due to lack of available land and unsuitable access. g. Hence the absence of an RaSA for journeys along the Project's route would mean exceeding the advised journey times between sites. h. There is a government commitment to provide frequent electrical charging points due to the increasing use of electric and hybrid vehicles National Highways has removed the proposal for a RaSA at Tilbury but has not proposed replacement facilities for those being lost at Cobham. This is concerning considering the bullet points in the Statutory Consultation document about rest breaks and driver fatigue, exceeding journey times, electrical charging points etc have not changed. A junction, albeit not connected to the local road network for normal use, has now been reintroduced at the northern portal in Thurrock, but no proposals have been made to reintroduce a service area.
Applicant's Response	The Applicant recognises Gravesham Borough Council's concern relating to the loss of a service station at Cobham as a result of the Project citing issues relating to refreshment, fuelling and electrical charging points. The Applicant's position on the matter is set out within the SoCG between the Applicant and Gravesham Borough Council [**REP1-100**] at item 2.1.44 which states:

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	'*It is not agreed that additional provision should be considered as part of the Project, but will be considered by The Applicant Operational Directorate across the Strategic Road Network.* *Recognising that lorry parking is a multi-agency issue, The Applicant's Operational Directorate will be setting out its position across the Strategic Road Network through its Route Strategies and in considerations for RIS3 (see Vision for Route Strategies). This will be informed by a consultation exercise looking into why there has not been more roadside facilities and lorry parks developed in the north east quadrant of the M25*'. The Applicant notes that the DCO is being developed in accordance with national guidance and latest policy in road user emissions. As a consequence, the DCO submission is not linked to any further additional initiatives by the Applicant generally, or the Project locally, relating to road user emissions. Through Project Rapid, the Applicant is committed to increasing the number of rapid charging points at existing Motorway Service Areas on the strategic road network. This will not be delivered at a Project level and would be delivered at a strategic regional/national level to ensure the most effective rollout to meet growing demand for EV infrastructure. The Applicant considers that a roadside facility does not necessarily need to be on the Lower Thames Crossing for the Project to operate safely. The Applicant has established a Roadside Facilities Working Group to encourage suitable new developments in areas of the network where there is a need, and a Working Group strategy would potentially bring forward suitable facilities faster than if included within Lower Thames Crossing. This is a wider issue occurring on roads within and outside of the Project area, and will be considered by the Applicant's Operational Directorate across the SRN. The Applicant is improving the power infrastructure to provide rapid charging at roadside facilities in the proximity of Lower Thames Crossing, namely Maidstone and Clacket Lane West and East. The Applicant's Operational Directorate will be setting out its position across the SRN through its Route Strategies and in considerations for Road Investment Strategies 3 (RIS3) (see Vision for Route Strategies (National Highways, 2021)). This will be informed by a consultation exercise looking into why there has not been more roadside facilities developed in the north-east quadrant of the M25. As such, it is not agreed that additional provision should be considered as part of the Project, but will be considered by National Highways Operational Directorate across the SRN. National Highways recently conducted a consultation exercise (as referred to above in a previous iteration of the SoCG) looking into why there has not been more roadside facilities and lorry parks developed in the north-east quadrant of the M25. The findings were fed into the Route Strategies.

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Paragraph s13.76-13.80 Pages 104-106	**Population and Human Health (Walking and Cycling Networks - Construction)** The project construction process results in: • Closure of all existing PROW routes between A2 and the A226 including NCN177 in the construction area • Loss of footpath NS367 linking Henhurst Road with A2 (and thereby Cobham South Services) – this is not shown on the plan to avoid clutter • A new footpath within one month of closure from Marling Cross to the corner of Riverview Park round the back of the existing development replacing NS169 & NS174 • From the corner of Riverview Park where will be temporary path parallel with Thong Lane to the village thereby maintaining a link to the rural area from Riverview Park. This link will be finalised when the Thong Lane north Green Bridge is complete. In the interim it will be crossed by a haul route connecting the works together. The existing road has no footway, but as the Strava data shows well used. • A226 is disrupted by construction of the works site accesses and by the additional construction traffic that will use it to access the construction sites • NCN177 is diverted south via Jeskyns and Ashenbank Wood and then NS179 to Park Pale (between HS1 and Cobham Park) with appropriate surfaces (which are removed post construction) • The use of Hare's' bridge #2 is proposed. The parapets on the A2 bridge were designed (2007) to allow pedestrians, cyclists and horse rides to cross. The bridge over HS1 however is lower and horse riders need to dismount – so ideally the parapets need raising. These are stainless steel capping on the basic concrete structure following the HS1 house style (same situation applies at Hare Bridge #1). • NCN177 west of Marling Cross along the old A2 may suffer some minor disruption whilst the new underground electricity cable is installed • NCN1 (NG2) Thames & Medway Tow Path is disrupted whilst access is obtained to the Milton Construction site and to remove the tunnel boring machine • NG3 it is assumed is not affected by mitigation works on the marshes Note that Brewers Road is closed for 19 months thereby cutting north south communications in that area for all users. At that time it is essential that a Thong Lane Bridge (old or new) along with Park Pale is available for use by pedestrians, cyclists and horse riders. Riverview Park to Rochester Road is the worst affected with 100% increase in length all of it on footway. Other routes significantly affected are from the Thong Lane/Rochester Road junction to the southeast. NCN177 is diverted on a convoluted route via Jeskyns, Ashenbank wood (SSSI) and NS179 which runs between HS1 and the boundary of

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	Cobham Park. The Council has major concerns over the impact of the installation of surfaces in the latter two locations (even if they are removed later). The overall impact, taking length of time into account is MAJOR ADVERSE. It should be noted that the two new routes in the construction area may be subject to considerable disturbance from that activity and may be rerouted whilst specific activities are undertaken (e.g. gas pipeline or electricity line diversion). It has been assumed that a Thong Lane bridge (existing or new) will be available at all times to reach Shorne Woods Country Park off Thong Lane. This is particularly important as an alternative to Brewers Road when that is closed. Also that a walking and cycling route through Marling Cross junction to the south is maintained. There may need to be some very short term closures during the construction process. On the basis of the current information it is assumed that the picture given above will exist for at least 5 ½ years. The implications are not therefore short term but subsist over a substantial period. Access to some facilities could of course be by car (Shorne Woods CP or Jeskyns or little Woodlands Trust car park on Halfpence Lane). This is not very sustainable and will subject to the disruption brought about by the construction works, including the Brewers Road closure.
Applicant's Response	It is noted that there are considerable construction activities required to the south of the River Thames, which may last for a total duration of over five years. During this time, there would be periods of low, medium and high intensity activity at various locations and depending on various tasks. Initial works comprise those activities that prepare the site and the compounds for the main construction activity, and could include elements such as ecological mitigation, establishing haul roads, securing works areas including PRoWs, and construction compound set-up activities. Construction of the Project would require the temporary closure and/or diversion of some existing footpaths and roadside footways, as well as some bridleways and cycleways. PRoWs that would be severed or temporarily affected by construction activities (for example utility diversions or main works) are described in ES Chapter 13: Population and Human Health [**APP-151**], and in the Transport Assessment [**APP-529**]. Section 7.5 of the Health and Equalities Impact Assessment (HEqIA) [**APP-539**] covers the impacts of the Project on active travel during both the construction and operation phases. Paragraphs 7.5.17 and 7.5.18 notes that the impact on footpaths (including roadside footways), cycleways and bridleway links along the route of the Project has been reduced, in so far as reasonably practicable, through the design process. The general approach to mitigation includes constructing new PRoWs before closing any existing PRoWs, where reasonably practicable. Where site haul routes created next to the Project route would cross the existing PRoW network, active control measures would be implemented to manage the safety of PRoW users and could include staffed crossings and the provision of temporary gates or signals, which would be removed on completion of the works. Construction works would be planned to reduce the durations when footpaths, cycleways and bridleways would need to be closed. Other mitigation measures would include early engagement with members of the public and relevant stakeholders (for example, local walking groups), to ensure that any closures and diversions are notified in advance, with clear and concise signposting for any temporary diversions, and the use of social media to update

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	members of the public regarding any active closures and diversions (these measures are secured in the REAC (commitment PH001) contained in ES Appendix 2.2: CoCP [**REP1-157**]. Requirements for walkers, cyclists and horse-riders are included in the oTMPfC [**REP1-175**] and will be addressed in the Traffic Management Plan. Appendix A of the oTMPfC details an illustrative list of envisaged traffic management measures during the construction period. This includes measures on Thong lane which is not expected to be closed for longer than a weekend at any given time. During the Brewers Road bridge closure, Thong lane would need to be kept open and maintained (with the exception of short-term night/weekend closures). Appendix B of the oTMPfC details mitigation measures to be undertaken until completion of and opening of the permanent routes. This includes details on NCN177, for which the project would provide and maintain a suitable alternative diverted shared footway/cycleway route connecting Rochester and Gravesend prior to closure of the existing NCN 177 commuter route. The preferred temporary diversion route runs to the south of the A2 linking points 11/1, 11/7, 11/3, 11/4, 11/9, 11/8, 5/14, 5/3, 5/9, 12/3, 6/11, A11, 6/44, 6/46, 6/48, 8/21, 8/22, 6/35, 8/25, 8/26 and 10/4 as shown on Rights of Way and Access Plans Sheets 3, 4, 5 and 6. Alternative routes or sequence may be proposed but these must be agreed with the relevant local authority. Details on the temporary NCR177 route through Jeskyns and Ashenbank can be found within Project Design Report: Part E: Design for Walkers, Cyclists and Horse Riders [**APP-512**]. A commitment to securing mechanisms during the detailed design and build process with regard to surfacing can be found within Design Principles [**APP-516**], that will ensure the Contractor will develop the design of the temporary cycle route within certain parameters. Further engagement with Forestry England and the Woodland Trust will be undertaken at detailed design.
Paragraphs 13.83-13.88 Pages 107/108	**Population and Human Health (Walking and Cycling Network - Operation)** Operation impact is much less and is combined with the creation of a number of new routes. These are of course impacted by noise and disturbance from both the A2 and the A122. The major diversions are to NS174/NS167/NS169 south of Riverview Park, to NG7 from the junction of Rochester Road/Thong Lane and NCN177. During consultation there was an option for a footpath link across the northern part of the A122 junction, south of Riverview Park, but this resulted in a convoluted route with significant changes in level to pass over/under slip roads. It was felt on balance diversion via Thong Lane north Green Bridge was preferrable. NG7 originally was to cross the A122 over cutting leading to the tunnel portal on a bridge, however it was feared that because of its height it could become attractive to those wished to commit suicide. When the tunnel portal was moved further south an alternative diversion was produced round the portal and over the tunnel.

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	NCN177 is rerouted to run alongside the extended Darnley Lodge Lane, but still next to the A2/A122 junction with its numerous slip roads. This involves a complicated route through Marling Cross Junction and the crossing of Darnley Lodge Lane at a point where it is carrying slip road traffic. This is a significantly worse route than the current one. Key assumptions are: • All links shown on the plans are constructed for the operational phase, albeit precise alignments may vary • Agreement has been reached on the precise legal status and surface of the various new routes • All routes and structures (where appropriate) are designed to LTN1/20 standards and appropriate safe provision is made at crossing points of the highway network as appropriate to the volume and speed of flow Overall assessment is MINOR ADVERSE.
Applicant's Response	The Applicant can confirm that all links on the plans would be constructed for the operational phase. The Applicant has set out within the Application a standard and well-versed proposal for agreement of legal status and surface of new routes. The Applicant confirms that all routes and structures (where appropriate) are designed to LTN1/20 standards and appropriate safe provision is made at crossing points of the highway network as appropriate to the volume and speed of flow. Article 10(1) of the draft DCO [**REP1-042**] provides that where a new local highway is constructed, it must be completed to the reasonable satisfaction of the local highway authority, who becomes responsible for its maintenance from completion. The Applicant has set out some relevant information to these issues within the SoCG between the Applicant and Kent County Council [**REP1-103**] at items 2.1.120 (DL-1) and 2.1.121 (DL-1), and through information provided via direct engagement outside of the SoCG process – in summary: • *'WCH routes within Kent are shown on the General Arrangement drawings found within the General Arrangement Plans (Volume B) [**APP-016**].* • *The proposed WCH routes are also shown within the Rights of Way and Access Plans (Volume B) [**APP-025**]. These drawings should be read in conjunction with the draft DCO [**AS-038**], with reference to Schedule 4 – Permanent Stopping Up of Streets and Private Means of Access.* • *Details on all WCH routes can be found within the Project Design Report – Part E – Design for Walkers Cyclists and Horse riders [**APP-512**]. The design specifications for these WCH routes will be dependent upon the environment within which they are located and their intended users.*

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	• *Defining the widths/surfacing will be undertaken at the detailed design stage. Specific WCH design principles can be found within Table 4.1 Project-wide design principles: Connecting people within the Design Principles. All WCH routes will be designed to the latest design standards and guidance listed under Clause No. PEO.04.' (item 2.1.120)* • *'…Part E of the Project Design Report sets out the preliminary design for PRoW and permissive paths including diversions, resurfacing/upgrades, crossings, designations; and the Design Principles sets out how the Applicant and Contractor must consider and accord with design guidance/standards as set out in PEO.01 to PEO.13.* • *The Applicant and Kent County Council are working on Side Agreements which would set out how assets would be transferred to the Local Highway Authority, including resourcing for appropriate design input and sign-off on completion'. (item 2.1.121)* The Applicant has set out its position relating to this matter within the SoCG between the Applicant and Kent County Council [**REP1-103**] at item 2.1.123 (DL-1). In summary: '*A WCH strategy has been developed that includes new or improved pathways and bridges, which are designed to encourage active travel and promote health and wellbeing across the region. These WCH routes will provide access between parks, woodlands, heritage sites and employment centres in Kent, Thurrock, Brentwood and Havering. Both formal PRoWs and permissive routes have been informed by the surrounding environment and through discussions with landowners. Please refer to the Project Design Report: Part E Walkers, Cyclists and Horse Riders* [**APP-512**] *and Chapter 5 of the Planning Statement* [**APP-495**] *which provides our WCH strategy*'.
Paragraphs 13.90-13.95 Pages 108/109	**Population and Human Health (Access to work, community, recreational, education and healthcare facilities)** In table 13.68 "Human health assessment – construction" of ES Chapter 13 (APP-151), National Highways recognises that access to jobs, services and community infrastructure may be impacted as a result of increased journey times during construction. They consider, however, this will be managed through measures set out in a Traffic Management Plan (TMP) and appropriate communication with local residents and affected communities. National Highways does recognise that negative effects may be experienced by more vulnerable populations who are more dependent on public transport use and therefore may have less choice around mode of transport and route. Whereby increased journey times for buses using the local road network may have an impact in relation to accessing services and employment for these groups, although it is noted that these impacts would be temporary in nature (although long-term, i.e. longer than two years). The link between being able to access jobs, services and social opportunities and people's health and wellbeing is well documented. At the same time, reducing health inequalities and promoting opportunity is a widespread aim, but both of these areas can be influenced by changes in accessibility and how it may affect populations disparately. Earlier in this

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	section, we have provided information on the low level of 'percentage change in employees' and this is partly due to the lack of alternative employment opportunities within the Borough. We want National Highways to support employers in dealing with these issues for mutual benefit i.e. to keep both their business running and reduce impacts on their workers. This will be especially important for employers, such as the Port of London Authority, who are delivering a service of national importance. Whilst National Highways recognise that the number of people potentially impacted by changes in accessibility during the construction period is likely to be high, relating to communities along the route and within a wider geographical area, there response is limited and focuses on communication. The Council does not consider that this is sufficient. The Outline Traffic Management Plan for Construction (oTMPfC) (APP-547) was included within the project's submission documents following feedback from the Planning Inspectorate. It is intended to provide a framework of principles and mechanisms to inform how detailed secondary consent traffic management plans will be developed.
Applicant's Response	During construction, a number of stakeholders are likely to be impacted as a result of the works. The oTMPfC [**REP1-175**], Table 2.3 lists the envisaged affected groups, lists their outline requirements, and also details how the Traffic Management Plans (developed by the Contractors) would address their requirements as a minimum.
Paragraphs 13.97-13.99 Pages 108/109	**Population and Human Health (Access to work, community, recreational, education and healthcare facilities)** Table 2.3 of the oTMPfC includes a schedule of stakeholder considerations that would need to be made in production of the Traffic Management Plan (TMP) for secondary consents. It recognises that a range of groups and organisations will be affected, including the emergency services, and how they will be affected may be different. It then lists a number of factors will need to be considered when producing the TMP, including: • Journey time reliability • Safety during journey through traffic management • Advance communication / warning • Breakdown recovery • Access for deliveries / visitors / workers • Clearly signed and segregated diversion and access routes This recognition is welcomed but the Council does not consider that it goes far enough. The construction period is lengthy and the distress and damage caused by the construction period has the potential to disrupt the lives of local people and businesses to a huge extent. For example, local schools are listed with issues such as "Access/egress for staff and students" and "unhindered and safe WCH routes", but this is only a fraction of the issues that we have identified that need to be addressed. We do note that in Table 13.68 'Human health assessment – construction' in

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	chapter 13 (APP-151) it advises that a range of measures are in place to ensure that active travel routes for children are not adversely impacted by the Project and to enable communication and engagement with individual schools. However, this are not articled in the documents. The Council, in AS-070, has raised concerns over construction disturbance with increased journey times making affected schools less attractive to staff and also cause problems for parents picking up / dropping off children. The Council has suggested National Highways funding extended opening hours of schools so that children can be dropped off earlier and picked up later, whilst also highlighting that, in some cases, children may need alternatives ways to get to school i.e. bus pass, cycle, taxi. This is particular important when potentially life impacting events, such as examinations, are taking place and the children need to be supported to realise their potential.
Applicant's Response	Table 13.68 of ES Chapter 13: Population and Human Health [**APP-151**] notes that a range of measures are in place to ensure that active travel routes for children are not adversely impacted by the Project, and to enable communication and engagement with individual schools. These are set out in further detail in paragraphs 7.5.25 to 7.5.29 of the Health and Equalities Impact Assessment (HEqIA) [**APP-539**] and include the following: • Measures in place in the oTMPfC [**REP1-175**] which must be addressed in the Traffic Management Plan in relation to access/egress to schools, and the requirements for local schools to have unhindered and safe walking and cycling routes. • The Schools Engagement Plan for the Project has been used to record feedback about matters/concerns that individual schools express and as a basis to discuss various environmental matters, including those relating to access/travel to school. • The ES Appendix 2.2: CoCP [**REP1-157**] states that the Contractor's Engagement and Communications Plan (ECP) will specify a detailed programme of community engagement for specific stakeholder groups, including schools, identifying proposed methods and likely timing of consultation activities during the construction period. In addition, the Stakeholder Actions and Commitments Register (SAC-R) [**REP1-176**] includes a commitment for the Contractors to develop and provide an educational road safety programme for school aged children at relevant local schools along the Project route. Table 2.3 of the oTMPfC is designed to give an outline of the groups likely to be impacted, their requirements, and how the Traffic Management Plans would address the requirements. The Traffic Management Forum (as detailed in the oTMPfC) would be the appropriate forum to discuss issues and develop mitigation measures where required. Table 2.3 of the oTMPfC does list "local schools" as an affected stakeholder, and includes how the Traffic Management Plans would address their requirements, including stating that Project-related HGV movements would not be allowed to pass school entrances during drop-off/pick-up times.

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Paragraphs 13.100-13.102 Page 110	**Population and Human Health (Access to work, community, recreational, education and healthcare facilities)** The Thames View Crematorium is considered within Chapter 13 (APP-151) as it is located on Gravesend Road and attracts trips from across a wider area, including routes potentially affected by the Project. It is also just 10m for the Order Limits. Table 13.23 "Minor roads and other WCH routes affected by the Project – south of the River Thames" notes that one of the facilities accessed via Gravesend Road includes the Thames View Crematorium and Cemetery. The oTMPfC [**APP-547**] highlights cemeteries and crematoria specifically as stakeholders who may have particular requirements and outlines how these would be addressed in the TMP as a minimum, including: • For access and egress to be maintained throughout the construction period with the exception of night-time and weekend closures when required for specific planned works • Advance warning and particular sensitivity around significant events particularly at evenings and weekends. When a loved one dies, it is a time of grief, confusion and upset. As the Council's elected members have highlighted at various briefings with National Highways, the closeness of the works to the Thames View Crematorium and Cemetery raises multiple concerns. Key within those concerns have been traffic congestion leading to uncertain journey times, with the uncertainty itself potentially adding to the impact of the loss on the affected parties. This is not a purely hypothetical view as Members have verbally advised of the delays that have occurred when issues on the strategic road network have led to severe congestion and rat running in the urban area. The primary access to the A226 Gravesend Road compound will be from the A226 Gravesend Road, which also is the only route for accessing the Thames View Crematorium and Cemetery. The Thames View Crematorium and Cemetery has a 27-acre Memorial Park which includes the crematorium, a formal cemetery, a woodland burial area and extensive areas laid aside for wildlife. Currently it is a very tranquil setting to enable relatives and friends to grieve, and this will be degraded as a resource for the grieving process by the nearby works. The works will also impact on the important role that St Mary's Church at Chalk has within the community and the well-being support and guidance it provides.
Applicant's Response	The Applicant is aware of the sensitivity of facilities such as the Thames View Crematorium, Cemetery and associated Memorial Park, and of the vital role these facilities play at a key time in people's lives. It is for these reasons that the oTMPfC [**REP1-175**] highlights cemeteries and crematoria specifically as stakeholders who have particular requirements and that these would be addressed in the TMP, particularly in relation to access and egress and the need for advance warning and particular sensitivity around events at evenings and weekends. The role of St Mary's Church at Chalk is noted. The oTMPfC [**REP1-175**] similarly lists places of worship as stakeholders who may have specific requirements that need to be addressed in the Traffic Management Plan. In order to mitigate the potential for significant noise effects during construction, best practice measures (BPM) and other construction phase mitigation would be implemented through the controls inherent within the REAC)(Chapter 7 of tS

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	Appendix 2.2: CoCP [**REP1-157**]). Additionally, under the controls within the CoCP, when further details of the construction method and design are known, the Contractors would develop a Noise and Vibration Management Plan (commitment NV002) to control noise as far as reasonably possible under BPM. As part of the design evolution for the Project, comments received during the 2016 public consultation were taken into account, which led to the South Portal being moved further to the south, thereby having a lesser impact on St Mary's Church and its relationship with the nearby community of Chalk. This is set out in the Project Design Report Part G: Design Evolution [**APP-514**]. The oTMPfC (Section 4) outlines the routes HGV construction related traffic would utilise which includes the A226. The Applicant understands the sensitivity and has listed the crematorium as an affected stakeholder in Table 2.3 of the oTMPfC. Whilst it is likely there will be some impact during construction, the TMF would be the appropriate place to discuss and develop mitigation measures with the appointed Contractor. This may include discussing particular sensitive times and working with the crematorium to reduce use of the A226 at certain times where possible to reduce impact and disturbance.
Paragraphs 13.105-13.111 **Page 111**	**Population and Human Health (Work and Training)** As the Council has highlighted in its relevant representation, it is often difficult to see what benefit Gravesham gains from the scheme, both during construction and operation. During construction, on the plus side, there is the possibility of new jobs, training opportunities, openings for existing and new businesses. Equally the ward profiles published for the Community Impacts Consultation highlighted the opportunity to work on the project as a benefit, but very limited information was provided in the consultation which would underpin this. This was unhelpful and felt like "jam tomorrow" i.e. a pleasant event in the future, which is never likely to materialize. National Highways has now published a Skills, Education and Employment Strategy. This is included in appendix B of the Section 106 Agreements – Heads of Terms (APP-505). The document advises in section 7 that National Highways will undertake best endeavours to implement the principles and measures set out within the Skills, Education and Employment Strategy ('the SEE Strategy'). It also advises that The SEE Strategy is to be updated every two years to ensure it responds to changing needs and priorities. Commitments to the upskilling and employment of the local community are an important aspect of health, equalities, and wellbeing, as their implementation contributes towards the local economy and therefore the financial resilience of the local community. Financial security also impacts on local deprivation rates and the associated health outcomes, with poorer communities less able to access healthcare and wellbeing opportunities (such as private healthcare, exercise facilities, social care, and education regarding healthy choices).

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	The construction jobs are claimed as a major benefit, which they may be, but only if there is a proactive strategy for getting people the training necessary. As shown earlier, there are low levels of qualification attainment with both percentage qualified to NVQ4 and above; and percentage qualified to NVQ2 and above, below national levels. As a result of the amorphous nature of the offer, the Council has been asking for a skills and training hub in Gravesham to allow local people to take maximum advantage of construction job opportunities. Asks: • National Highways needs to satisfy the Council that it will ensure appropriate training is provided to enable local people within the Borough are able to access the employment opportunities. • Equally, National Highways also needs to demonstrate that measures will be put in place to develop local supply capacity and capability to maximise opportunities for local supply chain businesses
Applicant's Response	As set out within the SoCG [**REP1-100**], the Applicant shared a Skills, Employment and Education (SEE) Strategy which sets out the Project's ambition to support local labour progression, skills attainment, and pathways to sustainable employment with Gravesham Borough Council in July 2022. Some measures within that are already being implemented (where practicable) and the Applicant continues to engage with Gravesham Borough Council on the Strategy. The SEE Strategy (appended to the Section 106 Agreements [**APP-505**] includes a number of obligations on the Project and its Contractors to promote employment opportunities across all skill and qualification attainment levels including (for example) apprenticeships, and generally achieve estimates for local recruitment. The SEE Strategy (appended to the Section 106 Agreements [**APP-505**] also provides a framework to support business growth, this includes development of a supply chain with local businesses, commits the Applicant, in line with the Department of Transport's Small and Medium Enterprise Action Plan, to track spend of at least £1 in £3 of construction spend with SMEs, to use a free supplier platform to enable local businesses to compete for contract opportunities, to work closely with local authorities and the Local Enterprise Partnership to build and deliver a local supply chain.
Paragraphs 13.112, 13.114 and 13.117 Pages 112/113	**Population and Human Health (Housing and Community Related Impacts)** Given the number of workers required for the construction of the tunnel and the connecting roads and structures, and the other major projects in the area, the lack of provided accommodation for workers is a key concern for this Council. It is assumed that 35% of workers would be employed locally and therefore would not require accommodation provision. The Council considers that there is a significant risk that if the workers take accommodation in the private sector this will lessen the opportunity to prevent homelessness or housing stress to the residents in Gravesham. Workers are at an unfair advantage that they will be a working status and be able to pay fees up front. It is worth noting that the report primarily uses data from the 2011 Census – for example Table 6.3 sets out the number of PRS homes and bedrooms by the areas of each local authority within the 60-minute areas, based on 2011 Census

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	data. This is important as the number of households living in the private rented sector (PRS) has grown by 1.1 million in ten years across England and Wales i.e. they don't have the security that owner occupation gives them. Also, as has been widely reported, there has been a significant decline in the number of homes available to rent. In 2019, there were 225,000 homes listed to rent across Britain's rental market whereas the most recent data shows that this number has now declined to little more than 134,000, representing a three-year drop of 40%, or 91,000 homes. These declining numbers are represented across the whole of Britain with every single region seeing their rental markets shrink considerably. A 40% nationwide decline in available rental homes in just three years is remarkable and more than a little concerning. It means that demand is going to be incredibly high leading to a very competitive market which will inevitably lead to rising rent values which is going to add additional stress to those who are already struggling to stay afloat. Demand for PRS is already an issue in Gravesham as we will articulate in this section.
Applicant's Response	The Worker Accommodation Report [**APP-511**] considers a conservative assessment case of 35% local recruitment at peak, although recognises that the Project's SEE Strategy [**APP-505**] targets at least 45%, and that given the scale of the local labour market, a far higher local recruitment rate will be achievable. Accommodation for non-local workforce has been included within the application to the north of the river, where the peak workforce is likely to be greatest (and tunnelling and hyperbaric work will be oriented). The Applicant recognises the concern raised by Gravesham Council relating to competition for rented accommodation between non-local workers on a temporary basis and local non-working residents, but notes that: • The Project will support a substantial amount of employment accessible by some locally unemployed residents, supporting their ability to access the private rented market. • The Applicant has identified that demand from non-local workers for private rented accommodation in Gravesham would equate to 0.5% of PRS bedspaces in the borough. Gravesham Borough Council notes that 2011 Census data has been used in the assessment, which is a known limitation – subsequently released data has identified that there are now an extra c. 2,000 private rented spaces in Gravesham. Gravesham Borough Council notes that the amount of "available" (listed to rent) private rented accommodation has decreased by 40% nationally since 2019 (the same dataset explains this is 35% in south-east England). This is principally due to legislative changes on buy-to-let mortgages, coupled with national economic changes such as the increased cost of living and inflation. As a proportion of all private rented accommodation, inherently this means that an estimated 2.5% of rented stock is "available" now compared to 4.1% in 2019. Applying these penetration rates to stock in Gravesham means that an estimated c. 430 bedspaces are available in the borough (2.5% of 17,462), which would not be a substantial change locally.

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	The English Housing Survey (2023) notes that 50% of private rented households had lived in their home for less than three years (a timescale that included a long period of COVID-19 restrictions when moving was not possible), suggesting that despite low availability in terms of listing, there is still substantial churn within the market and therefore the metric of "available" accommodation is not a particularly strong indicator.
Paragraphs 13.123-13.131 **Pages 115-117**	**Population and Human Health (Housing and Community Related Impacts)** Table 13.68 'Human health assessment – construction' in chapter 13 (APP-151) advises that "The health outcome for affected communities / populations as a result of construction workforce impacts on accommodation during construction is considered to be neutral". The Council disagrees with this conclusion. No direct provision is proposed by National Highways as their strategy predicts demand, potential spare capacity and the location of demand will be distributed across a broad area. The Council does need to highlight that similar views were held for Hinkley Point C. Somerset Council has a webpage on the Hinkley accommodation strategy and housing projects[26] as, notwithstanding that view that demand would be spread and use existing capacity, EDF Energy were funding a range of interventions for Hinkley to manage the impacts of Hinkley Point C workers on the housing and rental markets in the area. The webpage includes the following statement: "However, in reality, the majority of demand has been in the Sedgemoor area, in close proximity to the main bus routes and the main site". The below is an extract from the Hinkley Point C Housing Strategy Phases 3 that was shared with National Highways in July 2022: This was produced in advance of the announcement in April 2022 that Hinkley Point C will require 3,000 more workers than first estimated, which is putting pressure on accommodation facilities i.e. 8,500 rather than 5,600 workers. Sizewell has committed to make available a housing fund to mitigate potential adverse effects on the local housing market caused by workers using accommodation that would otherwise be used by local residents, by encouraging extra capacity to be brought forward, and making more efficient use of existing capacity. Part of the housing fund is provided as a reactive contingency which the Local Authorities could draw upon to mitigate any potential effects of the construction workforce on vulnerability to housing need and homelessness. Information on tourist accommodation has been provided as part of our socio-economic background in this LIR. As highlighted in the earlier section, Gravesham has a small stock of visitor accommodation. Of the tourism enterprises in Gravesham, only 3.9% are for accommodation for visitors. Our neighbours - Medway at 2.9% and Dartford at 1.6% - are even lower, highlighting limited provision in the area.

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	The Council's Overview Scrutiny Committee were recently presented with a report that was taken to Cabinet and provided an overview of the rationale to create a not-for-profit Social Lettings Agency (SLA) in Gravesham. The Director (Housing Services) and the Service Manager (Housing Options) highlighted the following key points: • As a Local Authority, Gravesham Borough Council (GBC) has a statutory responsibility to provide temporary accommodation. • There has been a significant increase in those accessing the service, which has resulted in financial pressure with a sum of £1.8m being spent last year on temporary accommodation. • Housing Services have struggled to access the private housing sector, and have been looking at ways to reduce the impact to the Council and provide a better outcome for those in temporary accommodation. • In 2022/23, Housing Services had over 1900 presentations from households requesting a service as they are in threat of being homeless and there are over 200 households in temporary accommodation. • Private renting was increasing in cost, making it harder for residents to access. There are considerable gaps between the market rent and the local housing allowance leaving large top ups to find for households dependent on welfare benefits. • With the Renters Reform Bill, they have seen an increase in landlords leaving the market, but the SLA provides them with an option to hand their property over to be managed by the SLA and with guaranteed rent and may encourage them to continuing being a landlord. The above is very much focused on the Council's concerns about PRS but paragraph 5.8.4 of the WAR (APP-551) recognises that some staff may move to the area for a substantial length of time (potentially several years) and they may seek permanent owner-occupied housing in the area and bring their families with them. It advises that other major projects...estimated 30%, 8% and 22% respectively of workers that would relocate into the area. Balancing the fact that there is a relatively higher cost of housing in the Project area and the more transient nature of construction in the region with the growing level of construction activity, a lower percentage of 8% has been assumed for the Project. We consider that this needs to be treated with caution. Gravesham, and Gravesend in particular, has for some been identified as an attractive place to live[27]. National Highways is not currently proposing to mitigate the added pressures from these workers and their families and hence the inclusion of mitigation in our draft section 106 asks (AS-070).
Applicant's Response	The Applicant recognises the comparison between Hinkley Point C and the Lower Thames Crossing but notes that there are over 6,000 non-local workers currently living in the area around that project (of which 1925 are living in rented accommodation in the (former) Sedgemoor district). The Applicant anticipates – conservatively – that the Lower Thames Crossing's peak construction would lead to a demand for 76 private rented bedspaces within a supply in 2021

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	of 8,053 properties (or around 17,500 bedspaces). Given the substantial difference in the demand/supply ratio between these two areas/projects, the Applicant does not consider this is a reasonable comparator. The Applicant does not consider that it is clear that the figures presented by Gravesham Borough Council regarding visitor accommodation demonstrate that there is a small or constrained supply. The Local Impact Report refers to UK Business Counts data identifying 15 "accommodation for visitors" enterprises in Gravesham in 2022. Data from Visit Britain's Accommodation Stock Audit (2016) suggested that there were over 1,100 bedspaces in Gravesham borough in serviced and non-serviced tourist accommodation.
Paragraphs 13.132-13.133 **Pages 117/118**	**Population and Human Health (Housing and Community Related Impacts)** As highlighted above, the Council considers that National Highways approach to construction has the potential to be highly detrimental to the area if it is wrong on its assumptions on workers. As the Council has stated in its PADSS (AS-069): *The Council does not believe that there is sufficient capacity in the local housing market to accommodate additional demand from the construction workforce in a very constrained supply situation. Regular monitoring of workforce to see where they are living and how they are travelling so mitigation measures can be adjusted to suit.* The Council has set out a range of practical solutions to National Highways in our s.106 draft heads of agreement (AS-070) including: • Initiatives to increase the supply of bedspaces in private housing and tourist accommodation – for example, by enabling the delivery of units which otherwise would not be delivered, for example by assisting with cashflow on stalled sites. • The Council recognises that LTC does not want a housing legacy from the project and there are multiple ways that this can be avoided if they work in partnership with GBC i.e. LTC's contribution is primarily financial and GBC manages the delivery of the additional units for use by LTC workers for the construction phase but retains ownership. • Additional capacity in GBC's housing advice and homelessness prevention service and initiatives to facilitate access to PRS for local residents (such as schemes that allow people to move into private rented accommodation without having to pay a deposit) • The Council is developing a Social Housing Letting Agency to manage Private Rented Sector properties on behalf of Landlords to provide a long term, high standard, and affordable housing within the private rented sector. We are developing this it will help us break down barriers that may be experienced by some client's in accessing private rented properties and help reduce the waiting time for those waiting to be housed. LTC can provide assistance with this.

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	• initiatives to reduce impact on existing communities such as development of Article 4 for HMOs • Coordinator(s) and Accommodation Working Group • An obligation to conduct regular workforce surveys which will be shared with working group in order to provide information to the Accommodation Working Group in relation to the estimated number of home-based and non-resident workers, their use of accommodation of different types and the location of their accommodation. This will also ask information about any family members which have re-located with them i.e. children. • The Council has also asked for clarity on what arrangements LTC would put in place if they had to temporarily move people due to construction impacts i.e. noise, air quality. Could be very short-term i.e. unexploded ordnance or long-term if air-filtration equipment or triple glazing was needed to be fitted to residential properties.
Applicant's Response	The Applicant has undertaken a robust assessment of the potential effects of the Project's non-local workforce on housing market capacity and stress, and identified a number of precautionary measures to ensure the free-flow of information and engagement to monitor the workforce's location, accommodation type and scale, as set out within the Framework Construction Travel Plan [**APP-546**] at paragraphs 5.4.13 to 5.4.14. This also commits the Applicant and Contractors to '*propose further reasonably practicable measures which encourage a higher proportion of locally employed workers (thereby reducing demand for accommodation) and incentivise workers to live in areas which have higher capacity. Measures would be presented to the WAWG, and National Highways would have due regard to comments raised at that group on the measures to be undertaken*'. These commitments represent a best-practice approach towards monitoring and forward-look and stakeholder engagement, recognising the level of uncertainty caused by external factors but also that modelled effects are insignificant (and conservative). Nonetheless the Applicant will continue to consider measures suggested by Gravesham Borough Council and is grateful for the Council's pragmatic and helpful approach to suggesting interventions it considers are required. A proportionate approach will be needed to ensure that any publicly funded measures would represent value for money. Impact assessments have not identified any cases where re-housing is required in Gravesham. The REAC [**REP1-157**] outlines the following commitments as appropriate mitigation measures to be implemented during the construction phase, specifically aimed at addressing construction impacts to sensitive receptors, including residents: • NV0004: Section 61 Consents. • NV006: Noise and Vibration Assessment. • NV007: BPM.

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	• NV008: Community Engagement. • NOV009: Noise and Vibration Monitoring. • NV015: Actions in case of noise monitoring exceedance.
Paragraphs 13.136-13.137 and 13.140 Page 119	**Population and Human Health (Mental Health and Wellbeing)** In section 7 of the Code of Construction Practice (CoCP) (APP-336) is the Register of Environmental Actions and Commitments (REAC). This includes worker healthcare provision with a reference back to paragraph 13.5.33. The commitment is for the provision of healthcare services for Project construction workers by the Contractor: *The Contractor will provide an appropriate range of medical and occupational healthcare services (including on-site facilities) to meet the physical and mental health needs of the construction workforce. The range of services will be agreed with National Highways, following engagement with Integrated Care Partnerships*. This is a positive commitment albeit it does not deal with effects on the capacity of primary healthcare services to cope with impact of the construction of LTC from people other than construction workers i.e. existing residents as identified in the 3rd bullet point above. The Council does not consider that proposals for engagement and communication with local residents and communities as described in the CoCP (APP-336), although a welcomed concession, will be sufficient in managing community anxieties and uncertainties about construction activities and associated environmental effects (for example the commitment to providing information about timing of particularly noisy activities). Asks: • National Highways to more comprehensively address the negative health outcomes for communities associated with construction and operational noise impacts and mental health and wellbeing (arising from anxieties around construction activities) / quality of life, including ensuring that additional health and well-being services are funded to address these additional need • The Council has also asked that the well-being of the affected communities are monitored to see if additional interventions are needed. We have suggested that this can be simple – like the post-natal maternity checks on well-being. Such health surveillance is a means of detecting any harmful changes to someone's health, and importantly at an early stage to help identify if further corrective action is needed.
Applicant's Response	The Health and Equalities Impact Assessment (HEqIA) [**APP-539**] includes an assessment of the construction and operation of the Project on mental health and wellbeing. The assessment provides consideration of each of the four protective factors for mental health and wellbeing set out in the National Mental Health Development Unit toolkit (Cooke *et al*., 2011). These include "enhancing control" and "facilitating participation". The role of engagement and communication in relation to each of these areas is set out in Table 7.43 of the HEqIA (Impacts on Mental Health and Wellbeing During Construction), noting that the Project would provide opportunities for local residents to be involved

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	during construction through awareness-raising and information provision (as set out in ES Appendix 2.2: CoCP [**REP1-157**]), including through a Communication and Engagement Plan and through the creation of Community Liaison Groups. The Communications and Engagement Plan and dissemination of information to local communities during the construction period can play a valuable role here in reassuring people about activities that are ongoing; the helpline would provide people with an opportunity to raise any concerns they may have. In relation to the specific "Asks" made by Gravesham Council: • National Highways will make available two community funds to provide a mechanism to address some of the residual impacts of the Project. The Community Fund (South) comprises £0.63 million (£90,000 per year for seven years) and is to be administered by the Kent Community Foundation. As set out in the Section 106 Agreements – Heads of Terms document [APP-505], grants will be awarded to eligible community-led initiatives across four key themes which have been identified in consultation with the local authorities based on the impacts/opportunities arising from the development, one of which relates to mental health and wellbeing. • As noted in the Applicant's response to this matter in the SoCG with Gravesham Council (item 2.1.126), it is understood that monitoring has been an area of specific interest to stakeholders and discussed at a number of Community Impacts and Public Health Advisory Group meetings over the course of Project development. The position remains that the monitoring of health specifically or as an aggregated indicator is not proposed. Whilst it is understood that health surveillance is a valid means of detecting harmful changes to a person's health, the ability to disaggregate any change to mental health and wellbeing arising from the Project as opposed to wider lifestyle or environmental factors is questionable, and therefore not considered to be robust.
Paragraphs 13.141 **Page 120**	**Population and Human Health (Information Sharing)** Coping with major change is difficult for most people but people are more able to accept difficult changes when they feel like the understand the reasons and they have access to on-going information. The Council considers that the Silvertown Tunnel approach to monitoring and mitigation sets a good precedent. The Silvertown DCO advises that: "the monitoring and mitigation strategy" means the document of that description set out in Schedule 14 certified by the Secretary of State as the monitoring and mitigation strategy for the purposes of this Order and which in particular contains commitments in respect of— a. traffic monitoring; b. air quality monitoring; c. noise monitoring; d. socio-economic monitoring; and e. the implementation of mitigation;

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Applicant's Response	Monitoring has been an area of specific interest to stakeholders and discussed at a number of Community Impact and Public Health (CIPHAG) meetings over the course of Project development (for example, an exceedance framework and various potential approaches to health monitoring were discussed at the CIPHAG meeting in May 2021, as referenced within the Health and Equalities Impact Assessment (HEqIA). Further, more detailed information on monitoring has been included where relevant in the HEqIA, including in relation to both construction and operational phases of the Project. For construction: • *'Air quality and baseline dust monitoring during construction – Contractors shall determine the level of any dust and particulate monitoring carried out on Project construction sites by means of a risk-based approach. If required, further commitments are included in the REAC in relation to actions that would be taken in cases of air quality monitoring exceedances.' (paragraph 7.8.23(c))* • *'Noise monitoring at agreed sensitive receptors (to be defined through development of the CoCP, and Noise and Vibration Management Plan) to ensure that the mitigation measures suggested are working effectively. Monitoring would be undertaken at locations identified in consultation with the relevant Environmental Health Officers before works start.' (paragraph 7.9.32(c)) 'The REAC [within the CoCP] includes measures relating to noise and vibration monitoring during the construction phase (REAC Ref. NV009), including the identification of a framework should noise exceedances occur (REAC Ref. NV015).' (paragraph 7.9.34)* In relation to workforce accommodation, a monitoring framework is proposed to be established (and is secured by the Framework Construction Travel Plan). During operation: • Traffic impact monitoring during the operational phase of the Project would identify changes in performance on the surrounding road network. Information setting out how such a scheme would be implemented is contained in the WNIMMP. • The findings of the ES Chapter 12: Noise and Vibration, concluded that there would be some significant effects as a result of the Project. Post-construction monitoring and evaluation would therefore be undertaken for the Project as set out in DMRB LA 111 (Highways England, 2020c). However, the monitoring of health specifically or as an aggregated indicator is not proposed.
Paragraphs 13.143 **Page 121**	**Population and Human Health (Emergency Planning and Incident Control)** Gravesham Borough Council is a member of the Kent Resilience Forum and as the Council raised in its response to the Community Impacts Consultation:

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	3.19. A particular concern is what happens in times of disruption where the impacts of congestion on the A2 and incidents on the A282 are well known with rat-running and widespread congestion throughout the Borough. The Emergency Services have significant concerns over their access to incidents on the strategic network and carrying out their day-to-day business in construction and operation phases.
Applicant's Response	The Applicant recognises Gravesham Borough Council's concerns and notes that this is being addressed by the Emergency Services and Safety Partner's Steering Group (ESSP SG) under their Community Impacts Consultation response recommendation 5.7. The Applicant has demonstrated how to access incidents and access to the network can be achieved in the current design. Emergency Response Plans will be developed for the tunnel, and where applicable, national plans/procedures will be used for the open road. The ESSP SG have noted in their written representation that they welcome the inclusion of emergency access roads within the scheme, and the Applicant will continue to engage with the ESSP SG to address their outstanding concerns.
Paragraphs 14.2 – 14.3 Page 122	**Road Drainage and the Water Environment** This chapter of the ES considers the likely significant effects on local and catchment-wide water quality, surface water and groundwater resources, land drainage and flood risk. Whilst these are issues of concern to the Borough Council, it is clear from the stakeholder engagement log that the Council's direct involvement has been limited with the requisite technical engagement taking place with the Environment Agency, Southern Water Services, Kent County Council (including as Lead Local Flood Authority), North Kent Marshes Internal Drainage Board and Natural England.
Applicant's Response	The Applicant recognises that Gravesham Borough Council has issues of concern related to road drainage and the water environment. To date, these issues have been raised with the Applicant and responses provided, which are set out within the SoCG between the parties [**REP1-100**] at items 2.1.135, 2.1.136, 2.1.137, 2.1.163 (DL-1) RRN, 2.1.164 (DL-1) RRN and 2.1.165 (DL-1) RRN. These matters remain under discussion pending Gravesham Borough Council's review of the Applicant's position, and in reference to a number of application documents.
Paragraphs 14.5-14.12 Pages 122/123	**Road Drainage and the Water Environment**

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	As tunnelling below the groundwater table influences the hydraulic regime in the surrounding ground, the Council therefore have longstanding concerns about the impact of the project on the area's hydrology. These concerns increased when the ground stabilisation tunnel was added to the project. The Council notes from the stakeholder log that there have been a number of joint meetings with Natural England and EA to discuss a range of issues including: • the water balance sustaining the Thames Estuary and Marshes Ramsar site and the potential for ecological effects due to Project-induced changes in the groundwater regime. • options for the disposal of surface water runoff from the southern tunnel entrance compound. A Hydrogeological Risk Assessment to understand the baseline water balance of the Thames Estuary and Marshes Ramsar site has been undertaken (APP-458 & APP-459). The study has concluded that rainfall is the main input, with a smaller and less certain input from leakage from the Thames and Medway Canal. About 70% of the water that Southern Water Services supplies comes from groundwater (water stored underground in aquifers), with 23% abstracted from rivers and 7% comes from their reservoirs. Therefore, the EA must protect groundwater sources used to supply drinking water from pollution. They do this by defining Groundwater Source Protection Zones (SPZs) which are zones which show the level of risk to the source from contamination. A positive aspect of the project is, as noted in paragraph 14.4.69 that the Project route does not cross the inner protection zone (SPZ1) of any of the public water supply wells. We note in paragraph 14.6.4 that rainfall runoff from the southern tunnel entrance compound will be discharged to a ditch, referred to as the western ditch, in Filborough Marshes. The ditch, and wider interconnected network of watercourses, would convey the runoff to the River Thames via an existing outfall. Impacts on baseline water quality would be prevented through provision of a treatment system at the compound that would, for example, remove suspended sediments and chalk fines. The quality of the discharge would be governed by the conditions of an EA discharge consent. The water quality attribute of the ditch network is assigned high importance, and a negligible magnitude of impact is assessed, due to the provision of treatment measures as described above. The overall significance of effect is classified as temporary slight adverse, which is not significant. The ditches highlighted are part of the Thames Estuary and Marshes Ramsar ditch network. The Borough Council understand that the discharge would be subject to an environmental permit but considering the sensitive and international importance of the Ramsar ditch network, we are concerned about what happens if there is an extreme weather event as has just happened in South Korea[29]. The water will need to go somewhere, and it is clear from recent water company cases the impact that extreme weather events can have an overwhelming impact.

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	We appreciate that consideration has been given to the Thames & Medway canal. Water levels in the Thames and Medway Canal are maintained using water that is abstracted from an extraction pool on the Denton New Cut.
Applicant's Response	Discharge from the southern tunnel entrance compound would comprise of rainfall runoff. There would be no discharges generated from activities such as dewatering. The runoff is therefore expected to have a low risk of contamination, apart from the potential for high loads of chalk fines/suspended sediments. Acknowledging the sensitivity and international importance of the Ramsar ditch network, a robust treatment system is therefore secured by commitment RDWE033, designed in line with EA requirements with regard to capacity and treatment standards. It is not practicable to design such treatment systems to accommodate extreme weather events. In the very unlikely scenario of such an event happening during the construction period, the capacity of the treatment system would be exceeded. Runoff would flow according to the topography towards the north (as would happen under current/baseline conditions). The consequent risk to Ramsar ditch network water quality however would be reduced by the substantial dilution of the compound runoff.
Paragraphs 15.2-15.10 Pages 124/125	**Climate** In June 2019, this Council passed a motion pledging to make its operations net zero by 2030. More recently, in December 2021, the council adopted its Climate Change Strategy for the period 2022-2030. This is a complex area which has been a developing area of Government policy, most relevantly in this context in the proposed changes to the NPSNN. The decision making will take place in a context where there is a requirement to move towards net zero. That begs a question as whether a major new section of road should be constructed on this scale at all due to both the embedded carbon and that which will come from the project's operation (see section 3 for a discussion on the additional traffic flows). The Applicant has accepted that the project needs to move as much as possible towards being as carbon neutral as possible, with initiatives such as potential use of hydrogen as fuel for construction vehicles[30]. The Project will make the Government's commitments to addressing the climate and biodiversity crisis more challenging with total net greenhouse gas emissions of approximately 6.596 million tonnes of carbon dioxide equivalent (tCO2e). The Applicant's assessment against the Government's carbon budgets does not account for the recently announced delay in the likely start of construction and it is unclear what effects this would have on the figures presented in the Environmental Statement (Table 15.17). If these figures are not to be updated in any event as a consequence of Action Point 1 following ISH1, the Council would request that the Applicant be invited to provide this information. The Project will undermine the Government's commitments to addressing the climate and biodiversity crisis with total net greenhouse gas emissions of approximately 6.596 million tonnes of carbon dioxide equivalent (tCO2e).The Council

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	notes from the relevant representation by Friends of the Earth London that such an amount "is greater than the entire annual emissions of e.g. Cyprus, Uruguay or DRC". The London Cycling relevant representation has referenced that the Welsh government has recently reassessed major 'road building' schemes in light of modelled climate emissions from not just construction but arising changes in motor vehicle use (including applying a test of the potential impacts to the 'well-being of future generations') and they consider that the English government should do the same in general and specifically in regard to the Lower Thames Crossing. The Council notes that on 28 June 2023, the Climate Change Committee in its 2023 Progress Report to Parliament[31] advised parliament that the Welsh Government's acceptance of its independent roads review was a welcome step. Whilst the Council understand that carbon impacts are experienced at a more than local scale, given the global nature of climate change, nonetheless, the Council does have concerns regarding the impacts during the operational phase on ecological receptors and statutory and non-statutory designated sites, including nitrogen deposition resulting in degradation of habitats. The Council are concerned about the cumulative impacts of the Project, and the risk of an increase in development encroachment on protected wildlife sites and mitigation areas. The Council is not yet persuaded that the local implications have been adequately assessed.
Applicant's Response	The Applicant considers that the approaches taken to biodiversity and carbon management by the Project are aligned to the Government's strategies for biodiversity enhancement and net zero by 2050, and will improve the UK construction industry's ability to respond to these challenges, by being designated a HEqIA). The Project's compliance and alignment with legislation, policy and plans relevant to climate are presented in the ES Appendix 15.1: Climate Legislation and Policy [A**PP-480**], and the Planning Statement Appendix I: Carbon Strategy and Policy Alignment [**APP-504**]. Action Point 1 of Issue Specific Hearing 2 [**EV-023a**] requested provision of further information on the impact of the two-year rephasing on the Environmental Statement. Appendix D of the updated Environmental Statement Addendum, submitted at Deadline 2, sets out the impacts of the two-year rephasing on the climate assessment within the Environmental Statement. The economic appraisal of carbon are set out in the ComMA Appendix D: Economic Appraisal Package – Economic Appraisal Report [**APP-526**], whilst an assessment of the Project's GHG emissions in the context of the UK carbon budgets is presented in the ES Chapter 15: Climate [**APP-153**]. A full detailed methodology relating to the assessment of local effects and approach to mitigation for nitrogen deposition is included as part of the application. ES Appendix 5.6: Project Air Quality Action Plan [**APP-350**], covers the sites identified as being significantly impacted as well as the steps taken to review options for mitigation and compensation,

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	and the rationale for how the compensation strategy was developed and the final proposals. Further information is also set out within ES Chapter 8: Terrestrial Biodiversity [**APP-146**], ES Appendix 8.14: Designated Site Air Quality Assessment [**APP-403** to **APP-406**], and ES Appendix 8.22: Terrestrial Ecology Surveys at Nitrogen Deposition Compensation Sites [**APP-418**]. With reference to '*the relevant representation by Friends of the Earth London that such an amount "is greater than the entire annual emissions of e.g. Cyprus, Uruguay or DRC"*' – the Applicant notes that LTC's emissions relate to a 60 year appraisal period.
Paragraphs 16.7-16.8 Pages 126/127	**Cumulative Effects** As highlighted in the earlier information on tourism and walking and cycling networks, the Lower Thames Crossing project will impact on people's access to key locations for recreational activities i.e. the country parks and walking routes. Many of these are frequented by dog walkers. The Council is concerned that these assets being less accessible, will increase recreational visitors to the coast. This may also increase the most damaging off-lead use when key off-lead locations like Jeskyns will be less accessible. Table 16.2 of APP-154 considers the potential for intra-project effects on receptor groups from other topics. This table shows for each receptor group where other topic effects could result in potential intra-project effects (represented by a Y). It is concerning that the intra-project effects for the 'population and health' chapter on biodiversity receptors has not been considered (represented by a N), when National Highways are aware of the Council's concerns about the potential impact on the North Kent Marshes and its bird populations from changes in people's recreational offer during the construction phase but no mitigation has been proposed. Chalk Park is not a consideration as this is not delivered until the end of the construction phase.
Applicant's Response	In line with the response to the point raised in Paragraphs 8.17 to 8.12 Pages 66/67: Recreational disturbance to the North Kent Marshes is covered in paragraphs 6.2.38–6.2.39, 7.2.38–7.1.41 and 7.2.20–7.2.21 of the Habitats Regulations Assessment - Screening Report and Statement to Inform an Appropriate Assessment [**APP-487**], which concludes there would be no effect during construction or operation of the project on this European site. In summary, there is not deemed to be an impact as the areas that the dog walkers would move to are already used by dog walkers and therefore there is a level of habituation to recreational pressure and dog walking by species. An increase in numbers would cause little additional disturbance.
LIR Appendix 7a Landscape & Visual – Methodology and	Nationally recognised sources of standards and guidance have been used to inform the assessment. However, there appear to be some inconsistencies between the 2020 and 2022 versions of LTC document 6.1 Env Statement Ch 7. They each state that the assessment follows DMRB methodology (Design Manual for Roads and Bridges (DMRB) LA 107 Landscape and Visual Effects (Highways England, 2020a), but the 2020 version adds 'and relevant guidance

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assumptions. Section 7.4	including LI and NE publications' whilst the 2022 version changes this to 'also having regard to the Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3) (Landscape Institute and Institute of Environmental Management and Assessment (IEMA), 2013)' A subtle change, but the more recent version removes the need for the assessment to be guided by the GLVIA. However, GLVIA (3rd edition) is specifically referenced as guidance to assist in addressing landscape issues in para 5.144 (and footnote 102) of the National Policy Statement for National Networks (NPSNN). GBC would be concerned if the Applicant has materially departed from GLVIA guidance in its assessment and clarification is requested on this point.
Applicant's Response	It is assumed that by the "2020 version" of ES Chapter 7: Landscape and Visual, the LIR is referring to the DCO application that was withdrawn in November 2020; the version of ES Chapter 7: Landscape and Visual contained in the withdrawn DCO application was superseded by [**APP-145**], as submitted in October 2022. The Landscape and Visual Impact Assessment in the current DCO application has not departed from the Guidelines for Landscape and Visual Impact Assessment Third Edition (GLVIA3) (Landscape Institute and Institute of Environmental Management and Assessment, 2013). The introduction to ES Chapter 7: Landscape and Visual specifically states that the assessment also has regard to GLVIA3. Due to the nature of the Project, the primary guidance document followed has been DMRB LA 107 Landscape and Visual Effects (Highways England, 2020). Section 7.3 of ES Chapter 7: Landscape and Visual provides a full list of the standards and guidance documents that have been used in preparing the methodology for data collection and assessment of landscape and visual impacts.
LIR Appendix 7a Landscape & Visual – Susceptibility of LLCAs. Paragraph 7.6.5	As the KDAONB is a landscape of national importance, the Susceptibility should be 'High' or 'Very High' in line with the methodology. The applicant is requested to reconsider the ratings for Susceptibility of the LLCAs, and the reasons for changes in the assessment since 2020.
Applicant's Response	For response to comments on the assessment of susceptibility within the West Kent Downs (sub-area Cobham) Local Landscape Character Area (LLCA), reference should be made to the response provided on the assessment of landscape effects below (response to paragraph 7.7.2, and additional text in paragraphs 7.7.1, 7.7.4, 7.7.6 and 7.7.8 and in Table 7.1). The methodology for the Landscape and Visual Impact Assessment is set out in Section 7.3 of ES Chapter 7: Landscape and Visual [**APP-145**] and ES Appendix 7.2: Landscape and Visual Assessment Methodology [**APP-377**], and has been appropriately applied to assess the realistic worst case effects likely to arise from the Project. There have been several Project design changes and further development of the Project definition since the DCO application made in October 2020 was withdrawn. The current ES Chapter 7: Landscape and Visual therefore reflects these design changes and a greater level of certainty around the likely effects of the Project following further design development, in particular, relating to proposed utilities diversions along the M2/A2 corridor. Furthermore, the definition

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	of baseline landscape and visual conditions has also been critically reviewed and updated since October 2020. The ES Chapter 7: Landscape and Visual submitted with the current DCO application should therefore be read as a standalone assessment, and should not be compared to the version that was withdrawn in late 2020 and is of no relevance to the current application.
LIR Appendix 7a Landscape & Visual – LLCA boundaries. Paragraph 7.6.6	(i) The boundary between the West Kent Downs (sub-area Shorne) and West Kent Downs (sub-area Cobham) LLCAs in the documents does not accord with the boundary shown in the Kent Landscape Assessment, and Kent County Council's map records. The LVIA shows the boundary between the two sub areas to be formed by the southernmost carriageway of the A2, but the Kent CC mapping shows the east bound carriageways are in Shorne and the west bound carriageways and central reservation are in Cobham. (ii) Our response: It is considered that the position of the boundaries of these LLCAs may have an influence on their assessment of effects, as it brings much more of the proposed works into the Cobham Sub Area, and correspondingly reduces those in the Shorne Sub Area. Accordingly, we would request the applicant reviews the boundary and considers a reassessment in the light of the revision. (see also Table 7.1 West Kent Downs (Sub area Cobham) our response to the assessment - below).
Applicant's Response	As stated in ES Chapter 7: Landscape and Visual [**APP-145**], LLCA boundaries within the Kent Downs Area of Outstanding Natural Beauty (AONB) have been based on the Kent Downs AONB Landscape Character Assessment Update (Kent Downs AONB Unit, unpublished at the time of DCO application; published in January 2023) rather than The Landscape Assessment of Kent (Kent County Council, 2004). Paragraph 7.3.58 of ES Chapter 7: Landscape and Visual notes that: '*The above landscape character studies* [Kent Downs AONB Landscape Character Assessment Update, Draft (Kent Downs AONB Unit, 2020) unpublished as of 15 September 2022] *and the boundaries of character areas identified in the studies have been used to inform the definition of the LLCAs, which have been used as a basis for the assessment of effects on the landscape at the local level. In a limited number of locations, the boundaries of the published character areas have been slightly adjusted through detailed study and analysis undertaken for the LVIA in this chapter*.' This approach is consistent with best practice guidance in the Guidelines for Landscape and Visual Impact Assessment, Third Edition (Landscape Institute and Institute of Environmental Management & Assessment, April 2013), which in relation to using existing character assessments, states at paragraph 5.15 that: '*Existing assessments may need to be reviewed and interpreted to adapt them for use in LVIA… Fieldwork will also be required to check the applicability of the assessment throughout the study area and to refine it where necessary, for example, by identifying variations in character at a more detailed scale*.'

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	From our review of the West Kent Downs (sub area Cobham) LLCA and from our site visits, we are of the view that HS1 and the associated planting strongly define the northern extent of the Cobham sub area and it therefore made sense for the Shorne sub area to incorporate the whole width of the A2 corridor, beyond HS1. However, notwithstanding the slight difference in the West Kent Downs (sub area Cobham) LLCA boundary shown on ES Figure 7.2: Local Landscape Character Areas [**APP-198**] compared with the Kent Downs AONB Landscape Character Assessment, the effects of the Project are fully assessed either as direct or indirect effects within the West Kent Downs (sub area Cobham) LLCA, and/ or the neighbouring West Kent Downs (sub area Shorne) LLCA. The effects on both the West Kent Downs (sub area Cobham) LLCA and on the West Kent Downs (sub area Shorne) LLCA are assessed in Tables 2.3 and 3.3 of ES Appendix 7.9: Schedule of Landscape Effects [**APP-384**]. The findings of these two assessments are then brought together into a combined assessment for the overarching West Kent Downs Landscape Character Area (LCA) 1A, identified in the Kent Downs AONB Landscape Character Assessment Update. The combined effects reported in the landscape impact summary Tables 7.33 and 7.34 in Section 7.9 of ES Chapter 7: Landscape and Visual [**APP-145**], and the overall conclusion of the Landscape and Visual Impact Assessment, would therefore not differ if the Cobham and Shorne sub area boundary is drawn in a different location.
LIR Appendix 7a Landscape & Visual – Assessment of landscape effects. Paragraph 7.7.2 (with additional text in paragraphs 7.7.1, 7.7.4, 7.7.6 and 7.7.8 and in Table 7.1)	The applicant is requested to consider the comments set out in Table 7.1 regarding changes to assessment results. Our proposed assessment ratings follow the guidance provided in Table 3.8.1. of DMRB LA 104 regarding Significance.
Applicant's Response	As stated above, the version of ES Chapter 7: Landscape and Visual contained in the withdrawn DCO application is of no relevance to the current application. The methodology for the Landscape and Visual Impact Assessment is set out in Section 7.3 of ES Chapter 7: Landscape and Visual [**APP-145**], and ES Appendix 7.2: Landscape and Visual Assessment Methodology [**APP-377**]. The Guidelines for Landscape and Visual Impact Assessment Third Edition (Landscape Institute and Institute of Environmental Management and Assessment, 2013) state under the heading of "Professional judgement in LVIA" on page 21 that '*Professional judgement is a very important part of LVIA. While there is some scope for quantitative measurement…much of the assessment must rely on qualitative judgement, for example about what effect the*

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	introduction of a new development or land use change may have on visual amenity, or about the significance of change in the character of the landscape and whether it is positive or negative'. **Receptor sensitivity** Regarding the sensitivity of the West Kent Downs (sub area Cobham) LLCA, the retention of existing vegetation south of the HS1 corridor would ensure an effective landscape buffer was maintained between the Project and the LLCA. Therefore, the landscape would be largely shielded from construction works and the operational road and would have some ability to accommodate the Project without substantial loss to its overall integrity. Regarding the sensitivity of the Shorne and Higham Marshes LLCA, the Project would be largely underground, therefore it would have the ability to accommodate change without substantial loss. The local landscape character within the Order Limits is influenced by Milton rifle range and associated intrusive fencing, as well as the urban areas of Chalk and Gravesend. **Magnitude of effect during construction and opening year** The magnitude of effect levels stated for the West Kent Downs (sub area Cobham) LLCA in construction and opening year within ES Appendix 7.9: Schedule of Landscape Effects [**APP-384**] are based on the LLCA boundaries shown on ES Figure 7.2: Local Landscape Character Areas [**APP-198**] (refer to response above on LLCA boundaries, paragraph 7.6.6). Effects within the West Kent Downs (sub area Cobham) LLCA would be largely indirect, with the key characteristics of the landscape largely unaffected, apart from a small group of trees along the northern edge of Cobham Hall Grade II* Registered Park and Garden. Construction works within the Gravesend Southern Fringe LLCA would be focused along the existing A2 corridor, which dominates the landscape character of this LLCA. The magnitude of effect level stated for the Gravesend Southern Fringe LLCA during construction in ES Appendix 7.9: Schedule of Landscape Effects takes into account the dominance of the existing A2 corridor. In addition, the key characteristics of the landscape would remain largely unaffected, apart from the removal of some tree planting at the Gravesend East junction. **Magnitude of effect at design year** Mitigation measures proposed along the M2/A2 corridor include replacement tree and shrub planting, two green bridges at Brewers Road and Thong Lane, and ancient woodland compensation planting north of Park Pale. In addition, there would be extensive woodland planting around the M2/A2/A122 Lower Thames Crossing junction to the west of the Kent Downs AONB boundary. The magnitude of effect levels stated for the West Kent Downs (sub area Shorne) LLCA and West Kent Downs Landscape Character Area 1A in design year within ES Appendix 7.9: Schedule of Landscape Effects, take into account the prominence of the existing A2 corridor in the landscape. A moderate adverse effect has been assessed in design year, which is significant.

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	As mentioned above, effects within the West Kent Downs (sub area Cobham) LLCA would be predominantly indirect, with the key characteristics of the landscape largely restored on establishment of mitigation planting. Heights of established mitigation planting that have been assumed in the Landscape and Visual Impact Assessment at design year are stated in paragraph 7.3.92 of ES Chapter 7: Landscape and Visual. These heights are considered to be a reasonable reflection of likely growth rates over a 15-year period. The amount of woodland within the Shorne Wooded Slopes LLCA would be notably increased through the establishment of ancient woodland compensation planting and woodland habitat within the nitrogen deposition compensation sites. The heavily wooded slopes are a key characteristic of this LLCA and proposed woodland would enhance this key characteristic, therefore resulting in a moderate beneficial effect in design year.
LIR Appendix 7a Landscape & Visual – Assessment of landscape effects. Paragraph 7.7.6 (ii)	In addition, there would be impacts on cultural heritage, including an increased level of severance between the Grade II* Cobham Hall Registered Park and Garden to the south of the A2 and what was originally part of the park to the north, now largely contained within the Shorne Woods Country Park. Embedded mitigation in the form of tree and shrub planting along the transport corridor, and planting at Thong Lane south and Brewers Road green bridges will only provide partial mitigation of effects, as the increased width of the transport and infrastructure corridor will reduce the perceived relationship between the two areas of woodland that once formed part of the parkland and setting of Cobham Hall.
Applicant's Response	The Applicant acknowledges that the high-value designated Cobham Hall Grade II* Registered Park and Garden (RPG1) would be impacted by the presence of the widened A2 and realigned Thong Lane and Brewers Road bridges over the A2, which border the northern edge of the park. The reduction in vegetation along the northern edge of the park with the loss of trees from the central reservation of the A2 corridor, and the increase in the size of the existing infrastructure corridor in this location, would increase the visibility of modern infrastructure within and immediately adjacent to RPG1. Medium-value, non-designated built heritage asset Shorne Woods Country Park (1311), located partially within the Order Limits, would receive impacts from the operation of the expanded road infrastructure within its setting to the south and south-west. However, these impacts have been assessed as resulting in a permanent minor adverse magnitude and a slight adverse effect, which is assessed as not significant. This is detailed in paragraphs 6.6.270 to 6.6.272 and 6.6.283 of ES Chapter 6: Cultural Heritage [**AS-044**]. The Applicant also believes that the creation of the green bridges would create a green link between Cobham Hall Grade II* Registered Park and Garden and Shorne Woods with which the asset is historically associated.
LIR Appendix 7a Landscape & Visual – Assessment of	Further, works to the Halfpence Lane junction and local feeder road will require the loss of further areas of woodland, decreasing screening, and resulting in a more urbanised and visible transport corridor. Given the changes to the road arrangements at the Halfpence Lane junction, the applicant is requested to review the design of the roundabout junction with Brewers Road in order to improve the setting of the Grade II* Registered Park and Garden and Kent Downs AONB

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landscape effects. Paragraph 7.7.6 (iii)	at this point. This may assist in compensating for the additional impacts resulting from the increased severance effect of the A2 transport corridor and associated works.
Applicant's Response	There would be a limited loss of existing trees to facilitate the proposed modifications to the Brewers Road, Halfpence Lane and Thong Lane roundabout to accommodate the local feeder road access. Existing vegetation would be retained along the south of Brewers Road within the Kent Downs AONB and Cobham Hall Grade II* Registered Park and Garden. Furthermore, commitment LV001 within ES Appendix 2.2: CoCP [**REP1-157**] requires the detailed design of the Project to reduce the removal of trees and vegetation as far as reasonably practicable. Vegetation removed around the Brewers Road, Halfpence Lane and Thong Lane roundabout would be reinstated, with additional mitigation planting proposed to the north of the roundabout, as shown on ES Figure 2.4: Environmental Masterplan Sections 1 & 1A (1 of 10) [**APP-159**]. As noted in the visual impact assessment for Representative Viewpoint S-15 at design year within ES Appendix 7.10: Schedule of Visual Effects [**APP-385**], which is located adjacent to the Brewers Road, Halfpence Lane and Thong Lane roundabout, established mitigation planting '*would restore the screening in views towards vehicle movements and highway infrastructure along the widened A2 and the local distributor road, with slightly less of the highway corridor apparent compared to the existing view*'.
LIR Appendix 7a Landscape & Visual – Summary of landscape effects on the KDAONB. Paragraph 7.7.9 (ii)	Permanent changes to the landscape as a result of the changes to the A2 corridor and the proposed A2/LTC junction within the setting of the KDAONB; the A2 widening together with removal of key vegetation screening for the road and HS1, and the clearance of land and changes in landform comprise a number of issues in combination, and should be considered in totality for the effects/impacts and the overall landscape change which will result.
Applicant's Response	The overall effects of the Project on landscape character have been assessed for each of the affected LLCAs in ES Appendix 7.9: Schedule of Landscape Effects [**APP-384**], including, as applicable: changes to the A2 corridor; the proposed M2/A2/A122 Lower Thames Crossing junction; removal of vegetation; and changes to landform.
LIR Appendix 7a Landscape & Visual – Summary of landscape effects on the KDAONB. Paragraph 7.7.9 (iii)	Damage to the historic parkland landscape associated with Cobham Hall Grade II* listed Registered Park and Gardens on its northern perimeter resulting from the loss of the previous HS1 mitigation planting
Applicant's Response	Refer to response above on paragraph 7.7.6 (ii) for details of effects on Cobham Hall Grade II* Registered Park and Garden.

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LIR Appendix 7a Landscape & Visual – Summary of landscape effects on the KDAONB. Paragraph 7.7.9 (iv)	Replacement/mitigation planting which may be inappropriate for the setting.
Applicant Response	For response on the suitability of replacement/mitigation planting in the setting of the Kent Downs AONB, refer to responses to more detailed mitigation comments below (in relation to paragraph 7.14.4 (ii) onwards).
LIR Appendix 7a Landscape & Visual – Visual baseline. Paragraph 7.8.3	The applicant is requested to review the extent of the ZTV for the Northern Tunnel Compound operations, and to consider the extension of the ZTV to include areas south of the A2, in order that effects on the KDAONB in that area may be assessed. Also, to explain the type of operations proposed for the compounds, and the presence and heights of light sources at night.
Applicant's Response	The 5km Area of Search and therefore the extent of the Zones of Theoretical Visibility (ZTV) was agreed with stakeholders during consultation, as described in Table 7.2 and paragraph 7.3.40 of ES Chapter 7: Landscape and Visual [**APP-145**]. The northern boundary of the Kent Downs AONB would be approximately 4.7km away from the northern tunnel entrance compound. Although page 12 of ES Figure 7.8: ZTV - 5km DTM Analysis of Main Construction Compounds (1 of 2) [**APP-204**] illustrates visibility of the northern tunnel entrance compound as far south as the Kent Downs AONB, there would be few views of the compound from the AONB. Most elements within the compound would be barely apparent at that distance, and would be seen in the context of large-scale urban development at Tilbury and Tilbury Docks. Even at Representative Viewpoint S-29 from Shorne Ifield Road on the edge of the Kent Downs AONB, and therefore at the closest point from the AONB to the northern tunnel entrance compound, the tallest elements in the compound (up to 25m high) would be prominent but would not be the focus of the view due to the distance, as explained in ES Appendix 7.10: Schedule of Visual Effects [**APP-385**]. Similarly, construction lighting within the northern tunnel entrance compound would be viewed at a distance and in the context of existing lighting at Tilbury and Tilbury Docks. Existing light sources along the northern bank of the River Thames are apparent in the night-time photographs for Representative Viewpoints S-32, S-33 and S-38a in ES Figure 7.18: Representative Viewpoints - Night-time (inc. Winter) Views [**APP-243**]. In addition, construction lighting would be subject to control measures described in Section 6.8 of ES Appendix 2.2: CoCP [**REP1-157**]. Information on construction compounds is provided in ES Chapter 2: Project Description [**APP-140**].

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LIR Appendix 7a Landscape & Visual – Assessment of Visual Effects. Paragraph 7.10.1 (with additional text in paragraphs 7.11.2 to 7.11.5, 7.12.1 (iv) and in Table 7.2)	Our response to the assessment of individual visual receptors is set out in Table 7.2: LVIA: Visual Effects Assessment - Analysis and Comments.
Applicant's Response	The methodology for the landscape and visual impact assessment is set out in Section 7.3 of ES Chapter 7: Landscape and Visual [**APP-145**], and ES Appendix 7.2: Landscape and Visual Assessment Methodology [**APP-377**]. The Guidelines for Landscape and Visual Impact Assessment Third Edition (Landscape Institute and Institute of Environmental Management and Assessment, 2013) state under the heading of "Professional judgement in LVIA" on page 21, that '*Professional judgement is a very important part of LVIA. While there is some scope for quantitative measurement…much of the assessment must rely on qualitative judgement, for example about what effect the introduction of a new development or land use change may have on visual amenity, or about the significance of change in the character of the landscape and whether it is positive or negative*'. **Receptor sensitivity** Visual receptors at Representative Viewpoints S-04, S-05, S-05a, S-08, S-09, S-12, S-13, S-14, S-15 and S-17 all lie within the Kent Downs AONB, with the exception of S-17, which lies on the edge of the AONB. The sensitivity of these visual receptors has been assessed as "high", rather than "very high", in ES Appendix 7.10: Schedule of Visual Effects [**APP-385**]. This is due to the prominence of existing highway and/or rail infrastructure in the existing view, which reduces the sensitivity of visual receptors to the nature of the proposed change. The approach to this is explained in paragraph 4.3.2 of ES Appendix 7.2: Landscape and Visual Assessment Methodology. The sensitivity of visual receptors at Representative Viewpoint S-28, assessed in ES Appendix 7.10: Schedule of Visual Effects, relates to Table 3.41 of Design Manual for Roads and Bridges LA107 Landscape and Visual Effects (Highways England, 2020) where users of local/regional routes of moderate importance are considered to be of moderate sensitivity. In addition, the presence of the A2 corridor in existing views has been taken into account in the assessment. The sensitivity of visual receptors at Representative Viewpoint S-29 within ES Appendix 7.10: Schedule of Visual Effects, relates to Table 3.41 of Design Manual for Roads and Bridges LA107 Landscape and Visual Effects (Highways England, 2020) where transient views from local/regional routes are considered to be of moderate sensitivity. In addition, the proximity of the road to the Kent Downs AONB has been taken into account, resulting in a high sensitivity, rather than very high sensitivity.

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	Magnitude/significance level of effect during construction and opening year From Representative Viewpoint S-03, traffic and highway infrastructure and occasional passing trains along the A2 and HS1 corridors are apparent in existing summer and winter views, as well as industrial buildings at Harlex Haulage. There would be some vegetation removal in this area, which would increase visibility of the A2 and HS1 corridors to a degree, although some vegetation would be retained to the north of Harlex Haulage and Park Pale, and within the field between the viewpoint and Park Pale, as shown on ES Figure 7.24: Tree Removal and Retention Plan [**APP-261**]. Construction works would be noticeable within this view, but in the context of existing infrastructure. On completion of construction, the modified A2 corridor would be perceptibly more visible, with slightly less enclosure as a result of vegetation removal. The magnitude and significance levels of effect set out for construction and opening year in ES Appendix 7.10: Schedule of Visual Effects for Representative Viewpoint S-03, are therefore considered appropriate. From Representative Viewpoint S-15, views are dominated by the Brewers Road, Halfpence Lane and Thong Lane roundabout, as shown in ES Figure 7.17: Representative Viewpoints - Winter and Summer Views (2 of 8) [**APP-236**]. Construction works would be noticeable in the context of existing highway infrastructure. On completion of construction, the highway layout would not appear notably different to existing, apart from there being slightly less enclosure as a result of vegetation removal. The magnitude and significance levels of effect set out for construction and opening year in ES Appendix 7.10: Schedule of Visual Effects for Representative Viewpoint S-15, are therefore considered appropriate. From Representative Viewpoint S-24, the dominance of the M2/A2/A122 Lower Thames Crossing junction is acknowledged in ES Appendix 7.10: Schedule of Visual Effects, with a major adverse magnitude of effect assessed in opening year. In terms of the significance categories given in Table 3.8.1 of Design Manual for Roads and Bridges LA104 Environmental Assessment Methodology (Highways England, 2020) for a moderate (medium) sensitivity receptor and a major magnitude of change (effect), the higher category has been selected to reflect the prominence of the new junction in the view (large adverse). The magnitude and significance levels of effect set out for opening year in ES Appendix 7.10: Schedule of Visual Effects for Representative Viewpoint S-24, are therefore considered appropriate. From Representative Viewpoint S-28, the M2/A2/A122 Lower Thames Crossing junction would be noticeable in views, in particular the Project road southbound to A2 westbound slip road viaduct, as illustrated in the photomontage within ES Figure 7.19: Photomontages - Winter Year 1 and Summer Year 15 (2 of 4) [**APP-245**]. However, views would be maintained to the wooded skyline within Shorne Woods, and traffic along the Project route north of the junction would be largely screened within cutting. In addition, the M2/A2/A122 Lower Thames Crossing junction would be in mid-range to long-range, wide views and seen in the context of the existing A2 corridor. Only one significance category is provided in Table 3.8.1 of Design Manual for Roads and Bridges LA104 Environmental Assessment Methodology for a moderate (medium) sensitivity receptor and a moderate magnitude of change (effect). The magnitude and significance levels of

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	effect set out for opening year in ES Appendix 7.10: Schedule of Visual Effects for Representative Viewpoint S-28, are therefore considered appropriate. From Representative Viewpoint S-29, the dominance of construction works in views is acknowledged in ES Appendix 7.10: Schedule of Visual Effects, with a major adverse magnitude of effect assessed during construction. In terms of the significance categories given in Table 3.8.1 of Design Manual for Roads and Bridges LA104 Environmental Assessment Methodology for a high sensitivity receptor and a major magnitude of change (effect), the higher category has been selected to reflect the prominence of construction works (very large adverse). At opening year, much of the Project route would be screened by vegetation along Shorne Ifield Road. In addition, traffic and highway infrastructure would be largely screened within the cutting along the South Portal Approach road, although the linear cutting would be visible and the chalk substrate would be apparent along the upper edges of the cutting. The Chalk Park hilltop landform would be visible in the midground; however, distant views across the River Thames would be maintained. The magnitude and significance levels of effect set out for construction and opening year in ES Appendix 7.10: Schedule of Visual Effects for Representative Viewpoint S-29 are therefore considered appropriate. **Magnitude/significance level of effect of effect at design year** Mitigation measures proposed along the A2 corridor include replacement tree and shrub planting, two green bridges at Brewers Road and Thong Lane and ancient woodland compensation planting north of Park Pale. In addition, there would be extensive woodland planting around the M2/A2/A122 Lower Thames Crossing junction. Heights of established mitigation planting that have been assumed in the Landscape and Visual Impact Assessment at design year are stated in paragraph 7.3.92 of ES Chapter 7: Landscape and Visual. These heights are considered to be a reasonable reflection of likely growth rates over a 15-year period. The mitigating effect of proposed planting has therefore been taken into account in ES Appendix 7.10: Schedule of Visual Effects at Representative Viewpoints S-03, S-05a, S-08, S-11, S-12, S-13, S-14, S-15, S-17, S-18, S-20a, S-24 and S-28. Effects at Representative Viewpoints S-05a, S-11, S-17, S-18, S-24 have been assessed as large or moderate adverse, which is significant. Effects at Representative Viewpoint S-03 have been assessed as moderate beneficial due to the establishment of ancient woodland compensation planting, which would largely screen views towards the A2 and HS1 corridors. Proposed planting on both sides of the Brewers Road green bridge would improve the existing experience for users of the crossing at Representative Viewpoints S-12, S-13 and S-14, as the M2/A2 corridor would be less apparent when crossing the bridge.

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	The magnitude and significance levels of effect set out for design year in ES Appendix 7.10: Schedule of Visual Effects for Representative Viewpoints S-03, S-05a, S-08, S-11, S-12, S-13, S-14, S-15, S-17, S-18, S-20a, S-24 and S-28. are therefore considered appropriate.
LIR Appendix 7a Landscape & Visual – Assessment of Visual Effects. Paragraph 7.10.2	Although the effect of lighting has been included as part of the assessment, it is considered that the combined effects of lighting from various sources may have been underassessed. LTC document 6.2 Environmental Statement Figure 7.8 illustrates the extent of visibility of operations from construction compounds on the south and north sides of the River Thames. Although it is unclear what each of these operations may comprise, and whether they may be lit at night, there would be operations taking place of up to 25m in height. The document shows areas of Gravesham, including the KDAONB and a large expanse of the urban area in Gravesend, where operations would be visible from up to four construction compounds (see also Visual Baseline above) This is in addition to on-site works and accompanying lighting during the construction period, and subsequently, lighting emitting from moving vehicles after the scheme is open. Accordingly, the applicant is requested to review the assessment regarding the potential combined effects of light sources on receptors.
Applicant's Response	ES Figure 7.8: ZTV - 5km DTM Analysis of Main Construction Compounds (1 of 2) [**APP-204**] illustrates worst-case "bare earth" visibility. As noted on the figure, '*The actual extent of visibility is likely to be substantially less than shown on this figure, in particular within urban areas where with them exception of settlement edges, outward views are typically screened by existing buildings or other features*'. Information on construction compounds is provided in ES Chapter 2: Project Description [**APP-140**]. Construction lighting would be subject to control measures described in Section 6.8 of ES Appendix 2.2: CoCP [**REP1-157**]. Changes to night-time views that are likely to result from proposed lighting forming part of the DCO application, have been assessed within ES Appendix 7.10: Schedule of Visual Effects [**APP-385**], including any combined effects where lighting from more than one construction compound could be visible. For example, the Visual Impact Assessment for Representative Viewpoint S-32 during construction refers to both the southern and northern tunnel entrance compounds. Night-time effects from proposed lighting have been considered in the overall assessment of visual effects at each Representative Viewpoint and visual receptor, as stated in paragraph 7.3.18 of ES Chapter 7: Landscape and Visual [**APP-145**]. The use of operational lighting as part of the Project would be minimised where safe to do so, and operational lighting would be '*controllable, directional and as low-level as is practicable and safe*', as stated in clauses LST.02 and LST.03 of the Design Principles [**APP-516**].

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LIR Appendix 7a Landscape & Visual – Comments on LVIA overall. Paragraph 7.12.1 (vi)	For the reasons outlined above, and set out in the assessment comments tables, we agree that the overall effect will be Adverse and Significant. However, it is considered that Large Adverse and Very Large Adverse effects to the landscape will not be localised, but will extend along and beyond the A2 transport and utilities corridor and extensively through areas of Green Belt land. In addition, the effects should be considered in combination with effects to heritage assets and loss of biodiversity. Further, it is considered that a number of residual visual effects are underassessed, and the applicant is requested to review the visual assessment.
Applicant's Response	Paragraph 7.9.22 of ES Chapter 7: Landscape and Visual [**APP-145**] concludes that '*the Project would result in a combined moderate adverse significance of overall landscape and visual effect on the existing landscape and visual amenity'*. The conclusion on overall effects takes account of the extensive mitigation measures proposed, including false cuttings, new planting, green bridges and the provision of substantial new areas of landscaped open space at Chalk Park adjoining the South Portal, and Tilbury Fields adjoining the North Portal. Intra-project effects have been considered in ES Chapter 16: Cumulative Effects Assessment [**APP-154**]. For a response to comments on the assessment of visual effects, refer to response above (paragraph 7.10.1).
LIR Appendix 7a Landscape & Visual – Views from the Road Assessment – Analysis and Comments. VP 1. Paragraph 7.13.4	As the assessment and other background documents show (above), the views from the road at this location are, indeed, into woodland, which, together with the separation of carriageways provided by the wooded central reservation, provides enclosure and reduces the scale of the road, making the road a far less dominant feature of the user experience at this location. For the above reasons, we disagree with the assessment of sensitivity and of value (page 12). When comparing the existing viewpoint with that of the proposed development, the significant changes would suggest that the level of susceptibility to change of the user would be at least 'Moderate' (in accordance with guidance provided by DMRB LA 107 Table 3.41. which describes 'views from and of landscapes of regional importance' as having Moderate sensitivity; although the views in this location are to 'a designated landscape of national importance' – which would afford a sensitivity level of High). Similarly, the assessment of magnitude of change during the construction phase (page 12) hinges on the dominance of the road in the current view. The magnitude would be greater than suggested in the assessment. The view is not currently dominated by the road, as suggested in the document, but is enclosed by woodland, effectively reducing the real and perceived scale and dominance of the road. In the opening year, the document mentions at 1.6.16 the 'increased visibility of the new road infrastructure with new gantries, signs and barriers clearly seen across both carriageways, rather than the single carriageway currently visible'. This would be a very different landscape, with a far more 'urban' environment, unrelieved by the softening and enclosing effect of woodland planting.

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	Accordingly, the effect of the removal of the enclosed woodland from both sides of the road, plus the removal of existing mitigation planting from the High Speed 1 route, and the removal of the important wooded central reservation, together with construction activity relating to the road, feeder/link roads and associated utilities works, would result in a substantial change, deserving of an assessment rating of 'Moderate Adverse' during the construction phase (and not Minor Adverse as the document suggests). Having considered the above points, the overall significance of the effect of the proposed development during construction, at opening year and at design year would be greater than the 'Slight Adverse' stated in the document and should be at least 'Moderate Adverse'.
Applicant's Response	The methodology for assessing the sensitivity of users of the Project route is set out in paragraphs 1.3.7 to 1.3.15 of ES Appendix 7.13: Views from the Road Assessment [**APP-388**]. As stated in paragraph 1.3.13, although people travelling along the M2/A2 corridor would be within the Kent Downs AONB, '*the Project is unlikely to be used as a 'scenic' route*'. In addition, as set out in paragraph 1.3.14 '*views would not be a key aspect of the journey*'. An assessment of medium sensitivity for users of the Project route through the Kent Downs AONB therefore seems reasonable, given the low susceptibility of road users to the nature of proposed change. Medium sensitivity is greater than that suggested for '*users of main roads…on main arterial routes*' in Table 3.4.1 of Design Manual for Roads and Bridges LA107 Landscape and Visual Effects (Highways England, 2020), which suggests low sensitivity. Although taken from Park Pale overbridge, the baseline photograph at Representative Viewpoint S-05a within ES Figure 7.17: Representative Viewpoints - Winter and Summer Views (1 of 8) [**APP-235**] shows the type of existing views experienced by users of the A2 corridor, featuring lanes of traffic, lighting columns, gantries and road signs. The assessment of the magnitude of effect in views reported in ES Appendix 7.13: Views from the Road, therefore takes into consideration existing highway infrastructure and traffic, which dominate the views of road users travelling along the M2/A2 corridor within the Kent Downs AONB. The assessment also considers the fleeting nature of views, channelled between lanes of traffic and adjoining cutting slopes or woodland, offering little opportunity to appreciate the view. The predicted minor adverse magnitude of effect assessed in ES Appendix 7.13: Views from the Road at Viewpoint 1 is therefore considered to be appropriate, in that '*there would be a perceptible change in view but this would not alter the overall balance of features and elements that comprise the existing view*' (Table 1.1 Indicative criteria used to define magnitude and nature of visual effect).
LIR Appendix 7a Landscape & Visual – Views from the Road Assessment – Analysis	Given this scale of change, the assessment for susceptibility should be higher than that stated, thereby increasing the sensitivity assessment to at least 'Moderate'. Further, the magnitude of change should be reassessed as 'Major Adverse' for the above reasons (i.e. 'the project, or a part of it, would become the dominant feature or focal point of the view' – see DMRB LA 107 Table 3.43)

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and Comments. VP 2. Paragraph 7.13.5	Photomontage S-22 (doc 6.2 ES Figure 7.19) clearly shows the effect the changes further west of the viewpoint. Unfortunately, a photomontage from S-23 (closer to the current VP 2) was not produced, as this would have shown the extent of change to the view in this area. Overall, considering the above suggested changes in assessment values, the significance of the effect should be greater than the 'Slight Adverse' of the assessment; and at least 'Moderate Adverse'.
Applicant's Response	The methodology for assessing the sensitivity of users of the Project route is set out in paragraphs 1.3.7 to 1.3.15 of ES Appendix 7.13: Views from the Road Assessment [**APP-388**]. As stated in paragraph 1.3.14, outside of the Kent Downs AONB, '*it is not considered that the views from the road would be valued highly*'. In addition, as set out in paragraph 1.3.14, '*views would not be a key aspect of the journey*'. An assessment of low sensitivity for users of the Project route outside of the Kent Downs AONB therefore seems reasonable, given the low susceptibility of road users to the nature of the proposed change. This is in accordance with the typical low sensitivity suggested for '*users of main roads…on main arterial routes*' within Table 3.4.1 of Design Manual for Roads and Bridges LA107 Landscape and Visual Effects (Highways England, 2020). Paragraph 1.6.29 of ES Appendix 7.13 acknowledges that '*For both eastbound and westbound travellers, the views along the road would dominate*'. A slight adverse significance of effect is in accordance with Table 3.8.1 of Design Manual for Roads and Bridges LA104 Environmental Assessment Methodology (Highways England, 2020) for a low sensitivity receptor and a major magnitude of change (effect). The lower of the two significance categories within Table 3.8.1 has been selected due to the dominance of the existing road corridor on views, as shown in the Representative Viewpoint S-22 and S-23 photographs included in ES Figure 7.17: Representative Viewpoints - Winter and Summer Views (2 of 8) [**APP-236**].
LIR Appendix 7a Landscape & Visual – Views from the Road Assessment – Analysis and Comments. VP 3. Paragraph 7.13.6	The assessment assumes the opening year of the completed road to be the baseline. However, DMRB LA 104 (Highways England, 2020c) defines the baseline scenario as 'a description of the current state of the environment without implementation of the project'. The Landscape Institute's Technical Information Note 01/21 'GLVIA webinar Q&As' considers the difference between baseline reporting and assessment, and states: Baseline: analysing the site/area to describe and evaluate the existing condition. Assessment: evaluating the likely change as result of the development. GLVIA3 Para 3.15 states that 'for the landscape baseline the aim is to provide an understanding of the landscape in the area that may be affected – its constituent elements, its character and the way this varies spatially, its geographic extent, its history, which may require its own specialist study, its condition, the way the landscape is experienced, and the value attached to it'.

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	The landscape currently is open, with a golf course on the site of the proposed road development, and in an area of Green Belt, where 'openness may be one of the aesthetic and perceptual aspects of the landscape. Green Belt is a planning policy designation and compliance with policy will be addressed separately to the LVIA'. (ref GLVIA3) There is currently no road present, and therefore no road users, so this cannot be a valid - or reasonable - starting point. As there is no current 'view from the road' a better starting point would be to review the nearby Representative Viewpoints from the LVIA. The difference would then be far greater and negative.
Applicant's Response	Existing visual receptors at nearby Representative Viewpoints would be of a different type and sensitivity to future road users of the Project route on road opening. Furthermore, views experienced at existing ground levels are very different to those that would be experienced from a new road in cutting. An assessment using Representative Viewpoints as the baseline was therefore not considered appropriate for offline sections of the Project route. Paragraph 1.2.2 of ES Appendix 7.13: Views from the Road Assessment [**APP-388**], explains that this document is '*an appropriate design tool*' that is used to inform '*the development of the road design, particularly the landscape and architectural elements*'. Effects relating to the Project on the existing landscape and views have been fully assessed in ES Appendix 7.9: Schedule of Landscape Effects [**APP-384**], and ES Appendix 7.10: Schedule of Visual Effects [**APP-385**].
LIR Appendix 7a Landscape & Visual – Mitigation. Paragraph 7.14.4 (ii)	Native planting should be used wherever possible. It is unclear why non-native planting has been proposed e.g. on land to the east and north-east of the proposed south tunnel entrance. In addition, the layout of planting in this area should strive to recreate the field pattern with hedgerows to replace those lost by the scheme where possible.
Applicant's Response	Outside of the Kent Downs AONB, where it is not proposed to use non-native species, proposed planting mixes would predominantly comprise native species with a small percentage of non-native species considered where appropriate, in accordance with Clause LSP.02 Planting Strategy in the Design Principles [**APP-516**]. Clause LSP.02 states that, '*The planting species mix shall be as diverse as reasonably practicable to ensure resilience against potential future diseases. It will include native species of local provenance and will also consider the inclusion of a small percentage of non-native species, where appropriate, in response to forecasted impacts of climate change. It shall comprise only 'plant healthy' accredited stock where reasonably practicable.*' In terms of recreating the existing field pattern, Clause LSP.02 Planting Strategy of the Design Principles states that, '*The species mix and pattern shall take into account the historic landscape, underlying geology, aspect, level of disturbance/potential for remediation, and other local character features to ensure it will be suitable within its environs*'. Where possible, historic hedgerow patterns have been recreated, such as at the maintenance access track to the South Portal, which follows an historic lane.

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LIR Appendix 7a Landscape & Visual – Mitigation. Paragraphs 7.14.4 (iv) and (v)	Screen planting is a key component of the approach to embedded mitigation. Although it is understood that mitigation planting may be designed to provide similar planting to that lost, it is also to be used as a method to screen undesirable views, and as an alternative to engineered solutions. Used in this way, screen planting may appear alien in the landscape. GLVIA3 Section 4.26 Re Mitigation states: '…measures that are simply added on to a scheme as 'cosmetic' landscape works, such as screen planting designed to reduce the negative effects of an otherwise fixed scheme design, are the least desirable.'
Applicant's Response	The Project design has intended to replicate existing landscape patterns and forms, as well as avoiding mitigation planting that would draw attention to the route alignment. The Project route should be subservient to the landscape in which it passes through. Clauses LSP.02 and LSP.07 within the Design Principles [**APP-516**] state that screen planting should reflect local context and historic character. A series of other measures have been included in the design to reduce landscape and visual effects, for example, the use of false cuttings as screening as discussed in Clause LSP.09 within the Design Principles.
LIR Appendix 7a Landscape & Visual – Mitigation. Paragraphs 7.14.4 (vi) to (xi)	LTC doc 6.1 Ch 7 refers to screen planting, and states heights of planting at Design Year (15 yrs) to be: a. 4.5m to 6m in height for oak and sweet chestnut; b. 6m to 10m for other trees; c. 3m for shrubs and scrub; d. 2.5m for managed hedgerows It is considered that the project has an over-reliance on planting to provide effective screening by the Design Year (within 15 years); The stated rates of plant growth will depend on a range of factors, eg size at time of planting, density of planting, soils, maintenance and watering regime. The mitigation planting for HS1 was planted in 2004 (and is, therefore, almost 20 years old) and is a useful and local comparator. It provides far less in the way of effective screening, than is shown in the proposal's photomontages. This has wider implications, as mitigation planting has been used as a means of reducing the overall significance of effects of the proposed development in a number of areas; Eg LTC document 6.3 Appx 7.9 Schedule of Landscape Effects - Higham Arable Farmland (sub area Thong) LLCA Significance of effects (design year, Summer, operation) states: 'The significance of effect has been assessed as large rather than very large due to the establishment of mitigation planting that would help to integrate the Project into the surrounding landscape.'

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	The significance of landscape effects on other LLCAs is similarly reliant on the anticipated maturity and cover provided by mitigation planting, for example in the above document - Gravesend Southern Fringe: 'The establishment of replacement tree and shrub planting at the Gravesend East junction and an extensive new linear tree and shrub belt along the southern edge of the modified A2 corridor would aid landscape integration. The planting would soften the appearance of earthworks, highway infrastructure and moving traffic and help reduce the perceptibility of these features in the wider landscape and their influence on tranquillity.'
Applicant's Response	For responses to the effectiveness of screening by design year, refer to responses on assessment of visual effects above (in relation to paragraph 7.10.1).
LIR Appendix 7a Landscape & Visual – Mitigation. Paragraphs 7.14.6 (i) to (iii)	Sites identified to provide ancient woodland compensation should, ideally, be capable of reproducing the optimum conditions for developing species-rich (ancient) woodland, over time, and preferably with a physical link to existing ancient woodland. The areas proposed as woodland planting to provide mitigation for lost Ancient Woodland and NDep compensation are currently Grade 2 agricultural land. Notwithstanding the loss of productive agricultural land, these areas may be less than ideal in terms of landscape suitability and their level of soil nutrients. (LTC document 6.2 ES Figure 10.4 Map 2 of 6 shows areas of agricultural land and their classification) It is understood that the planting proposed for the NDep compensation sites is predominantly woodland. Planting proposals for each of the proposed compensation sites should reflect ecological and landscape requirements appropriate to the locality, and be made in close consultation with stakeholders. The areas selected may not be suitable for wholesale conversion to woodland; topography, soils and local landscape should be guiding factors. A mosaic approach, including woodland, shaw woodland, parkland, wood pasture or orchards may be more appropriate, and potentially the retention of some areas of arable or pasture use Consideration should also be given to considering the sites already identified (for ancient woodland mitigation) together with the NDep sites to provide the optimum suitability for particular planting.
Applicant's Response	A mosaic approach for nitrogen deposition compensation sites has been developed, and would be on a site-by-site basis, taking into account the local conditions. The oLEMP [**REP1-173**] provides the outline requirements for nitrogen deposition compensation sites, stating the following: '*8.28.8 a. To establish a habitats mosaic including woodland and associated habitat that is closely aligned to the type of habitats that occur in the vicinity of the new habitat creation areas and is appropriate to the site conditions.* *b. To establish habitats preferentially through natural regeneration in consultation with stakeholders on appropriateness of this technique on a site by site basis.*

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	c. To establish the habitats whilst: i. avoiding significant effects on other receptors ii. taking opportunities to enhance public access and landscape'. Each site also has specific management requirements in the oLEMP [**APP-490**] with objectives to consider landscape and existing conditions, as well as providing habitat mosaics most appropriate to the site. The percentage of woodland in nitrogen deposition compensation sites is expected to be approximately 70% across the Project, but this would vary on a site-by-site basis in relation to what is appropriate for that site, as developed in consultation with stakeholders.
LIR Appendix 7a Landscape & Visual – Mitigation. Paragraphs 7.14.6 (iv) to (vii)	The need for a comprehensive mitigation strategy: Mitigation should not disrupt or change the character of the landscape. The development of a mitigation strategy would provide the strategic context for restoration of the landscape as well as providing opportunities for wider landscape improvements. A Mitigation Strategy (which may extend beyond the scope of works associated with the road scheme) could:- a. take a strategic approach to the whole landscape to be affected and the wider impacts; b. be in place to take short, medium and long-term actions forward as necessary over the life of the scheme and beyond, and develop alongside the road design; c. help to address the severance of the protected landscape; d. address the loss of local amenity use to adjoining populations; e. address the severance and diversion of access routes, and the qualitative impacts on users (receptors); f. target areas that will help reconnect and strengthen habitats, the setting of heritage features and enhance landscape character; g. maintain and enhance long views and local views; to include long views to and across the Thames and from the Kent Downs; h. make links with other topics affected by this proposal, including biodiversity, cultural heritage, and public access; i. examine the remaining open space, cultural, environmental and access assets, and propose new, coherent networks that will make a positive contribution to the Green Network; j. Support the investment needed for infrastructure in the Green Network; k. contribute to modal shift and promote sustainable transport in the area; l. address the needs of cyclists and pedestrians; m. have the potential to address local deficits of open space and recreational facilities identified by Gravesham Borough Council.

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Applicant's Response	A regional strategy was developed for the Project at a broad scale for the area south of the River Thames, with a strategic approach to the whole landscape. This is described in the Project Design Report Part D: General Design South of the River [**APP-509**].
LIR Appendix 7a Landscape & Visual – Green bridges. Paragraphs 7.15.3 (i) to (viii) (with additional text in paragraphs 7.15.1 (xiii), 7.16.3.3 (iv a, b and c))	In summary: The inclusion of green bridges into the LTC scheme is to be welcomed, but the design of those across the widened A2 should be enhanced. The provision of green bridges to improve connectivity is to be welcomed. However, the experience could be improved by better design. The proposal will result in large-scale severance of the landscape along its route. A number of public rights of way and other paths will be either extinguished or diverted, and the experience for users of paths and open spaces will be diminished as a result of the visual intrusion and/or increased noise from traffic on the proposed roads. The existing severance of the KDAONB along the A2/M2 will be increased, making this a significantly more difficult and hostile environment for wildlife and people. The design principles/management requirements (in the oLEMP and Design Principles document) should go further to ensure that the value and benefits of all three proposed green bridges are maximised. All proposed green bridges should at least meet the recommended standards in the L.I./N.E. Guidance. Given the impacts along the A2/M2 corridor and to the KDAONB and its setting, the proposed green bridges over the A2/M2 should: i. Be exemplars, of the highest quality, in design and construction; ii. iProvide a key role in helping to reduce the real and apparent severance of the KDAONB; iii. Provide essential mitigation to help reduce the real and apparent landscape and visual impacts of the A2/LTC junction; iv. Perform the role of gateways into the KDAONB; v. Be considered as Project Enhanced Structures; All proposed green bridges should provide: i. Functioning ecological corridors; ii. Landscape connections; iii. Safe and welcoming environments for recreational users (walkers, cyclists and horse-riders) in this much-visited landscape. This to include wide areas of planting at both sides of the green bridges;

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	iv. The applicant be requested to consider further options to enhance the design of the green bridges over the widened A2 to meet the requirements set out above, for recreational users crossing the Brewers Road and Thong Lane South green bridges.
Applicant's Response	The design of green bridges proposed as part of the Project is reported in Project Design Report, Part D: General Design South of the River [**APP-509**]. All three green bridges within Kent are maintaining road connections that already exist in those locations to avoid severance impacts as a result of the Project. In respect of the green bridges at Brewers Road and Thong Lane south, these would provide new habitat connections where they are currently absent due to the existing transport corridor of the A2, as well as helping to reduce the perception of separation in the landscape between the northern and southern parts of the Kent Downs AONB as a result of the road and rail corridors. The provision of green bridges is a benefit resulting from the Project, and is reported in ES Chapter 8: Terrestrial Biodiversity [**APP-146**] at paragraph 8.5.8; ES Appendix 7.9: Schedule of Landscape Effects [**APP-384**]; ES Appendix 7.10: Schedule of Visual Effects [**APP-385**]; and in the oLEMP [**REP1-173**] at paragraph 5.6.6. The specific design principles for green bridges are reported in the Design Principles [**APP-516**]. Clause STR.08 states that planting should tie in with the broader landscape to ensure connectivity, as well as enhancing the user experience. Clause S1.04 states that the detailed design of the bridges would provide connectivity of habitats, strengthen the wooded character, and act as local landmarks signalling entry into the Kent Downs AONB. Clause S2.04 states that Thong Lane North green bridge would be designed to extend the character of the well-vegetated Thong Lane, and to connect woodland to the east and west to provide a habitat corridor for mammals. The Applicant has considered the Landscape Institute and Natural England guidance on green bridges (Green Bridges, Technical Guidance Note 09/2015 (Landscape Institute, 2015) and Green Bridges, A Literature Review (Natural England, 2015)), which state: '*To determine the width, the minimum width of the natural zone should be calculated, based on the project aims in terms of target species*'. The design of the Brewers Road and Thong Lane south green bridges are appropriate to the target habitat connections, in this case dormice and small mammals. Added onto this width are the walking, cycling and horse riding routes and the road network, plus additional screen planting and hedgerows. The Applicant considers the width of the green bridges is appropriate, particularly when considering the construction constraints of building a bridge over a live strategic network. Furthermore, in discussion with Natural England, an opportunity has been identified to enhance the user experience of Brewers Road green bridge and Thong Lane green bridge south, through the detail distribution and design of the environmental mitigation areas on both bridges. To make provision for the enhanced design and provide greater certainty on delivery, it is proposed to supplement the existing Clause S1.04 and delete existing Clause S1.17 of the Design Principles. The amended principles will be submitted into Examination when the Design Principles are next updated.

LIR Reference	Local Impact Report Extract / Applicant's Response
LIR Appendix 7a Landscape & Visual – Widened A2 road corridor: Our comments. Paragraphs 7.15.5 (i) to (iv)	The proposed A2 corridor would cut a wide swathe through the KDAONB between the A2/M2 junction in the east and the new A2/A122 junction in the west. The expanse of up to 16 lanes of traffic and hard surfacing, would be unrelieved by the softening effect of vegetation. The landscape and visual impact of the proposed road corridor would be magnified by the loss of the important wooded central reservation, which currently helps reduce the effect of the road in this part of the KDAONB, and emphasises the sense of enclosure. The loss of the wooded central reservation appears to be understated in the LVIA, and its contribution to the landscape and visual amenity undervalued. It is a key component of the landscape in this area. This largely wooded strip is understood to be a remnant of the Cobham landscape woodland to the south, which was cut-off from the woodland to the south by the early widening of the A2. In addition, in order to accommodate the width of the widened A2 and its link roads, existing woodland planting on both the north and south sides of the A2 would be removed together with screening vegetation along the northern boundary of HS1. This would result in a significant increase in real and perceived severance of the KDAONB between Cobham Hall Registered Park and Garden and Shorne Woods Country Park, and the introduction of a new level of urbanisation to this corridor. The urbanising effect would be increased by gantries and other structures of a far greater scale and mass than are currently found, and would result in a permanent change to landscape character. The proposal documents suggest that the effects of the project would be contained by surrounding woodland. However, it would not be possible for adjacent woodland to contain the scale and mass of the project and the significantly increased width of unrelieved hard surfacing. The retention of open areas for utilities will exacerbate the apparent width and visibility of the road. Even at maturity, the proposed mitigation planting would not be able to reinstate the landscape character.
Applicant's Response	Landscape and visual effects associated with the M2/A2 widening are assessed in ES Appendix 7.9: Schedule of Landscape Effects [**APP-384**], and ES Appendix 7.10: Schedule of Visual Effects [**APP-385**]. This includes effects associated with the loss of existing vegetation. For example, the visual impact assessment for Representative Viewpoint S-05 during construction makes reference to '*Substantial mature vegetation loss within the central reservation and adjacent to the westbound carriageway associated with the widening and realignment works along the A2 corridor, as well as some vegetation removal along the eastbound carriageway…'* The landscape and visual impact assessment acknowledges the permanent loss of vegetation along the M2/A2 corridor. For example, ES Appendix 7.9 discusses landscape character effects on the West Kent Downs (sub area Shorne) LLCA during design year, referencing the '*permanent loss of trees and woodland, including within the former central reservation*' and the '*continued perceived increase in the prominence and scale of the A2 corridor along the southern margin of the LLCA*'. Effects have been assessed as moderate adverse and therefore significant.

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	With regard to severance of the Kent Downs AONB by the M2/A2 corridor, the increased perception of separation between the northern and southern parts of the AONB would be most apparent during construction, largely due to vegetation clearance in conjunction with construction activity. However, by the design year effects would be substantially reduced due to the establishment of replacement planting along the M2/A2 corridor and adjacent ancient woodland compensation planting. In addition, the perception of increased separation would only be apparent from a limited number of locations, close to the existing M2/A2 corridor, where the existing M2/A2 corridor already gives rise to a perception of separation. The two proposed green bridges (Brewers Road green bridge and Thong Lane green bridge south) would also help to reduce the effect of physical and visual separation, by creating new broad green links connecting the northern and southern parts of the Kent Downs AONB. Retained mature woodland on both sides of the widened M2/A2 corridor (in Shorne Woods Country Park and Brewers Wood to the north; and in Cobham Hall Registered Park and Garden and Ashenbank Wood, as well as young woodland in Jeskyns Community Woodland, to the south of HS1) would provide effective visual enclosure of the Project from the surrounding landscape, thereby limiting most landscape and visual effects to the immediate road corridor. Mitigation planting to replace vegetation removed during construction along the M2/A2 corridor has had regard to the minimum offsets to each retained and diverted utility required by the relevant Statutory Undertaker and/or Network Operator. Minimum offsets are required to avoid future tree root damage to utility assets and to allow for future maintenance access. However, a mix of intermittent trees and shrubs has been proposed over the top of utility corridors to soften the alignments where practicable, with the intention at detailed design to locate trees and larger shrubs in accordance with required offsets.
LIR Appendix 7a Landscape & Visual – Junction of the A2 and the A122: Our comments. Paragraph 7.15.6 (i)	The widened A2 corridor would continue to the west where, just beyond the boundary of the KDAONB, it would be punctuated by the proposed A2/A122 road junction. The impact of the proposed junction has been difficult to interpret, as there has been a lack of visual imagery provided. However, it is clear that the junction would introduce a number of levels of carriageway, in cuttings and flyovers, and would introduce significant new urbanising elements into the setting of the KDAONB. This is of particular concern when considered together with the increase in severance of the KDAONB, with its increased urbanisation and opening-up of the landscape along the A2 transport corridor.
Applicant's Response	A preliminary selection of landscape cross-sections have been shared with Gravesham Borough Council (via email on 12 May 2023), showing the scale of the M2/A2/A122 Lower Thames Crossing junction in the landscape. A further series of landscape cross sections showing the size, height and mass of the M2/A2/A122 Lower Thames Crossing junction and associated road infrastructure will be submitted at Deadline 2, in conjunction with engineering cross sections requested by the Examining Authority. Other visual images illustrating the M2/A2/A122 Lower Thames Crossing junction is provided in Section 5 of the Project Design Report Part D: General Design South of the River [**APP-509**]; photomontage S-22 in ES Figure 7.19:

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	Photomontages - Winter Year 1 and Summer Year 15 (1 of 4) [**APP-244**]; and in photomontages S-25 and S-28 in ES Figure 7.19: Photomontages - Winter Year 1 and Summer Year 15 (2 of 4) [**APP-245**]. Landscape and visual effects associated with the M2/A2/A122 Lower Thames Crossing junction on the setting of the Kent Downs AONB are assessed in ES Appendix 7.9: Schedule of Landscape Effects [**APP-384**], and ES Appendix 7.10: Schedule of Visual Effects [**APP-385**]. Effects would be most apparent during construction, due to vegetation clearance and construction of the large-scale M2/A2/A122 Lower Thames Crossing junction. However, by the design year, these effects would be substantially reduced due to the establishment of extensive woodland planting at the proposed junction, which would be in keeping with the adjoining wooded character of the AONB. There would be few locations within the AONB where the new junction would be visible. As all but the very eastern edge of the M2/A2/A122 Lower Thames Crossing junction lies outside the Kent Downs AONB, the issue of severance (discussed in relation to the above paragraphs 7.15.5 (i) to (iv)) does not apply.
LIR Appendix 7a Landscape & Visual – Park Pale area: Our comments. Paragraphs 7.15.7 (ii) and (iii)	This area is of particular concern due to the number of individual activities proposed, and likely changes to the area as a result. These include: • The proposed access route around the northern boundary of the Harlex compound, including access arrangements to Harlex. These changes would result in encroachment into a currently undeveloped part of the AONB which has high landscape character and value, resulting in urbanising effects to the AONB; • The proposed attenuation basin (works) and maintenance access to the east of the Harlex compound; • Utilities works along the A2/M2, ULW16 and gas main works; • The removal of trees and (screening) vegetation from areas north of the Harlex area, from both sides of the existing A2, from the central reservation of the A2, from across the transport corridor and its link roads with the Wainscott Bypass, and from HS1; • Widened roadways, and increased number of lanes, unrelieved by planting; • Greater visibility of HS1 in the medium-term All the above will exacerbate the severance of the KDAONB and introducing a significantly more urban character to this area (of the KDAONB)
Applicant's Response	Landscape and visual effects associated with the Project in the Park Pale area are assessed in ES Appendix 7.9: Schedule of Landscape Effects [**APP-384**], and ES Appendix 7.10: Schedule of Visual Effects [**APP-385**]. ES Appendix 7.9 discusses landscape character effects on the West Kent Downs (sub area Shorne) LLCA in the Park Pale area, including those in relation to vegetation loss, M2/A2 widening works, the attenuation pond and proposed

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	utilities. ES Appendix 7.10 discusses visual effects in the Park Pale area at Representative Viewpoints S-03, S-04, S-05 and S-05a. The baseline view descriptions for Representative Viewpoints S-03, S-04, S-05 and S-05a within ES Appendix 7.7: Representative Viewpoint and Visual Receptor Baseline Descriptions and Visual Sensitivity [**APP-382**] note existing visibility of the A2 corridor and, where applicable, the HS1 corridor. The baseline photo at Representative Viewpoint S-03 within ES Figure 7.17: Representative Viewpoints - Winter and Summer Views (1 of 8) [**APP-235**] shows existing visibility of the A2 and HS1 corridors and buildings at Harlex Haulage. The M2/A2 widening works would take place along the existing road corridor, and the new attenuation pond and access tracks would be seen in the context of existing buildings at Harlex Haulage and/or the slip road at M2 junction 1. In the opening year, vegetation removal in this area would increase visibility of the A2 and HS1 corridors to a degree. However, vegetation would be retained to the north of Harlex Haulage and Park Pale, within the field north of Park Pale, at Brewers Wood, south of the HS1 corridor, and at M2 junction 1, as shown on ES Figure 7.24: Tree Removal and Retention Plan [**APP-261**], thereby helping to soften the appearance of the widened M2/A2 corridor, new and replacement highway infrastructure, the attenuation pond, and access tracks from within the surrounding landscape. By the design year, established roadside tree and shrub belts and extensive areas of ancient woodland compensation planting would result in the widened M2/A2 corridor, new and replacement highway infrastructure, the attenuation pond and access tracks being largely screened from within the surrounding landscape. Refer to response above to paragraphs 7.15.5 (i) to (iv) regarding severance within the Kent Downs AONB.
LIR Appendix 7a Landscape & Visual – Park Pale area: Our comments. Paragraph 7.15.7 (iv) (with additional text in paragraph 7.15.4)	The extensive works and disruption to this area will change the landscape and the visual amenity of the area. As a result the experience for recreational users crossing the Park Pale bridge across the widened A2 road corridor will be very unpleasant, even after the completion of the project. However, the bridge provides a useful link across the KDAONB to areas of countryside beyond. Document 7.4 Project Design Report Part E Page 13 provides an aerial image of the proposed access routes in the Park Pale area, and shows the bridge to be important to the access network. The LTC scheme could provide opportunities to improve the experience for recreational users of the KDAONB by developing Park Pale overbridge into a green bridge. This would provide habitat connectivity and enhance the experience of recreational users crossing the A2. It would help to screen views of the Project but retain long views to the north and east. The overbridge connects a public Right of Way from the higher slopes of the Kent Downs to the north of the bridge, across the A2 and under an existing tunnel beneath HS2. It is understood there are technical issues preventing the Brewers Road Green Bridge from being developed into a more substantial – and better functioning – landscape and ecological corridor. As a result the functionality of that bridge is limited, as is its role in acting as a gateway into the KDAONB. But the addition of a green bridge at Park Pale would provide improved ecological, landscape and recreational connectivity across the widened A2.

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Applicant's Response	The Applicant does not consider that there is a robust justification to deliver a green bridge at Park Pale. Furthermore, there is extensive replacement tree and shrub planting and ancient woodland compensation planting proposed in the Park Pale area to help reduce the landscape and visual effects associated with the Project.
LIR Appendix 7a Landscape & Visual – Area east of Thong Village. Paragraph 7.15.8 (iii)	The open character of the site should be conserved, allowing for a gradation of woodland from the boundary formed by Shorne Woods Country Park to scrub and grassland, retaining an open aspect closer to Thong Village. The proposed Open mosaic habitat would retain the open character of this site, but may not be the optimal use for former agricultural land and should not result in the introduction of PFA (pulverised fuel ash), as listed in the proposals (LTC document 6.7 oLEMP 8.22.5 and 8.22.7d). In addition, ecological ponds should be sited at the base of slopes, where they will appear more natural in the landscape.
Applicant's Response	The open character of the site east of Thong village would be conserved in accordance with Clause S2.01 Wooded circle around Thong in the Design Principles [**APP-516**]. The oLEMP [**REP1-173**] contains broad outline requirements for all areas of open mosaic habitat, which can include the use of inert material such as Pulverised Fuel Ash. However, each site of open mosaic would be subject to detailed design and be informed by the material available to create the habitat required. The ecological ponds are shown on ES Figure 2.4: Environmental Masterplan Section 2 (2 of 10) [**APP-160**] as an indicative symbol only. The design of the ecological ponds would be subject to detailed design and would be located and sized appropriately within the land parcel identified, subject to local site condition and appropriateness within the landscape. The Applicant is developing a process for the development of the detailed design (including the consultation process within it) to ensure that the measures proposed and secured in the DCO would deliver the required objectives. The Applicant has engaged with, and will continue to engage with, relevant stakeholders in developing that process. The detailed design process would be a consistent and accessible process and include documentation for all environmental designs. The detailed design process would be phased to develop a framework of consistent principles to design within across the Project; consider options and make decisions on outcomes and success criteria for each key site; and develop detailed prescription to achieve the objectives.
LIR Appendix 7a Landscape & Visual – Chalk Park and the Southern Tunnel Portal. Paragraph 7.15.9 (vi, a)	The benefits of this area for local people as an amenity resource are to be welcomed. However, the local authority and other stakeholders should be closely involved, to ensure that the open space provision is meeting local needs and/or deficiencies, and to inform the design of the park and its facilities.

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Applicant's Response	As noted in paragraph 4.1.13 of the oLEMP [**REP1-173**], local planning authorities such as Gravesham Borough Council would be part of the advisory group for development of the LEMP. In addition, Gravesham Borough Council are listed in Table 2.1 of the oLEMP and would therefore be consulted on the detailed LEMP, which would include details of hard and soft landscaping works, as stated in Requirement 5 of the draft DCO [**REP1-042**].
LIR Appendix 7a Landscape & Visual – Chalk Park and the Southern Tunnel Portal. Paragraph 7.15.9 (vi, b)	It is understood that the wooded hilltop will be 13m to 17m above the existing ground level. The purpose of this feature is not clear. The hilltop would appear alien in this gently undulating landscape, and would interrupt long views across the open landscape.
Applicant's Response	The proposed wooded hilltop landform at Chalk Park would provide a variety of mitigation functions, one of which is to help integrate the infrastructure of the South Portal into the surrounding landscape. It does this by utilising the excavated material from the South Portal approach road to replicate the character of the wooded hilltops in a manner characteristic of the nearby settlements of Thong and Shorne. The wooded hilltop landform would also provide elevated views of the Thames Estuary and surrounding landscape. This is reflected in Clause S3.04 of the Design Principles [**APP-516**].
LIR Appendix 7a Landscape & Visual – Chalk Park and the Southern Tunnel Portal. Paragraph 7.15.9 (vi, c)	The infiltration basins are engineered structures, and it is considered that they are unlikely to look 'naturalistic' in the open landscape.
Applicant's Response	Infiltration basins and retention ponds are subject to detailed design and Clause LSP.17 within the Design Principles [**APP-516**]. Clause LSP.17 states that: '*Infiltration basins and retention ponds shall not appear utilitarian or urban and shall be designed to appear as naturalistic elements within the wider setting, that take account of existing topography, gradients and field boundaries. Planting shall be provided to soften edges where this is appropriate to the context.* *The drainage design shall incorporate Sustainable Drainage Systems (SuDS) that provide for runoff treatment and reduce the risk of flooding in local catchments by providing storage and attenuation. Attenuation features are shown on the Environmental Masterplan (6.2, Figure 2.4) and the Works Plans (2.6). Where this attenuation is provided via retention and infiltration basins, the basins shall be designed to appear as naturalistic elements within the wider setting,*

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	with planting provided to soften edges where this is appropriate. Conveyance of runoff would be by means of drainage ditches and pipes, and drainage ditches would be used wherever practicable'.
LIR Appendix 7a Landscape & Visual – Photomontages. Paragraph 7.16.1 (i)	The photomontages provided to support the LVIA are useful in conveying the likely appearance of the landscape after the proposal is developed, at Operation and at Design Year (15 years after opening) However, there are a number of areas where photomontages are missing, and are needed to help illustrate the changes to the landscape and to visual amenity that will arise as a result of the proposal. Notably photomontages are needed from: d. Viewpoints that will show the proposed junction of the A2 and A122. Photomontages taken from the new Thong Lane South Green Bridge looking west for example, would illustrate the different ground levels, flyover carriageways, and the height and mass of retaining walls and other infrastructure associated with the new junction and its linking roads. b. The area just north of Park Pale (at RVP S-03) on elevated ground on footpath NS161, looking south, would help visualise the potential effects of the proposal at all stages, and the effect of Ancient Woodland mitigation planting on important views. c. RVP S-08 to better understand the 'slight adverse' effect identified at Design Year, including the effects of removing vegetation between the existing A2 and HS1; d. RVP S-23 to show the extent of change to the view in this area which will help in appraising the LVIA and the View from the Road Assessment.
Applicant's Response	Photomontage locations were agreed with Gravesham Borough Council on a joint site walk over on 19 June 2019, as stated in Table 7.2 of ES Chapter 7: Landscape and Visual [**APP-145**]. M2/A2/A122 Lower Thames Crossing junction – The location of the new Thong Lane green bridge south would be slightly further west of the existing Thong Lane overbridge and with a different orientation crossing the M2/A2. Baseline photography could therefore not be obtained to portray potential views towards the M2/A2/A122 Lower Thames Crossing junction from the new Thong Lane green bridge south. Representative Viewpoint S-03 – On completion of construction, the modified A2 corridor would be perceptibly more visible from Representative Viewpoint S-03, with slightly less enclosure as a result of vegetation removal. As views from this location were not anticipated to be notably different to existing, it was considered that a photomontage view from the nearby Park Pale bridge would more effectively illustrate the change in views along the A2 corridor. Effects at Representative Viewpoint S-03 have been assessed as beneficial at design year due to established ancient woodland compensation planting shown on ES Figure 2.4: Environmental Masterplan Sections 1 & 1A (1 of 10) [**APP-159**], with existing views towards the Darnley Mausoleum secured through Clause S1.08 of the Design Principles [**APP-516**].

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	Representative Viewpoint S-08 – The existing visibility of the A2 and HS1 corridors is shown in the baseline photograph for Representative Viewpoint S-08 within ES Figure 7.17: Representative Viewpoints - Winter and Summer Views (1 of 8) [**APP-235**]. The existing A2 and HS1 corridors are only visible from a short break in the existing vegetation along the north side of footpath NS179. On establishment of mitigation planting, the view at design year is not anticipated to be notably different to existing, apart from an increased perceptibility of highway infrastructure and the tops of high-sided vehicles. It is therefore considered that a photomontage view is not necessary from this location. Representative Viewpoint S-23 – National Cycle Network route 177 would be permanently closed at Representative Viewpoint S-23. Publicly accessible views from this location would therefore not exist once construction for the Project begins.
LIR Appendix 7a Landscape & Visual – Other visual information. Paragraph 7.16.2 (iii) (with additional text in paragraphs 7.15.6 (ii) to (iv))	Improved visual imagery has been requested previously, in particular, 3D modelling, but to date the visual imagery provided has failed to adequately convey the proposals in sufficient detail and in appropriate context, such that the effects of the proposal can be understood and assessed. The structures, elevated carriageways and cuttings proposed for the A2/A122 junction are a particular concern, as are the structures along the widened A2 at Park Pale and where the A2 meets Thong Lane.
Applicant's Response	Detailed 3D fly-through visualisations of the entire Project route, including the M2/A2/A122 Lower Thames Crossing junction have been made available for public consultations and during the DCO pre-examination stage. These fly-through visualisations illustrate the design of the A122 Lower Thames Crossing project, 15 years after road opening, and are accessible on the Applicant's website and public YouTube channel. Refer also to response above to paragraph 7.15.6 (i) regarding visual imagery. Cross-sections of the A2/M2/LTC junction were provided to Gravesham Borough Council on 15 May 2023.

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