

Lower Thames Crossing

9.83 Post-event submissions, including written submission of oral comments, for ISH3

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1 Introduction

Please note: this document contains the Applicant’s oral summary of evidence and post-hearing comments on submissions made by others at Issue Specific Hearing 3 held on 5 September 2023.

Where the comment is a post-hearing comment submitted by National Highways, this is indicated. This document uses the headings for each item in the agenda published for Issue Specific Hearing 3 [[EV-041](#)] on the 18 August 2023 by the Examining Authority.

1.1 Welcome, introductions, arrangements for the hearings

- 1.1.1 National Highways (the Applicant), which is promoting the A122 Lower Thames Crossing (the Project), was represented at Issue Specific Hearing 3 (ISH3) by Andrew Tait KC (AT).
- 1.1.2 The following persons were also introduced to the Examining Authority (ExA):
 - a. Tom Henderson, BDB Pitmans LLP, Partner (TH)
 - b. Gary Hodge, Lower Thames Crossing, Highways Technical Lead (GH)
 - c. Steve Roberts, Lower Thames Crossing, Design and Engineering Director (SR)
 - d. Clare Donnelly, Lower Thames Crossing, Project Architect and Design Advisor (CD)
 - e. Andrew Kay, Lower Thames Crossing, Lead Landscape Designer (AK)
 - f. Tim Wright, Lower Thames Crossing, Head of Consents (TW)
 - g. Barney Forrest, Lower Thames Crossing, Environment Lead (BF)

2 Purpose of the Issue Specific Hearing

2.1.1 The Applicant did not make any submissions under this agenda item.

3 ExA Questions on: A2/M2/LTC Intersection

3.1 Item 3(a) Review of function and traffic movements

Item 3(a)(i)

Item 3(a)(i): the ExA will ask the Applicant to explain the function of the proposed junction and the route paths though it that can be taken by traffic.

- 3.1.1 AT noted that GH would be dealing with the review of function and traffic movement at the intersections, and so would be speaking to the material submitted pursuant to Procedural Decision 37.
- 3.1.2 **[Post Hearing Note:** The visual representations in response to Procedural Decision 37 were uploaded to the Examination Library: Visual Representation of A2/M2/LTC Intersection for ISH3 [\[AS-145\]](#), Visual Representation of A13/A1089/LTC Intersection for ISH3 [\[AS-146\]](#), Visual Representation of M25/LTC Intersection for ISH3 [\[AS-147\]](#). Note: These visual representations will be re-submitted at Deadline 4 to correct a small number of errata.]
- 3.1.3 GH, with reference to the Visual Representations [\[AS-145\]](#), outlined the functionality and route paths for the M2/A2/A122 Lower Thames Crossing junction. GH noted that this presentation is in two sections: first an overview of the functionality, and then traffic movements. GH detailed three connection types – strategic, major and local – and that the connection type, existing routes and new routes have been demarcated as outlined in the key in Visual Representation of A2/M2/LTC Intersection for ISH3 [\[AS-145\]](#).
- 3.1.4 **Function:** GH began by outlining the strategic connections, demonstrating the connection from the M2 westbound as it travels through the existing A2/M2 corridor and joins the A122 northbound, followed by the A122 southbound going through the existing A2/M2 corridor to the M2 eastbound. There are then two connections on the west side of the junction which connect to the A2. GH clarified that those movements are not priority movements as they go to and from the A2 towards London from the A122. GH then clarified in response to a question from the ExA that the described representation is summarising a smaller traffic movement anticipated, as the key movement through the new junction is from the A122 down through to the M2.
- 3.1.5 GH explained that there will still be the existing connections on the A2 towards and from London, plus the new southbound connection from the A122, and northbound connection to the A122, from the A2 on the east.
- 3.1.6 The ExA queried whether it is the Applicant's view that the nature and the volume of traffic moving, southbound from the A122 to M2 eastbound, and M2 westbound to A122 northbound, will be the primary movements needing to be accommodated, and whether there is sufficient capacity to enable east-west movement along the A2/M2 corridor. GH confirmed that the movements to/from A122 and the M2 were the primary movements of the new junction. In terms of east-west movements the Applicant would have two key links: one-way, two-lane parallel connector roads, one in each direction, starting west of the M2/A2/A122 Lower Thames Crossing junction and going through to M2

junction 1. These are important as they are taking out A289 and local traffic from the A122 to M2 link. GH explained that this would avoid traffic weaving in this section, i.e. vehicles changing lanes, and the extra lanes provide the necessary capacity through this specific section.

- 3.1.7 The ExA at this stage sought to clarify their understanding of access at this intersection by using access to the A289 as an example. GH noted that the divergence to the A289 is slightly to the east of the Gravesend east junction, due to the removal of the two existing east-facing slip roads because of the proximity of the M2/A2/A122 Lower Thames Crossing junction. Therefore, a user would go through the Gravesend east junction on the A2 and then onto a frontage road to bypass the M2/A2/A122 Lower Thames Crossing junction as it comes into the M2/A2 corridor. The same would be true westbound from the A289 if one was seeking to access Park Pale, or Darnley Lodge or Brewers Road.
- 3.1.8 GH clarified with respect to the Brewers Road junction that, eastbound, the connections have been retained, but a user cannot access the central A2/M2 route. The Brewers Road junction westbound connections have been removed and re-provided a further kilometre to the west.
- 3.1.9 GH described the local connections as detailed on the Visual Representation of A2/M2/LTC Intersection for ISH3 [\[AS-145\]](#). The key link is a two-way connector road which provides a link from Gravesend East junction along Darnley Lodge Lane to the Brewers Road junction. GH clarified for the ExA that this is also the road that would receive the turning movements out of Thong Lane green bridge south.
- 3.1.10 GH clarified for the ExA that the rationale for the proposed roundabout immediately to the north of Gravesend East junction is to allow ingress to and egress from the southern frontage road to the local road.
- 3.1.11 GH moved through the visual representation noting the key local links to the A122 and the A2/M2. From the bottom of Valley Drive there is a connection directly on to the A122 northbound. There is also a direct route through the junction which goes onto the M2 eastbound and not the frontage road. There is then a connection from the eastbound frontage road up to the A122 northbound. GH clarified the rationale for that is to serve the Strood and Rochester traffic coming onto the frontage road. There is a further southbound A122 link joining the frontage road eastbound rather than the M2. The final local link from the A122 GH outlined was southbound on the A122 joining Gravesend East junction which also includes a direct link back onto the A2. There is also a link from the frontage road onto the local two-way local road so users coming from the A289 or Rochester westbound, as an example, would come off on that link to get to the Gravesend East junction.

Item 3(a)(ii)

Item 3(a)(ii): The ExA will ask the Applicant to explain the function and design of the proposed frontage roads and proposed treatments of intersections and traffic movements including the accommodation of traffic using the current intersection at:

a. M2 junction 2

- b. M2 junction 1/ A289/ A2**
- c. Brewers Road**
- d. Darnley Lodge Lane/ Thong Lane**
- e. Henhurst Road/ Valley Drive**
- f. Wrotham Road**

- 3.1.12 GH noted the key for the visual representations that he spoke to. GH detailed the origin/destination points which are representative of key movements for strategic, major and local traffic through the junction.
- 3.1.13 GH noted that, for the A2 to and from the M2, there will be no change to the existing route. For the route from the A2 to and from A289, the route leaves the central road onto the frontage road; there would be little change to this route with the Project except it would use the new two-lane, one-way parallel frontage roads to avoid conflict with the A122 to M2 traffic. GH noted this is also similar for traffic travel from the A2 to and from A2 Strood, in that there would be little change except it uses the new two-lane, one-way parallel frontage roads. GH then detailed the link from Valley Drive to and from A289. As it currently exists, users enter from the Gravesend East junction using a slip road directly onto the A2 and off at the A289; the reverse would also make use of the slip roads. With the Project, users from Valley Drive to A289 would use the two-way link road on the south side and then join the frontage road on the north side at Brewers Road to get to the A289. Going the opposite direction, a user would enter the frontage road, exit via the roundabout on the local connector two-way link road and then access Gravesend East junction.
- 3.1.14 GH detailed the link from Valley Drive to Cobham via the A2. As it exists, a user would travel along the A2 to Brewers Road, then travel down Halfpence Lane to Cobham. For the reverse route, as there is currently an access at Brewers Road, a user would travel north along Halfpence Lane and join the A2 at the existing Halfpence Lane roundabout. With the Project, this route would use the two-way local connector road to access Cobham and then use the two-way local connector road to do the reverse journey. This takes local traffic out of the A2/M2 links.
- 3.1.15 GH detailed the movement from Shorne to Cobham, which uses Halfpence Lane and Brewers Road into Shorne; the same route is used in reverse. There would be no change to this movement with the Project.
- 3.1.16 GH then detailed the Shorne to the M2 movement. As it exists, users travel via the A226 Gravesend Road, come down the A289 and then join the M2 eastbound. The reverse route is the same. GH noted users can also travel via the A2 and connect at the junction with Brewers Road and the A2/M2. With the Project the route down the A226 is unchanged, but the route via Brewers Road junction to get onto the A2 would use the frontage road which does not connect to the M2, meaning users would go up the A289 and around the A289/A266 junction, coming back down to get on to the M2 eastbound. In reverse, the route would use the M2 and exit via the two-way local connector road at the new Cobham roundabout, turning back on itself to join Brewers Road at the Brewers

Road junction. GH stressed that this would depend on where a user is starting from and the ultimate end destination, noting that the representations assumed a starting point from the middle of Shorne.

- 3.1.17 The ExA sought to clarify that the point at which the decision is made to join the A289, once the A122 is operational, is at Valley Drive. GH confirmed that this was the case. The ExA then sought clarity on the general diversion routes that would be required if a user did miss the relevant frontage road links. GH provided a general overview of diversion routes if a user did miss the relevant frontage road.
- 3.1.18 In response to a question from the ExA on how many local movements would use the single-lane, two-way road at Darnley Lodge Lane, GH noted that the road provides the link from Gravesend East junction to Brewers Road, so any local traffic going to and from Gravesend East junction to either the A289 or to Strood would use this route.
- 3.1.19 The Applicant notes that the ExA's query regarding how the traffic modelling has accounted for traffic movements to and from the Shorne Woods Country Park onto Brewers Road. **[Post Hearing note: Shorne Woods Country Park was operational prior to 2016. As a result journeys to and from the park will be part of the baseline model].**

3.2 Item 3(b) Siting and Land Take

Item 3(b)(i)

Item 3(b)(i): The Applicant is asked to explain the rationale for the siting and land take for this intersection.

- 3.2.1 SR noted that the design of the Lower Thames Crossing has been developed over a period of many years, informed by a detailed understanding of local context and site constraints and through extensive engagement with stakeholders and members of the public. This is set out in more detail in the Project Design Report Part G: Design Evolution [\[APP-514\]](#).
- 3.2.2 SR, when discussing the rationale for siting and land take for the M2/A2/A122 Lower Thames Crossing junction, referred to the Project Design Report Part D: General Design South of the River [\[APP-509\]](#).
- 3.2.3 SR explained that the siting and land take for the junction was dependent on three main factors.
- 3.2.4 The first factor is maximising Project benefits by providing appropriate connections to the existing strategic road network and, where appropriate, the local road network to accommodate the forecast traffic flow.
- 3.2.5 The second factor is taking account of the existing site constraints, broadly these include minimising environmental impact, including impacts on communities, land and property; minimising impacts on physical constraints and working with existing environmental features such as topography and ground conditions.
- 3.2.6 The third factor is designing to ensure operational safety and adherence to relevant standards, which in this case SR explained meant the Design Manual for Roads and Bridges which is the governing standard for trunk roads in the

UK. SR emphasised that it is important that the application of standards is commensurate with the type of road being built. In this instance the Applicant is seeking to build an all-purpose trunk road, which requires adherence with specific standards relating to the highway geometry including horizontal and vertical alignment and junction design in terms of junction spacing and sections of merging and weaving between those junctions. These influence to a degree the extent of land take.

- 3.2.7 In response to the ExA's queries, SR responded that the Applicant is of the view that it has struck the right balance between connectivity and impacts of land take. In essence, if connectivity is reduced in the interests of minimising land take, the result would be an unacceptable impact on scheme benefits.
- 3.2.8 SR then moved on to explain in further detail how the three factors outlined above have influenced the siting and land take for the intersection.
- 3.2.9 Firstly, outlining the site specifics of the M2/A2/A122 Lower Thames Crossing junction, to maximise the benefits of the junction the Applicant is seeking to provide all connections at the A2/M2 but also seeking to provide free-flow links to assist journey times and maximise the Project's benefits.
- 3.2.10 With regards to constraints in the vicinity of the M2/A2/A122 Lower Thames Crossing junction, there are various environmental constraints. In broad terms these include Shorne and Ashenbank Woods Site of Special Scientific Interest (SSSI); Kent Downs Area of Outstanding Natural Beauty (AONB); Claylane ancient woodland to the west of the junction; Shorne Woods Country Park; and the junction is also close to settlements of Thong, Riverview Park and Shorne, including conservation areas of both Thong and Shorne. Regarding physical constraints the site is bounded on the southern side by the High Speed 1 (HS1) railway which is a significant constraint as it would be prohibitively complex to realign HS1 or to construct above or below it. Furthermore, SR outlined there are significant utilities in the area. SR noted that, regarding the topography of the area in relation to the A2 corridor, the junction aligns with a low point in the topography where the junction sits approximately 40m lower than Brewers Road to the east which contributes to mitigating the vertical extents of the junction.
- 3.2.11 With respect to operational requirements, SR noted that as the proposal is for an all-purpose trunk road, there is a requirement to have significant separation between junctions to achieve merging and weaving standards. SR stressed that this is why the strategy to create parallel frontage roads has allowed the Applicant to separate strategic traffic that was using the A2/M2 from the local traffic that currently accesses the A2/M2 to progress east-west to make local connections. Therefore, separating those movements out results in a safer operational layout.
- 3.2.12 The Applicant noted that it will provide a response in writing to the ExA's query on the Applicant's view about the design running speed of the intersection and the Applicant's view as to whether or not the design as proposed sustains that, or whether there would still be some anticipated issues that might lead to congestion. Information on this is provided at A.4 in the Annex to this submission.

Item 3(b)(ii)

Item 3(b)(ii): How did the relationship between this intersection and the settlements of Thong, Riverview Park and Shorne come about?

- 3.2.13 SR explained the relationship of the M2/A2/A122 Lower Thames Crossing junction with the settlements of Thong, Riverview Park and Shorne. The Applicant has sought to strike a balance between the impact on these communities, by aligning the A122 to be broadly equidistant between Riverview Park and Thong. SR explained that the Applicant has sought to utilise existing topography to the advantage of the Project in this location. As the Project progresses north from the A2/M2 junction, the road ramps down towards the South Portal, so that this section of the road is mostly in cutting. This vertical separation helps to mitigate the impacts of the junction and the A122 on nearby communities.

3.3 Item 3(c) Design mitigations

Item(c)(i)

Item 3(c)(i): Have sufficient measures been taken to “meet the principal objectives of the scheme by eliminating or substantially mitigating the identified problems by improving operational conditions and simultaneously minimising adverse impacts” in this location? (NNPS paragraph 4.31)

- 3.3.1 CD outlined how agenda item 3(c)(i) would be answered, dealing with “design mitigation”, first, which is how the Applicant has developed the design of the infrastructure to respond to site and area specific concerns; and then move onto “mitigation design” which would focus on how the Applicant has designed mitigation areas to be multifunctional and balanced the needs and different impacts of the Project, and also meet different requirements of the different design disciplines and stakeholders.
- 3.3.2 CD explained that the place-based design choices and mitigations are many and various across such a large and complex project. The designs were developed through a long and peer-reviewed process, informed by stakeholder and community consultation. Overall, the Applicant submits that the proposals substantially mitigate the Project and comply with both National Highways and the NIC (National Infrastructure Commission) principles of good design. The mitigation measures are described in the Project Design Report [[APP-506](#) to [APP-515](#)]. Mitigation measures are secured through the Design Principles which were recently revised and submitted at Deadline 3 [[REP3-110](#)].
- 3.3.3 CD explained that the mitigation measures were too numerous to list in a hearing, so provided examples of how the design and mitigation has evolved, with reference to visual material contained within the application to demonstrate the Applicant’s response to this question.
- 3.3.4 CD described the overall design narrative as described in the Project Design Report [[APP-506](#) to [APP-515](#)]. All design strategies have been developed with regards to a detailed understanding of the Landscape Character Areas through which the Project route passes. Based on this understanding, the Applicant identified the constraints and opportunities at each location and strategies for

the potential integration of the road infrastructure into that location. By way of example, CD noted that this analysis led to a Project-wide strategy whereby tree planting is used at the junctions as this was contextually appropriate in each location. The benefit of this measure being visual screening of the junctions while also narrowing the field of view of the driver as they navigate the weaves and turns within the junctions.

- 3.3.5 CD then detailed specific design mitigation measures for the M2/A2/A122 Lower Thames Crossing junction, speaking to a photograph looking north towards the River Thames. CD noted there are pockets of woodland surrounding the site including the wooded hilltops around Brummel Hill Woods and Shorne Woods Country Park, as well as a pocket of ancient woodland at Claylane to the west. The site also includes a number of utilities which will require diversions around the new junction.
- 3.3.6 CD outlined in detail the evolution of the mitigation design after Statutory Consultation in response to stakeholder feedback, as a result of which an additional link through the junction was developed. This was accommodated in a tighter footprint as an example of a “design mitigation”. These measures were adopted as, prior to and during Statutory Consultation, the Applicant received advice from the Department for Environment, Food and Rural Affairs (Defra) families about the scale and type of mitigation that the Applicant should provide. In response, slip roads were tightened and pulled away from the affected receptors at Thong. Inclusion of the link meant the height of the junction did increase relative to those properties; in response and to mitigate the visual impacts, 4m false cuts along the edge are to be planted with trees to screen the works. CD noted that the operational elements of the Project were reconfigured: taking the ponds as an example, instead of having one large pond in this location, it was broken down and located throughout the junction to reduce the footprint further.
- 3.3.7 Moving on to “mitigation design” CD noted that at statutory consultation, as the image showed, the land between Gravesend and the junction cutting was filled with tree planting. This was modified after Statutory Consultation as a result of engagement with stakeholders, where it became apparent that providing woodland links in and around the junction would have an undue effect on cultural heritage and the open grassland setting of Thong village. Therefore, at Supplementary Consultation the proposal was revised to provide a woodland edge to Gravesend, but to try and keep some of the open character that was developed to maintain the setting of that village as it is viewed across the M2/A2/A122 Lower Thames Crossing junction. To strike a balance between providing sufficient woodland links and preserving the setting of the area, the proposal was revised again to increase planting prior to DCO Application.
- 3.3.8 CD further highlighted other examples of “mitigation design”; the additional compensatory planting and the pond location in the dry valley north of Thong Lane. These areas were strengthened with more pockets of woodland compensation to create a stronger woodland link around the junction to Brummelhill Woods. Furthermore, the ponds were moved up the hill in response to archaeological investigations that highlighted Mesolithic finds in the lower reaches of the valley.

- 3.3.9 This discussion concluded the Applicant's examples of how the Project mitigates the design and impact of the junction and how the Applicant complies with the requirements of the National Policy Statement for National Networks on good design.
- 3.3.10 In addressing a point raised by Kent County Council regarding the reduction in lanes on the A2 and use of the A2, TW explained that with regard to moving local traffic onto the connector roads, the Applicant's position in terms of the capacity of the road had already been set out. TW emphasised that this additionally will provide a safety benefit. Vehicles making shorter journeys will be able to complete their journey on a connector road rather than having to move on and off the main A2 / M2, while users who are travelling on the main A2/M2 will experience less traffic moving on and off the road.
- 3.3.11 TW addressed an issue raised by Gravesham Borough Council concerning the Applicant providing 3D models and/or visual models of the Project. As agreed at ISH3, the Applicant will provide PDFs at Deadline 4. These has been submitted as the Large Scale Engineering Design Plans [**Document Reference 9.99**]
- 3.3.12 TW addressed a point raised by Interested Parties in relation to signage. TW noted that National Highways operates the strategic road network up and down the country, and while the junctions with the Project road do have a number of connections, they are similar to other highways connections up and down the country. National Highways has significant experience in putting signage in place that supports users in making their journeys around the network.
- 3.3.13 **Post-hearing written submissions:** These are contained within Annex A and include:
- a. Section A.2 – A2/ M2/ LTC Intersection: effect of missed turn to A289 (ISH3 action point 3)
 - b. Section A.3 – A2/ M2/ LTC Intersection: effect of error turn onto LTC (ISH3 action point 4)
 - c. Section A.4 – A2/ M2/ LTC Intersection: mainline congestion (ISH3 action point 5)
 - d. Section A.5 – Response to comments made by Kent County Council
 - e. Section A.6 – Response to comments made by Gravesham Borough Council
 - f. Section A.7 – Response to comments made Shorne Parish Council
 - g. Section A.8 – Response to comments made by Higham Parish Council
 - h. Section A.9 – Response to comments made by Transport for London
 - i. Section A.10 – Response to comments made by Thames Crossing Action Group
 - j. Section A.11 – Response to comments made by Mr Robin Beard

- k. Section A.12 – Response to comments made by Mr John Johnson
- l. Section A.13 – Response to comments made by Port of Tilbury

4 ExA Questions on: A13/A1089/LTC Intersection

4.1 Item 4(a) Review of function and traffic movements

Item 4(a)(i)

Item 4(a)(i): The ExA will ask the Applicant to explain the function of the proposed junction and the route paths through it that can be taken by traffic.

- 4.1.1 GH detailed the function of the proposed A13/A1089/A122 Lower Thames Crossing junction and the route paths through it that can be taken by traffic, speaking to the Visual Representations outlined in the Visual Representation of A13/A1089/LTC Intersection for ISH3 [[AS-146](#)].
- 4.1.2 GH firstly detailed the strategic connections, which are A122 northbound and southbound through the junction which crosses the A13. The next strategic movements are the A1089 northbound onto A122 both northbound and southbound which provide new key links from the Port of Tilbury. The next are existing links from the A1089 to the A13 westbound and A13 eastbound to A1089 southbound. These are existing key links onto and from the A13 for the Port of Tilbury. Furthermore, to the A13 east of A1089 strategic connections include the existing northbound link from the A1089 to the A13 eastbound and the new realigned A13 westbound to A1089 southbound which is via the Orsett Cock junction to provide a local connection.
- 4.1.3 In response to a query from the ExA on why it was necessary to keep the direct connection northbound, but the southbound was designed as an indirect connection using Orsett Cock, GH noted that in a previous iteration of the design, the Project did have a direct connection off the A13 to the A1089 albeit in an altered location. This layout removed the connection from the Orsett Cock junction to the A1089 southbound for local traffic. In the submitted design, the link was altered to provide the connection from the Orsett Cock junction to the A1089 southbound but the A13 westbound to A122 link road constrains the required connection to be via the Orsett Cock junction.
- 4.1.4 Moving through to the major connections between the A122, A13 and the A1089, the major links were detailed by GH as follows: A13 westbound to A122 northbound and A122 southbound to A13 eastbound; A13 westbound to A122 southbound and A122 northbound to A13 eastbound.
- 4.1.5 GH detailed the traffic movements further noting that the journey origin-destination points to be representative of key movements for strategic, major and local traffic through the junction.
- 4.1.6 GH detailed there will be no change to the existing eastbound and westbound A13 main line route. The Orsett to Little Thurrock route will experience change as a result of the realigned Baker Street and A1013, but it will remain a very similar route. The A13 to Orsett connection will still be available with the Project. The A13 westbound to A1089 southbound will use the new link round from Orsett Cock junction to access the A1089 southbound; the reverse route is unchanged.

Item 4(a)(ii)

Item (4)(ii): The ExA will ask the Applicant to explain the function and design of the intersection in relation to the local road network.

- 4.1.7 Local connections detailed by GH included the new local links between the A122, A13 and the A1089. These include A1089 northbound to A122 northbound and southbound; A13 westbound to A122 northbound; and A122 southbound to A13 eastbound and Orsett Cock junction. GH noted there is no access to the A122 northbound or southbound from the Orsett Cock junction. To access the A122 northbound and southbound link roads, users must be on the westbound carriageway east of the Orsett Cock junction. GH further explained that at Orsett Cock junction there is not a direct connection onto the A122 northbound or southbound because of the slip roads connections west of the junction. This is because the realigned slip road from the Orsett Cock junction onto the A13 westbound rejoins the A13 after the A122 link road leaves the A13. The links from the A122 southbound and northbound connect to the A13 eastbound, or join the Orsett Cock junction.
- 4.1.8 Further local roads at the A13/A1089/A122 Lower Thames Crossing junction include the Baker Street realignment and the A1013 realignment.

Item 4(a)(iii)

Item 4(a)(iii): The ExA will ask the Applicant and the Ports for observations on the function and design of the intersection in terms of providing access to the Port of Tilbury, Tilbury 2 and London Gateway Port.

- 4.1.9 GH, referring to the visual representations outlined in the Visual Representation of A13/A1089/LTC Intersection for ISH3 [[AS-146](#)], outlined the access to the ports.
- 4.1.10 GH began by detailing access from London Gateway Port: users would come up the A1014 along the A13 joining the new link road to get access onto the A122 northbound and would also use this route to connect onto the A122 southbound. From the A122, both northbound and southbound, users could come off the A122 onto a slip road, joining the A13 directly, and continue using the A13 eastbound and the A1014 to go into the port. The A122 would provide all movements to and from the A13 east of the Project.
- 4.1.11 Access from Port of Tilbury would be via the A1089 and directly onto the A122 northbound and southbound the other movement onto and off of the A13 are the same as before.
- 4.1.12 The access into Port of Tilbury from the M25 would be from junction 30 along the A13 and use the existing routing. This link would benefit from having less traffic on it. Whilst this would remain as the main route into and out of the port, GH detailed a further alternative that would be available into the Port of Tilbury. This would utilise the A122 northbound, via the Orsett Cock junction and then using the southbound link onto the A1089. Whilst that would be a longer route, it would provide a new connection to the port. That route would also be available coming southbound on the A122.

- 4.1.13 TW then detailed the Applicant's general position about the connectivity to the ports, namely that the ports would retain all of their existing access routes. Along the A13, between the Project and junction 30, traffic is reduced and therefore that access route is improved. The existing direct link from London Gateway through to the A1089 would be replaced by a new route through Orsett Cock for the reasons GH explained. The Project would provide a number of additional routes which provide access to the ports and for London Gateway Port. In terms of routes into Port of Tilbury, users could use Orsett Cock junction but traffic modelling indicates that actually this is not a preferred route. The preferred route as detailed by TW would continue to be the use of the M25 and junction 30 and the A13, taking advantage of the reduced traffic on those routes.
- 4.1.14 TW provided information on passenger car units (PCU's) leaving Lower Thames Crossing, travelling onto Orsett Cock roundabout and then travelling south down the A1089. Further information on this including the numbers provided can be found at Annex A.2 of ISH4 post hearing submission.

4.2 Item 4(b) Siting and land take

Item 4(b)(i)

The Applicant is asked to explain the rationale for the siting and land take for this intersection.

- 4.2.1 SR, when discussing the rationale for siting and land take for the A13/A1089/A122 Lower Thames Crossing junction, referred to Project Design Report Part D: General Design North of the River – Tilbury to the A13 Junction [[APP-511](#)].
- 4.2.2 SR addressed Item 4(b)(i) in the same manner as Item 3(b)(i). SR began with the objective of maximising the Project's benefits by providing appropriate connectivity and to achieve the required capacity to accommodate the forecast traffic flows. There are 16 possible connections that could be made between the A13, A1089 and the proposed A122. The Applicant proposed to prioritise 10 of these (four of which are existing). Therefore six new movements are proposed, which the Applicant submits provide the greatest benefit. In balance, had the Applicant proposed an all-movements junction, it would have resulted in far greater land take and impact on existing constraints.
- 4.2.3 The Applicant determined that the east-facing links onto the A13 would provide the greatest benefit. In terms of the siting of the A122 in relation to the existing connections, it follows that by placing the mainline of the A122 to the east of the A1089, east-facing connections could be made to the A13 without having to cross the A1089, either under or over.
- 4.2.4 Furthermore, this meant that the A122 was kept to the east side of the existing junction, and therefore having less impact on the communities to the west. SR recognised the importance to connect users to the A1089. Therefore, the decision was made to site the proposed junction as close to the A1089, to simplify and minimise the length of connection to it.

- 4.2.5 SR said that whilst a junction further to the east was considered, finding a suitable location in between existing A13 junctions was difficult and it would have made the connections to the A1089 longer and more impactful.
- 4.2.6 Regarding the constraints around the junction, SR noted that these were numerous and include the communities to the west, around Grays, Blackshots, Daneholes, but also to the north and east, particularly Baker Street and towards Orsett. There are various clusters – smaller groupings of properties – mainly residential, to the south and east, including the Whitecroft Care Home. Environmental constraints in this area include various heritage assets and also the Blackshots Nature Area, which is to the west. There are significant utilities in this area, which provide further constraints to the design. Further, there are various local roads which provide important local connections which need to be accommodated within the overall design.
- 4.2.7 SR then detailed the design standards. The design standards are such that placing an entirely new junction between the A1089 and the Orsett Cock junction would be difficult to accommodate, and therefore the Applicant's strategy was to modify and add to the existing connections already provided around the A13, A1089. In design terms, in order to minimise land take SR noted the strategy was to try and replicate some of the existing features in the junction, such as the loop slip roads to the north-west, and to try and contain the junction within that north-western axis and east–west axis, towards the Orsett Cock roundabout.

Item 4(b)(ii)

Item 4(b)(ii): How did the relationship between this intersection and the settlements of Orsett and Baker Street come about?

- 4.2.8 SR noted that an alternative was to site the mainline A122 to the west of the A1089. However, that would have meant that connections back to the east would have had to cross it and this would have meant a greater vertical scale to the junction.
- 4.2.9 To further clarify a query by the ExA on this decision making process, SR noted that when making the decision for the proposed alignment, had the A122 mainline been positioned to the west, although this would have reduced the impact on the existing community around Baker Street, it would have impacted a far greater number of people to the west.

Item 4(b)(iii)

Item 4(b)(iii): Are there any measures that could be taken to limit the effect of the proposed siting and design on the settlement of Baker Street, paying particular regard to the proposed loss of residential property and the proposed proximity of alignments and structures to residential and care home properties that are proposed to remain in situ?

- 4.2.10 The Applicant's response to agenda item 4(b)(iii) was covered by CD under agenda item 4(c)(i).

4.3 Item 4(c) Structures and design mitigations

Item 4 (c)(i)

Item 4(c)(i): Have sufficient measures been taken to “meet the principal objectives of the scheme by eliminating or substantially mitigating the identified problems by improving operational conditions and simultaneously minimising adverse impacts” in this location? (NNNPS paragraph 4.31)

- 4.3.1 CD answered this question in a similar fashion to item 3(c)(i). CD’s submissions were based on discussing mitigation measures through key examples of how mitigations have been incorporated and implemented around the junction, through design evolution.
- 4.3.2 CD prefaced the submissions by noting that there would be unavoidable impacts on cultural heritage on this location, with respect to the loss of listed buildings and the impact on an ancient scheduled monument.
- 4.3.3 CD described the site of the junction with reference to an aerial photograph of the existing A13/A1089 junction from the north, looking back south towards the river. Important features include Baker Street, the Baker Street windmill and the Whitecroft Care Home. It is surrounded by open spaces, notably, Blackshots Nature Area and the Orsett Showground (off screen to the East/left of the image).
- 4.3.4 CD submitted that, through the design process, efforts have been made to reduce the overall layout of the A13/A1089/A122 Lower Thames Crossing junction. Throughout the course of the design, efforts have been made to reduce the overall layout of the junction and the impact of the works on spaces in around the junction. As an example, the design was modified between Statutory and Supplementary Consultation to remove the requirement to realign Rectory Road, which greatly reduced impacts on the Orsett Showground.
- 4.3.5 At Supplementary Consultation, the slip roads were moved north in the design to reduce the impacts on Blackshots Nature Area. Further, considerable effort has been made to reduce the impact on Whitecroft Care Home, such as the relocation of slip roads.
- 4.3.6 With respect to mitigating residual effects, much of the work at this junction has been done through planting and earthworks design. The A13 acts as a natural barrier between the urban edge character area to the south and more rural character to the north. Planting along the existing A13 corridor is read as a sort of wooded ridge line along the horizon, when it is viewed from either side. This supported the strategy of extensive woodland planting around each of the junctions.
- 4.3.7 To reduce visual impacts, additional earthworks and mitigation have been proposed. As illustrated by CD comparing images of Statutory Consultation and DCO Application, this includes reducing the scale of structures and additional mitigation to screen the junction for properties on Baker Street. Furthermore, an earthwork bund outside Whitecroft Care Home is proposed to reduce the effects on Whitecroft Care Home. CD noted the junction makes extensive use of earthwork bunds, some rising up to 9m high above the surrounding ground level.

- 4.3.8 CD then presented views of the junction with Orsett Cock in the foreground looking west. This showed pockets of planting between the various slip roads to screen the works, and the use of false cutting which would screen the road from surrounding views. The integration of such earthworks is crucial, as CD detailed; the Applicant has sought to make them as contextual and tailored to their location as possible. Careful integration is secured through clauses S11.01 and S11.05 in the Design Principles [REP3-110]. Together with tree planting at the junction, CD concluded that the design has successfully balanced the function of the junction with the mitigation of significant effects.
- 4.3.9 In response to a query by Thurrock Council regarding the consideration of active travel and public transport, TW noted that the Applicant has already set out its response in writing, and further signposting would be provided in the post-hearing submission. This signposting is detailed in the following paragraph:
- 4.3.10 Active travel is discussed and considered in the Project Design Report - Part E - Design for Walkers, Cyclists and Horse Riders [APP-512], as well as item 2.1.66 of the Statement of Common Ground (SoCG) between National Highways and Thurrock Council [REP3-092], pages 9 and 10 of the Applicant's Comments on LIRs Appendix H: Thurrock Council (Part 2 of 5) [REP2-063], Section 7.12 of the Transport Assessment (Part 1 of 3) [REP3-112], and Section 7.5 of the Health and Equality Impact Assessment [REP3-118]. Furthermore, with respect to public transport see the response in pages 20 to 22 of the Applicant's Comments on LIRs Appendix H: Thurrock Council (Part 2 of 5) [REP2-063].
- 4.3.11 In response to Thurrock Council's and Port of Tilbury of London Limited's concern on whether the design is suitable for use for future operation of the Tilbury Link Road, TW noted this would be responded to in writing, and signposting to where this matter is set out is provided below. For the purposes of signposting, the Applicant's position on the Tilbury Link Road is provided at items 2.1.167, 2.1.98 and 2.1.99 of the SoCG between National Highways and Thurrock Council [REP3-092] page 42 of the Applicant's Comments on LIRs Appendix H: Thurrock Council (Part 1 of 5) [REP2-062], and item 2.1.25 of the SoCG between National Highways and the Port of Tilbury London Limited [REP3-090]. Further information is provided in Annex A9 of the Post-event submission for ISH4 [Document Reference 9.84].
- 4.3.12 TW, in response to a question on the categorisation of the road networks, drew attention to the Classification of Roads Plans [REP3-061]. These set out the nature of the highway, including defining the sections of road that the Applicant proposes to designate as strategic road network and the sections that would be designated as other highways.
- 4.3.13 TW then outlined the Applicant's in-principle position relating to the benefits of the Project in relation to Thurrock Council and in relation to the performance of the A13/A1089/A122 Lower Thames Crossing junction. The Applicant's Combined Modelling and Appraisal Report Appendix D: Economic Appraisal Package: Economic Appraisal Report [APP-526] has demonstrated that Thurrock will accrue significant economic benefits through the development of the Project. These benefits would be reflected through the better connectivity that the Project would provide to the ports in terms of access out onto the network, and even where the Project does not provide additional connectivity,

benefits would still be accrued due to there being more free-flowing routes. Whilst there is an increase in traffic at Orsett Cock junction, a large part of that traffic is arising from the growth within Thurrock and serving the delivery of growth within Thurrock.

- 4.3.14 In response to the points raised regarding casualties, it was noted that by the measure of casualties on a per kilometre basis, there would be a fall and a reduction in the number of casualties.
- 4.3.15 SR responded to the safety concerns at the A13/A1089/A122 Lower Thames Crossing junction raised by Thurrock Council. As part of the design process, the Applicant is required under the Design Manual for Roads and Bridges (DMRB) GG 119 Road Safety Audit (Highways England, 2020) to undertake an independent road safety audit at different stages of the Project design. At the preliminary design phase, which is the basis of the Applicant's submission, the Applicant is required to commission a "stage one" road safety audit, which it duly did and as part of that the safety concerns highlighted by Thurrock Council were shared with the audit team. The outcome of the audit was then shared with Thurrock Council. It is the Applicant's position that it has achieved a satisfactorily safe design in audit terms.
- 4.3.16 Regarding Thurrock Council's suggestion that the Applicant provide similar slides to those which were spoken to at ISH3 regarding Public Rights of Way, TW suggested that, in light of the Public Rights of Way Plans that have been submitted at Deadline 3, those should be reviewed in the first instance [**Post Hearing Note:** The submissions TW intended to reference were actually submitted at Deadline 2 and comprise the Supplementary Walking, Cycling and Horse Riding (WCH) Maps Volumes A [[REP2-072](#)], B [[REP2-073](#)], and C [[REP2-074](#)]].

Item 4(c)(ii)

Item 4(c)(ii): Is there sufficient design resolution for the structures proposed in this location?

- 4.3.17 This item was covered as part of agenda item 6(b)(ii) as it is a standard response that applies to all structures within junctions.
- 4.3.18 **Post-hearing written submissions:** These are contained within Annex B and include:
- Section B.2 – A13/A1089/LTC (ISH3 action point 8)
 - Section B.3 – Response to comments made by Thurrock Council
 - Section B.4 – Response to comments made by Essex County Council
 - Section B.5 – Response to comments made by the Port of Tilbury
 - Section B.6 – Response to comments made by Thames Crossing Action Group
 - Section B.7 – Response to comments made by Mr Beard
 - Section B.8 – Alternative A13 junction layout proposal from Mr Beard

5 ExA Questions on: M25/LTC Intersection

5.1 Item 5(a) Review of function and traffic movements

Item 5(a)(i)

Item 5(a)(i): The ExA will ask the Applicant to explain the function of the proposed junction and the route paths through it that can be taken by traffic.

- 5.1.1 GH again spoke to the visual representations as submitted pursuant to Procedural Decision 37 [\[AS-147\]](#). Firstly, the strategic connections: the A122 connecting northbound to the M25 and then the existing M25 southbound joining the A122 Lower Thames Crossing. The only other strategic connections are to and from the A127 onto the M25.
- 5.1.2 With respect to the local roads, GH detailed that Ockendon Road and St Mary's Lane are the key roads that cross the M25 at this location.
- 5.1.3 GH then detailed traffic movements. From the M25 northbound to the A127 where there is a difference with the Project because M25 junction 29 is too close to A122 connection, so the Applicant has provided another parallel link road on the west side of the Project. GH detailed this is due to there being insufficient length on the mainline to accommodate weaving. There is little change southbound except that the carriageway has increased from four lanes to five lanes.
- 5.1.4 The Applicant has included dedicated left turns lanes at the M25 junction 29 roundabout, on the northbound off to the A127 westbound, and from the A127 eastbound onto the M25 southbound links.

5.2 Item 5(b) Siting and Land Take

Item 5(b)(i)

Item 5(b)(i): The Applicant is asked to explain the rationale for the siting and land take for this intersection.

- 5.2.1 SR, when discussing the rationale for siting and land take for the M25/A122 Lower Thames Crossing junction, referred to Project Design Report Part D: General Design North of the River – North of the A13 Junction to the M25 [\[APP-510\]](#).
- 5.2.2 SR discussed and explained the rationale for the siting and land take for this intersection with reference to the three factors discussed at 3(b)(i): maximising the Project's benefits, working within existing constraints and achieving a safe layout compliant with relevant standards.
- 5.2.3 SR outlined the connectivity at the M25 tie-in which is proposed to be a connection with north-facing links only, not an all-movements junction.
- 5.2.4 SR outlined that the key constraint is the Upminster and Grays branch railway, which is orientated in a north-west–south-east direction. As GH has explained, the Applicant wanted to bring the A122 Lower Thames Crossing/M25 junction as far south as possible for the purposes of giving the best merging/weaving

length with the M25. To avoid having to cross the railway line twice, in addition to crossing the M25, the Applicant has sited the junction just to the north of the railway. With respect to geometry and compliance with standards, SR outlined that the Applicant seeks to minimise the land take at this location by balancing the requirement to achieve a suitable horizontal radius to bring the road around and under the M25 with the need to minimise the skewed crossing under the M25. SR noted that whilst a larger horizontal radius could have been proposed which could have reduced land take further, that would have meant a more skewed angle of the structure under the M25, which would be more complex to build and potentially more disruptive.

Item 5(b)(ii)

Item 5(b)(ii): How did the relationship between this intersection and the village of North Ockendon come about?

- 5.2.5 The Applicant's response to agenda item 5(b)(ii) was covered by CD under agenda item 5(c)(i).

Item 5(b)(iii)

Item 5(b)(iii): How did the relationship between this intersection and the Thames Chase Forest Park come about?

- 5.2.6 The Applicant's response to agenda item 5(b)(iii) was covered by CD under agenda item 5(c)(i).

Item 5(b)(iv)

Item 5(b)(iv): Are there any measures that could be taken to limit the effect of the proposed siting and design on the Forest Park and on the settlement of North Ockendon, paying particular regard to the use of the Forest Park and the proposed relationship of alignments and structures to residential property?

- 5.2.7 The Applicant's response to agenda item 5(b)(iv) was covered by CD under agenda item 5(c)(i).

5.3 Item 5(c) Structures and Design Mitigations

Item 5(c)(i)

Item 5(c)(i): Have sufficient measures been taken to “meet the principal objectives of the scheme by eliminating or substantially mitigating the identified problems by improving operational conditions and simultaneously minimising adverse impacts” in this location? (NNPS paragraph 4.31)

- 5.3.1 CD took the same approach of outlining the key mitigations at the site and providing examples.
- 5.3.2 CD detailed the local context for the A122 Lower Thames Crossing/M25 junction. The A122 Lower Thames Crossing/M25 junction would be in the character area called Ockendon Open Farmland, which is predominantly arable land looking north upwards to what is called Thames Chase Forest, which is on

the higher ground towards Upminster and Brentwood. The key features of the landscape include the north–south route of the M25 and the railway line.

- 5.3.3 As detailed by CD, at Statutory Consultation, as described in the Project Design Report Part G: Design Evolution [[APP-514](#)], many of the significant measures to reduce the visual and noise impact had already been made between the Preferred Route Announcement and Statutory Consultation. Crossings above the M25 and the railway line were removed, with all slips moved to the east of the railway line, and the northbound A122 to M25 slip road now going underneath the M25 instead of over it greatly reducing its visual impact.
- 5.3.4 Having reduced those impacts, the Applicant has proposed screening with additional tree planting as discussed under agenda items 3 and 4.
- 5.3.5 CD then discussed the Green Infrastructure Study, submitted as Planning Statement Appendix H [[APP-503](#)], which highlighted several third-party strategies and projects to improve green infrastructure in the immediate area of Thames Chase Forest Centre. These included a stakeholder aspiration to improve forest links between pockets of woodland north up to more extensive areas of forest planting. Another measure was to link routes east–west to what is called the forest loop and to the Mardyke valley. This connectivity had been historically stymied by the railway line and existing M25 which creates severance east–west across the landscape.
- 5.3.6 As detailed by CD, the works at the M25 junction 29 raised an opportunity for the Applicant to act in accordance with the National Policy Statement for National Networks (Department for Transport, 2014), paragraph 3.17 of which notes: *‘The government also expects applicants to identify opportunities to invest in infrastructure in locations where the national road network severs communities and acts as a barrier to cycling and walking.’*
- 5.3.7 CD noted the Applicant has sought to provide structures and routes around the junction to address the historic severance, as well as that created by the new A122, through, for example, the provision of a new footbridge that connects both halves of Thames Chase Forest Centre.
- 5.3.8 Mitigation proposed in this area includes the provision of extensive areas of forest planting and earthworks to screen the junction from surrounding receptors. Further key mitigations identified to safeguard existing vegetation within Thames Chase Forest Centre include providing steep embankments to reduce the construction footprint and retain as many trees as possible.
- 5.3.9 Similarly to the M2/A2/A122 Lower Thames Crossing junction in Kent, the Applicant refined tree planting proposals, this time in response to a landowner request to retain their hayfield within the junction. The boundary of tree planting was retained with the rest of the plot cleared for haymaking.
- 5.3.10 To conclude the Applicant’s submissions on agenda item 5, it was submitted that the mitigation design represents a reduction in effects which is consistent with the objectives the NPSNN seeks to achieve.
- 5.3.11 AT noted that the points raised by Essex County Council, London Borough of Havering, Thurrock Council, TCAG and Bellway Homes Limited will be responded to in writing.

Item 5(c)(ii)

Item 5(c)(ii): Is there sufficient design resolution for the structures proposed in this location?

- 5.3.12 This item was covered as part of agenda item 6(b)(ii) as it is a standard response that applies to all structures within junctions.
- 5.3.13 **Post-hearing written submissions:** These are contained within Annex C and include:
- a. Section C.2 – Response to comments made by Essex County Council
 - b. Section C.3 – Response to comments made by London Borough of Havering
 - c. Section C.4 – Response to comments made by Thames Crossing Action Group
 - d. Section C.5 – Response to comments made by Bellway Homes

6 ExA Questions on: Alignment Choices

6.1 Item 6(a) For each of the routes between (a) the A2/M2 and the southern tunnel portal at Thong (b) the northern portal at Tilbury and Baker Street / the A13 (c) the A13 via Stifford, the Mardyke Valley, South and North Ockendon to the M25

Item 6(a)(i)

Item 6(a)(i): Have sufficient measures been taken to “meet the principal objectives of the scheme by eliminating or substantially mitigating the identified problems by improving operational conditions and simultaneously minimising adverse impacts” in this location? (NNNPS paragraph 4.31)

- 6.1.1 CD, in response to the questions raised in agenda item 6(a), outlined that three different instances of mitigation on the three links between the junctions are to be used to illustrate the Applicant’s approach to design and mitigation.
- 6.1.2 The overarching strategy for the mitigation design between the junctions is termed “landscape led”. The strategy, as explained by CD, means the Project responds to the specific context and characteristics of each place through which the Project passes.
- 6.1.3 CD explained that this approach is in contrast to the junction strategy, which has provided generally heavily wooded treatment around each junction.
- 6.1.4 CD noted the landscape led approach has sought to use planting and earthworks to screen the road from view wherever possible and contextually appropriate. Each design response has been tailored to be sensitive to its specific landscape character. As an example, the Applicant has used planting that does not reinforce the linearity of the alignment of the road, and instead responds to local and natural features, such as block planting at field woodlands and other natural features in the landscape. This approach extends to other elements of the road works, for example through the provision of naturalistic landscape and drainage ponds, as secured by the Design Principles [[REP3-110](#)].
- 6.1.5 The first example discussed by CD is the area north of Thong Lane to the South Portal approach: a narrow crossing between the edge of Gravesend and the village of Thong. The character area that the Applicant defined here is called Chalk Sloping Farmland.
- 6.1.6 The impacts on Chalk had been reduced through the movement of the portal to just south of the A226 between Preferred Route Alignment and Statutory consultation. Between Statutory Consultation and Supplementary Consultation, the South Portal was moved a further 350 metres further south. This would help reduce, once again, the impacts on Chalk and Gravesend East. It would also allow better recreational links between Gravesend and Shorne Woods via a new, semi-natural, open space, which the Applicant calls Chalk Park, which also provides essential mitigation for the works. Chalk Park also makes

beneficial use of these cutting materials to provide a wooded hilltop park, appropriate to this local typology, with views out and over the estuary, which also helped to mitigate the Project's traffic impacts during construction. Further refinement was undertaken post-Supplementary Consultation to reduce the impacts of utilities on surrounding properties. The pattern and type of tree planting was also refined, increasing the wooded blocks to break up linearity.

- 6.1.7 The second example as presented by CD is termed the Chadwell link between the North Portal and the A13/A1089/A122 Lower Thames Crossing junction. This area overlooks Linford and East Tilbury, towards West Tilbury. Crucial to this area is the link at Muckingford Road, Hoford Road a protected laneway and the Tilbury Loop railway line. A further important feature is the Chalk escarpment through in this area.
- 6.1.8 The treatment of the landscape in this area demonstrates the landscape led approach. Mitigation planting follows the existing topography of the Chalk escarpment and the shallow valley, rather than trying to reinforce the linearity of the road by planting right up to it. Scrub has been planted within the valley which links pockets of woodland at Ashenshaw and Rainbow Woodland.
- 6.1.9 CD then detailed the green bridges at Hoford Road and Muckingford Road, a key element of mitigation. The green bridges are required for ecological purposes but also to improve the user experience, specifically for walkers, cyclist and horse riders. The design of the green bridges was refined to provide more detailed planting arrangement to help screen the new road and provide boundaries along its alignment.
- 6.1.10 The third example presented by CD was the Ockendon link, between the A13/A1089/A122 Lower Thames Crossing and A122 Lower Thames Crossing/M25 junctions. This sits within the Orsett Fen character area, characterised by long views across a flat landscape in the Mardyke valley. Much of this area is in Flood Zone 3, and it is one of the last remaining areas of fenland that was drained and is now in prime agricultural use.
- 6.1.11 The alignment running through this area is elevated approximately 8.5 metres above the surrounding ground level, due to sitting in Flood Zone 3. Whilst the Applicant has made extensive use of false cutting elsewhere in the Project, the flat, open character would make that incongruous and landscape earthworks are not permitted in the flood zone.
- 6.1.12 The Essex Wildlife Trust identified restoration of the wetland landscape as an aspirational project. This aspiration, CD explained, informed the mitigation proposal for this area at Supplementary Consultation.
- 6.1.13 Later, when it became necessary to relocate water vole habitat, the Mardyke valley, with its wetland character, was identified as a contextually appropriate location for water vole habitat creation. A further example of the existing landscape informing the mitigation proposal is the Project drainage ponds, which were refined to minimise land take and integrate them into the existing field pattern of the area. While this mitigation provided appropriate foreground setting for the viaducts, its exposure in the landscape makes the design of those viaducts, and the preservation of views under and around it, particularly important. It was for this reason that the Mardyke and Orsett Fen Viaducts were designated as Project Enhanced Structures.

Item 6(a)(ii)

Item 6(a)(ii): Is there sufficient design resolution for the structures proposed in these locations?

This item was covered as part of agenda item 6(b)(ii).

6.2 Item 6(b) The proposed M25 improvements

Item 6(b)(i)

Item 6(b)(i): Have sufficient measures been taken to “meet the principal objectives of the scheme by eliminating or substantially mitigating the identified problems by improving operational conditions and simultaneously minimising adverse impacts” in this location? (NNPS paragraph 4.31)

- 6.2.1 CD detailed the improvements around M25 junction 29. The works sit firmly within the Thames Chase Woodland Character area which has pockets of ancient woodland in and around the junction. In close proximity to the site is the Brentwood Enterprise Park application.
- 6.2.2 An issue that was highlighted at Statutory Consultation was that walkers, cyclists and horse riders were already making journeys across the junction on the south side and crossing existing slip roads to take journeys east-west. This situation would be worsened through the introduction of free-flowing slips to the south-side of the junction.
- 6.2.3 At Supplementary Consultation, as with the junctions at the A13 and the A2, the Applicant sought to refine the design to pull the slip roads in and tighten up the alignment.
- 6.2.4 Once the above mentioned severance issue was identified by stakeholders, it became important to remedy the existing severance and resulting safety issues.
- 6.2.5 CD detailed this was addressed by the introduction of two footbridges: one in the east at Brentwood Enterprise Park and one in the west. Both have the benefit of allowing people who are cycling or walking along the A127 to cross to the north side of the road and make use of signalised crossings on the north side of the junction and cross back to continue their east-west journey. This would also improve the historic severance created to north-south movement by the A127.
- 6.2.6 CD noted that the western bridge connecting with Folkes Lane improves access to the new areas of woodland from Thames Chase up to the new woodland at Hole Farm, via the other bridge to the north.
- 6.2.7 In response to a query by the ExA concerning the implications the proposed bridge would have on Brentwood Enterprise Park’s planning application to construct a bridge, SR noted that the Applicant had carried out engagement with the landowner, developer (St Modwen), Brentwood Borough Council and Essex County Council. From this engagement it has been determined that the designs of these bridges are compatible with the other, mutually beneficial and not overlapping.

- 6.2.8 The ExA then queried if the A122 bridge is for walkers, cyclists and horse riders, but the Brentwood Enterprise Park is for motor-vehicles, why not build one bridge that meets both purposes? In response, SR noted that it is a case of timing, where in the event that the Brentwood Enterprise Park is brought forward the existing bridge that crosses the A127 would be repurposed for walkers cyclists and horse riders, meaning that the A122 bridge proposal is not required. Clause S14.22 of the Design Principles [\[REP3-110\]](#) covers this situation.

Item 6(b)(ii)

Item 6(b)(ii): Is there sufficient design resolution for the structures proposed in these locations?

- 6.2.9 AT noted that SR would outline why the design is sufficient in terms of design resolution for the structures generally, therefore covering items 4(c)(ii) and 5(c)(ii) and 6(a)(ii).
- 6.2.10 SR confirmed that the Applicant's position is that there is sufficient design resolution. SR went on to explain why.
- 6.2.11 Firstly, the preliminary structures designs are set out in the various DCO Application Documents, most notably in Project Design Report Part F: Structures and Architecture [\[APP-513\]](#) and the Structures Plans [\[REP3-063\]](#) and [\[REP1-039\]](#). SR noted that the key technical parameters and constraints for each bridge were developed in accordance with the DMRB and other relevant standards to establish structural options and space-proofing requirements for each. These reports investigated different span arrangements, common forms of construction materials which were reasonably conservative and use normal span-to-depth ratios and limitations on skew angles, etc., to give some tolerance for the detailed design development.
- 6.2.12 Deck widths for each bridge have also been extensively reviewed, with respect to design for both vehicles, non-motorised users and, in the case of green bridges, planting zones. As a result, the Applicant has included specific space-proofing requirements within the Design Principles [\[REP3-110\]](#).
- 6.2.13 SR concluded that the primary features of the preliminary design for each structure in its location, the scale and the massing, including headroom clearances, have been resolved to what the Applicant believes is an appropriate level of detail for this stage of design, while maintaining a degree of flexibility to allow final details on structural form, materials and appearance to be developed by the Contractor teams.
- 6.2.14 With respect to the Project Enhanced Structures, SR outlined that the Applicant considers Project Enhanced Structures to comprise Thong Lane green bridge north, the South Portal and North Portal (including approach ramps, retaining walls and Tunnel Services Buildings), the North Portal operational access bridge, the Orsett Fen and Mardyke Viaducts, and the Thames Chase WCH bridge.
- 6.2.15 CD stressed that it is not just the Project Enhanced Structures that the Applicant is concerned with in terms of delivering good design quality. CD noted the various clauses within the Design Principles [\[REP3-110\]](#) which apply to all structures, such as STR.01, STR.07, STR.09 and STR.17. However, in the

development of the Applicant's contextual proposals, it was identified that certain bridges and structures were particularly sensitive as detailed in Section 3.3 of Project Design Report Part F: Structures and Architecture [APP-513]. These are particularly sensitive locations or key thresholds along the Project route. Accordingly, the Applicant has designated the Thames Chase WCH bridge as the first Project Enhanced Structure encountered if travelling from the north, and Thong Lane green bridge north is the first Project Enhanced Structure if travelling from the south.

- 6.2.16 The portals themselves are key thresholds in the Project, marking the transition as road users travel into the tunnel and under the river. Additionally, associated with the North Portal, the access bridge being in such close proximity and the design and composition of the approach roads and ramps make it important that this structure was also designated a Project Enhanced Structure.
- 6.2.17 The reasons given for making the Mardyke and Orsett Fen Viaducts Project Enhanced Structures were given by CD previously above (agenda item 5). With respect to the Thames Chase WCH bridge, this is the first overbridge a driver intending to use the A122 would encounter when travelling from the north. Like other Project Enhanced Structures, the Design Principles include additional constraints on the design to ensure that it responds to its specific context. For example, the Applicant wishes to emphasise that this is a long-spanning footbridge connecting pockets of woodland on either side. That being the overriding character, the Applicant has determined that there should be no primary structure above parapet level to distract from this approach.
- 6.2.18 To conclude, CD emphasised that the Applicant has a number of structure-specific Design Principles for those Project Enhanced Structures, as well as the Project-wide safeguards to quality in general. The Project Enhanced Structures are not the only structures singled out for good design. Rather, through this calibrated approach, the design that the Applicant presented and the design that will go forward should achieve the high quality the Applicant expects in the future.
- 6.2.19 With respect to the ExA's query on the ponds, the visual representation does not represent the final naturalisation required by the Design Principles [REP3-110].
- 6.2.20 The concerns raised by Thurrock Council, London Borough of Havering, Essex County Council, Transport for London, TCAG, Ms Thacker and Mr Beard will be responded to in writing.
- 6.2.21 AT addressed the concerns raised by multiple Interested Parties regarding Local Transport Note (LTN) 1/20 (Department for Transport, 2020). AT clarified that the walking, cycling and horse riding routes are required to be designed in accordance with LTN 1/20 pursuant to the Design Principles [REP3-110], specifically by entry PEO.04.
- 6.2.22 TH noted, in response to the concern raised by Transport for London, that the Applicant would be advancing for Deadline 4 the Applicant's preferred set of proposed protected provisions for the drafting of a consent order. The Applicant would elaborate on the Protected Provisions proposed at ISH7.

- 6.2.23 **Post-hearing written submissions:** These are contained within Annex D and include:
- a. Section D.2 – Response to comments made by Gravesham Borough Council
 - b. Section D.3 – Response to comments made by Shorne Parish Council
 - c. Section D.4 – Response to comments made by Thurrock Council
 - d. Section D.5 – Response to comments made by London Borough of Havering
 - e. Section D.6 – Response to comments made by Essex County Council
 - f. Section D.7 – Response to comments made by Transport for London
 - g. Section D.8 – Response to comments made by Thames Crossing Action Group and Ms Thacker
 - h. Section D.9 – Response to comments made by Mr Robin Beard
- 6.2.24 **Post-hearing note:** CD incorrectly noted that the South Portal had been moved to the north 350m, when it had been moved to the south.

7 Design Resolution and Discharge

7.1.1 The Applicant did not make any submissions in relation to this agenda item.

References

Department for Transport (2014). National Policy Statement for National Networks.

Department for Transport (2020). Local Transport Note (LTN) 1/20: Cycle Infrastructure Design.

Highways England (2020). Design Manual for Roads and Bridges (DMRB) GG 119 Road Safety Audit. Revision 2. Accessed September 2023.

[REDACTED]

[REDACTED]

Glossary

Term	Abbreviation	Explanation
A122		The new A122 trunk road to be constructed as part of the Lower Thames Crossing project, including links, as defined in Part 2, Schedule 5 (Classification of Roads) in the draft DCO (Application Document 3.1)
A122 Lower Thames Crossing	Project	A proposed new crossing of the Thames Estuary linking the county of Kent with the county of Essex, at or east of the existing Dartford Crossing.
A122 Lower Thames Crossing/M25 junction		New junction with north-facing slip roads on the M25 between M25 junctions 29 and 30, near North Ockendon.
A13/A1089/A122 Lower Thames Crossing junction		Alteration of the existing junction between the A13 and the A1089, and construction of a new junction between the A122 Lower Thames Crossing and the A13 and A1089, comprising the following link roads: <ul style="list-style-type: none"> • Improved A13 westbound to A122 Lower Thames Crossing southbound • Improved A13 westbound to A122 Lower Thames Crossing northbound • Improved A13 westbound to A1089 southbound • A122 Lower Thames Crossing southbound to improved A13 eastbound and Orsett Cock roundabout • A122 Lower Thames Crossing northbound to improved A13 eastbound and Orsett Cock roundabout • Orsett Cock roundabout to the improved A13 westbound • Improved A13 eastbound to Orsett Cock roundabout • Improved A1089 northbound to A122 Lower Thames Crossing northbound • Improved A1089 northbound to A122 Lower Thames Crossing southbound
A2		A major road in south-east England, connecting London with the English Channel port of Dover in Kent.
Application Document		In the context of the Project, a document submitted to the Planning Inspectorate as part of the application for development consent.
Construction		Activity on and/or offsite required to implement the Project. The construction phase is considered to commence with the first activity on site (e.g. creation of site access), and ends with demobilisation.
Design Manual for Roads and Bridges	DMRB	A comprehensive manual containing requirements, advice and other published documents relating to works on motorway and all-purpose trunk roads for which one of the Overseeing Organisations (National Highways, Transport Scotland, the Welsh Government or the Department for Regional Development (Northern Ireland)) is highway authority. For the A122 Lower Thames Crossing the Overseeing Organisation is National Highways.
Development Consent Order	DCO	Means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects (NSIP) under the Planning Act 2008.

Term	Abbreviation	Explanation
Development Consent Order application	DCO application	The Project Application Documents, collectively known as the 'DCO application'.
Environmental Statement	ES	A document produced to support an application for development consent that is subject to Environmental Impact Assessment (EIA), which sets out the likely impacts on the environment arising from the proposed development.
Highways England		Former name of National Highways.
M2 junction 1		The M2 will be widened from three lanes to four in both directions through M2 junction 1.
M2/A2/Lower Thames Crossing junction		New junction proposed as part of the Project to the east of Gravesend between the A2 and the new A122 Lower Thames Crossing with connections to the M2.
M25 junction 29		Improvement works to M25 junction 29 and to the M25 north of junction 29. The M25 through junction 29 will be widened from three lanes to four in both directions with hard shoulders.
National Highways		A UK government-owned company with responsibility for managing the motorways and major roads in England. Formerly known as Highways England.
National Planning Policy Framework	NPPF	A framework published in March 2012 by the UK's Department of Communities and Local Government, consolidating previously issued documents called Planning Policy Statements (PPS) and Planning Practice Guidance Notes (PPG) for use in England. The NPPF was updated in February 2019 and again in July 2021 by the Ministry of Housing, Communities and Local Government.
National Policy Statement	NPS	Set out UK government policy on different types of national infrastructure development, including energy, transport, water and waste. There are 12 NPS, providing the framework within which Examining Authorities make their recommendations to the Secretary of State.
National Policy Statement for National Networks	NPSNN	Sets out the need for, and Government's policies to deliver, development of Nationally Significant Infrastructure Projects (NSIPs) on the national road and rail networks in England. It provides planning guidance for promoters of NSIPs on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State.
Nationally Significant Infrastructure Project	NSIP	Major infrastructure developments in England and Wales, such as proposals for power plants, large renewable energy projects, new airports and airport extensions, major road projects etc that require a development consent under the Planning Act 2008.
North Portal		The North Portal (northern tunnel entrance) would be located to the west of East Tilbury. Emergency access and vehicle turn-around facilities would be provided at the tunnel portal. The tunnel portal structures would accommodate service buildings for control operations, mechanical and electrical equipment, drainage and maintenance operations.
Operation		Describes the operational phase of a completed development and is considered to commence at the end of the construction phase, after demobilisation.

Term	Abbreviation	Explanation
Order Limits		The outermost extent of the Project, indicated on the Plans by a red line. This is the Limit of Land to be Acquired or Used (LLAU) by the Project. This is the area in which the DCO would apply.
Planning Act 2008		The primary legislation that establishes the legal framework for applying for, examining and determining Development Consent Order applications for Nationally Significant Infrastructure Projects.
Project road		The new A122 trunk road, the improved A2 trunk road, and the improved M25 and M2 special roads, as defined in Parts 1 and 2, Schedule 5 (Classification of Roads) in the draft DCO (Application Document 3.1).
Project route		The horizontal and vertical alignment taken by the Project road.
South Portal		The South Portal of the Project (southern tunnel entrance) would be located to the south-east of the village of Chalk. Emergency access and vehicle turn-around facilities would be provided at the tunnel portal. The tunnel portal structures would accommodate service buildings for control operations, mechanical and electrical equipment, drainage and maintenance operations.
The tunnel		Proposed 4.25km (2.5 miles) road tunnel beneath the River Thames, comprising two bores, one for northbound traffic and one for southbound traffic. Cross-passages connecting each bore would be provided for emergency incident response and tunnel user evacuation. Tunnel portal structures would accommodate service buildings for control operations, mechanical and electrical equipment, drainage and maintenance operations. Emergency access and vehicle turn-around facilities would also be provided at the tunnel portals.

Annex A Post-hearing submission on Agenda Item 3: A2/M2/LTC Intersection

A.1 Introduction

- A.1.1 This section provides the post-hearing submissions for agenda item 3 A2/M2/LTC Intersection, from Issue Specific Hearing 3 (ISH3) on the 5 September 2023 [[EV-041](#)] for the A122 Lower Thames Crossing (The Project).
- A.1.2 References to ‘visual representations’ are in response to Procedural Decision 37 and were uploaded to the Examination Library: Visual Representation of A2/M2/LTC Intersection for ISH3 [[AS-145](#)], Visual Representation of A13/A1089/LTC Intersection for ISH3 [[AS-146](#)], Visual Representation of M25/LTC Intersection for ISH3 [[AS-147](#)]. [Note: These visual representations will be re-submitted at Deadline 4 to correct a small number of errata.]

A.2 A2/ M2/ LTC Intersection: effect of missed turn to A289

- A.2.1 This item responds to ISH3 action point 3.
- A.2.2 A vehicle traveling eastbound on the A2 that misses the decision point to leave the A2/ M2 for the A289 would be required to take the following route to continue with their journey.
- A.2.3 Continue along the A2/M2 eastbound and use Junction 2 of the M2 to turn around to travel back westbound on the A2/M2. Once on the A2/M2 they would take the existing loop slip road exit onto the A289 to continue their journey. This would result in an additional distance of 6 km.
- A.2.4 It is also noted that the exact diversion will depend on the vehicle’s end destination. If a vehicle destination is within Strood they may leave the M2 at Junction 2 and use the local road network to travel north to their final destination.
- A.2.5 It is worth noting that under existing layouts on the A2/M2 should a driver miss the existing turn to the A289 then the above diversion route would also apply. The design of the A122 connection moves the existing A289 decision point west from its current location and will be signed according to standards to allow drivers to make effective route decisions and manoeuvres. The total distance travelled by a motorist making this error would be almost identical today, compared to a scenario with the LTC junction in place.

A.3 A2/ M2/ LTC Intersection: effect of error turn onto LTC

- A.3.1 This item responds to ISH3 action point 4.

- A.3.2 It should be noted that all decision points with access to the A122 LTC would be clearly signed, this would include Advanced Direction Signage (ADS) that indicates the road number, key destinations, road user charging information and vehicle restriction information. In addition to ADS, there would also be road markings that indicate key information, such as the road user charging symbol. This signage and information would be designed to provide an appropriate level of information to the road user, to minimise the likelihood of confusion and routes being taken in error.
- A.3.3 Should an error occur, the diversion route for a vehicle which has missed the decision point to access the A2/M2 towards Kent and has mistakenly accessed the A122 LTC mainline northbound would be to continue along the A122 LTC route and leave at the A13/A1089 junction. At the A13/A1089 junction there are several routes that could be taken to turn around and return on the A122 LTC southbound to the A2 junction where the motorist could continue their planned journey. These routes result in a total diversion of between 38 – 41.5km.
- A.3.4 As mentioned above, there will be signage on the approaches to the A122 LTC that will notify drivers prior to decision points. Similar signage is in place at the Dartford Crossing and it is worth noting that since the implementation of free flow charging (Dart Charge), use of the crossing in error has not been raised as a significant issue in terms of correspondence.

A.4 A2/ M2/ LTC Intersection: mainline congestion

- A.4.1 This item responds to ISH3 action point 5.
- A.4.2 In traffic modelling a way to measure congestion and running speeds is the assessment of Volume to Capacity (V/C). It is considered that if the volume to capacity ratio is below 85% then congestion is not likely to occur.
- A.4.3 The A2/M2 mainline shows that the V/C is below 85% on the eastbound and westbound carriageways. This demonstrates that the junction design provides adequate capacity on the mainline whilst allowing traffic to merge and diverge.
- A.4.4 Tables 1 and 2 below show the V/C and running speeds on the mainline for eastbound and westbound carriageways during peak periods for 2045, design year. These figures indicate that the mainline performs well at all locations.

Table A.1 Table 1 Volume to Capacity A2/M2 mainline

Design Year	A2/M2 mainline section	V/C % AM	V/C % PM
2045	A2/M2 eastbound west LTC Junction	54	79
2045	A2/M2 eastbound through LTC junction	54	81
2045	A2/M2 eastbound east LTC junction	59	74

Design Year	A2/M2 mainline section	V/C % AM	V/C % PM
2045	A2/M2 westbound west LTC Junction	76	65
2045	A2/M2 westbound through LTC junction	50	41
2045	A2/M2 westbound east LTC junction	70	55
2045	A2/M2 eastbound no LTC junction (Do Minimum)	70	92
2045	A2/M2 westbound no LTC junction (Do Minimum)	92	78

Table A.2 Table 2 Speed on A2/M2 mainline

Design Year	A2/M2 mainline section	AM mph	PM mph
2045	A2/M2 eastbound west of LTC Junction	63	54
2045	A2/M2 eastbound through LTC Junction	62	51
2045	A2/M2 eastbound east of LTC Junction	65	60
2045	A2/M2 westbound west of LTC Junction	57	60
2045	A2/M2 westbound through LTC Junction	65	66
2045	A2/M2 westbound east of LTC Junction	62	66

A.5 Response to comments made by Kent County Council

- A.5.1 *Access to and from Shorne Country Park* – In response to comments from Kent County Council, access to Shorne Country Park will be maintained from Brewers Road from the local highway network. Access to / from the A2/ M2 will be provided via the local connector road on the southern side of the A2/M2 corridor.
- A.5.2 *Agreement of changes to local networks at detailed design* – Article 10 of the draft Development Consent Order (DCO) [REP3-077] sets out that highways works carried out on the local highway network must be completed to the reasonable satisfaction of the relevant local highway authority. This will be supplemented by the protective provisions for local highway authority included in the deadline 4 version of the draft DCO [Document Reference 3.1 (6)].

A.6 Response to comments made by Gravesham Borough Council

- A.6.1 *Presentation of 3D modelling of the route* – The Applicant has submitted further cross-sections at Deadline 2 to further explain the levels and appearance of this junction [REP2-069] and [REP2-070] along with Junction plans submitted at Procedural Deadline B [PDB-003].

A.6.2 *Complexity of the junction and people getting lost* – The placement of signage for the junction will be in accordance with the design Standards. Further design will be the subject of Road Safety Audits to ensure the safety of the junction.

A.7 Response to comments made by Shorne Parish Council

A.7.1 *Presentation does not show all the routes* – The routes presented in the Visual Representation of A2/M2/LTC Intersection for ISH3 [[AS-145](#)] show how strategic and local traffic would use the junction. Whilst it is not possible to illustrate all possible journeys, the intention was to show representative routes from key origins and destinations.

A.8 Response to comments made by Higham Parish Council

A.8.1 *Connection between A289 and LTC NB, prone to traffic issues on LTC blocking up Strood – does this link need to be removed to stop this happening?* – In response to comments raised by Higham Parish Council the links within the junction have been provided to allow the movement of local and strategic traffic, with the connector roads being added to ensure a safe junction layout. If the link between the A289 and LTC was taken out as suggested, this would lead to traffic using other routes to access LTC which in turn could cause local congestion.

A.8.2 *Number of routes converging on Gravesend East junction may make this junction more congested* – The layout of the junction and routes as presented in Visual Representation of A2/M2/LTC Intersection for ISH3 [[AS-145](#)] have been developed to provide the required movements along the A2 corridor and connection onto the A122 LTC. The local two-way road and connector roads are required to facilitate safe merging and diverging of traffic within the junction. They also separate the local and strategic traffic to maintain traffic flows. The Gravesend East junction has been designed with these factors in mind.

A.8.3 *Very few alternatives if the LTC junction is congested* – The introduction of the A122 LTC provides additional network resilience to vehicles wishing to cross the River Thames.

A.8.4 With regards to making wrong turns, see response at section A2 and A3 above.

A.9 Response to comments made by Transport for London

A.9.1 *Does the design of the A2 junction provide resilience to the Dartford crossing, and sufficient capacity on the links (e.g. there is one lane link to the west)?*

- A.9.2 Very few incidents at the Dartford Crossing result in a full closure and therefore a full diversion of traffic from the crossing would be a very rare event. In the majority of incident cases at least two lanes in each direction are maintained at the Dartford Crossing, meaning that not all traffic would be required to divert to an alternative route. In addition, traffic on approach to the crossing and further afield would be informed of the restrictions and advised of alternative route information in advance, which may include using the A122 LTC.
- A.9.3 Therefore, the current junction design is deemed sufficient to provide suitable resilience to manage the majority of incident scenarios.

A.10 Response to comments made by Thames Crossing Action Group

- A.10.1 *Potential for road users to be charged per mile in the future* – This is a matter for the Department for Transport to advise on and not something that the Applicant has control over.
- A.10.2 With regards to traffic migrating from the Dartford Crossing to LTC, see response at A.9.2 above.
- A.10.3 *Connectivity with the M20* – The connection to the M20 via the A228 C Variant was assessed during the development of the route and was ruled out as it did not meet the objectives of the scheme. Further information is detailed in 6.1 Environmental Statement - Chapter 3 - Assessment of Reasonable Alternatives [[APP-141](#)].

A.11 Response to comments made by Mr Robin Beard

- A.11.1 In response to comments raised by Mr Beard in regard to removal of the southern link road – This link allows local movements to be separated from the strategic traffic.

A.12 Response to comments made by Mr John Johnson

- A.12.1 In response to comments raised by Mr Johnson the A2/ M2/ LTC junction has been designed to accommodate the forecast traffic flows in the area. Section A4 above sets out how traffic will flow along this corridor.

A.13 Response to comments made by Port of Tilbury

- A.13.1 In response to a query regarding the route that would be taken should a driver inadvertently cross the river and need to turn around – our response to this is set out in A3 above.

Annex B Post-hearing submission on Agenda Item 4: A13/A1089/LTC Intersection

B.1 Introduction

- B.1.1 This section provides the post-hearing submissions for agenda item 4 A13/A1089/LTC Intersection, from Issue Specific Hearing 3 (ISH3) on the 5 September 2023 [[EV-041](#)] for the A122 Lower Thames Crossing (The Project).
- B.1.2 References to ‘visual representations’ are in response to Procedural Decision 37 and were uploaded to the Examination Library: Visual Representation of A2/M2/LTC Intersection for ISH3 [[AS-145](#)], Visual Representation of A13/A1089/LTC Intersection for ISH3 [[AS-146](#)], Visual Representation of M25/LTC Intersection for ISH3 [[AS-147](#)]. [Note: These visual representations will be re-submitted at Deadline 4 to correct a small number of errata.]

B.2 A13/A1089/LTC

- B.2.1 This item responds to ISH3 action point 8.
- B.2.2 The number of vehicles using Orsett Cock roundabout to access the Tilbury Port and Tilbury 2 has been assessed in the traffic model by extracting the number of vehicles that make the movement from the A122 LTC northbound and southbound to the A1089 southbound. These movements would use the Orsett Cock roundabout. It should be noted that most of the traffic to the Port uses M25 junction 30, A13 and A1089 rather than using the LTC and the Orsett Cock roundabout.

Table B.1 Vehicle M

Note: values may not sum due to rounding

Table B.2 Vehicle Movements To Tilbury Ports (2045)

Tilbury port						Tilbury 2				
	Car	LGV	HGV	Total (vehicles)	Total (pcu)	Car	LGV	HGV	Total (vehicles)	Total (pcu)
LTC South AM	18	0	21	39	71	3	0	6	9	18
LTC North AM	4	0	0	4	4	7	0	0	7	7

Tilbury port						Tilbury 2				
	Car	LGV	HGV	Total (vehicles)	Total (pcu)	Car	LGV	HGV	Total (vehicles)	Total (pcu)
LTC South IP	14	0	32	46	94	2	0	10	12	27
LTC North IP	13	0	0	13	13	2	0	0	2	2
LTC South PM	6	1	13	19	38	0	0	4	4	10
LTC North PM	19	0	0	19	19	1	0	0	1	1

Note: values may not sum due to rounding

B.2.3 The movement between A122 LTC and the A1089 would not only be used by Port traffic. The tables below provide the total flow for the movements between A122 LTC and the A1089. This accounts for vehicles using the A1089 to access the local highway network to reach areas such as the Amazon warehouse and the Tilbury residential area, which are captured in these figures.

B.2.4 The figure provided below are hourly movements in the AM and PM peaks.

Table B.3 Vehicle movements from the Project to A1089 via Orsett Cock

Route	Am 2030			PM 2030			AM 2045			PM 2045		
	Cars	LGV	HGV	Cars	LGV	HGV	Cars	LGV	HGV	Cars	LGV	HGV
LTC North to A1089	16	0	0	89	17	0	83	0	0	136	17	0
LTC South to A1089	119	25	35	137	15	21	136	27	35	216	17	20

Table B.4 Total Vehicle movements from the Project to A1089 via Orsett Cock

Route	Am 2030	PM 2030	AM 2045	PM 2045
LTC North to A1089	16	106	83	153
LTC South to A1089	178	172	198	253

B.3 Response to comments made by Thurrock Council

- B.3.1 In response to comments raised by Thurrock Council at ISH3, within the Visual Representation of A13/A1089/LTC Intersection for ISH3 [[AS-146](#)] the three connection types presented are:
- a. A Strategic connection is one with a destination on the strategic road network, for example the A1089 or A122 LTC. These are routes that are usually operated and maintained by National Highways.
 - b. A Major connection is one with a destination on the major road network, for example, the A13 east of the proposed junction. These are routes that are usually operated and maintained by the Local Highway Authority.
 - c. A Local connection is one with a destination on the local road network for example A1013 or A128. These are routes that are usually operated and maintained by the Local Highway Authority.
- B.3.2 The routes presented are to show connections between road types and are not intended to represent the limit of the strategic road network.
- B.3.3 Where there are current public transport routes on the local road network the junction design has allowed for this, including provision for relocation of bus stops along the A1013. The Applicant is not seeking any powers to stop public transport providers from using the new junctions or A122 LTC carriageway to provide public transport services.
- B.3.4 The requests for further information in the form of whole route zoomable pdfs has been made to the Applicant, who will submit this at Deadline 4.
- B.3.5 With regards to the points raised about the detailed design of Orsett Cock junction and the extent of the weaving length of 200m on the approach to the junction in the model not being reflected in the design. The draft DCO [[REP3-077](#)] the provision of Limits of Deviation allows flexibility for development during the detailed design stages. The horizontal Limits are represented on the 2.6 Works Plans Volume C [[REP3-039](#)]. The Applicant is satisfied that these allow the flexibility to provide the additional length between the merge point and circulatory stop line as represented in the modelling.
- B.3.6 The Applicant wishes to clarify that the traffic modelling has not been done in isolation as suggested by Thurrock Council and has been closely coordinated with the design throughout the project development.
- B.3.7 The Applicant can confirm that the looped slip-road for the A1089 to A13 eastbound movement does comply with the relevant standards in the Design Manual for Roads and Bridges and that this design has been subject to a Stage 1 Road Safety Audit, undertaken by an independent auditor.

B.3.8 With regards to the Tilbury Link Road the Applicant has made their position on this very clear in a number of submissions.

B.4 Response to comments made by Essex County Council

B.4.1 In response to comments made by Essex County Council in support of the comments by Thurrock a response is provided in section B.5 above.

B.5 Response to comments made by the Port of Tilbury

B.5.1 In response to comments made by the Port of Tilbury, the design of the A13/A1089/A122 Lower Thames Crossing junction has been developed to maintain existing connections and provide new connections to the strategic road network.

B.5.2 The four existing connections between the A1089 and A13 are maintained, three in their current form and the fourth via Orsett Cock junction. The two ‘west facing’ connections to the A13 will additionally benefit from a reduction in traffic on the A13 and M25 (Dartford Crossing). Our assessment shows that these will remain primary routes to the Port of Tilbury from the M25. The Applicants position therefore is that with regards to existing connections alone, the Port of Tilbury will be a net beneficiary of the LTC proposals.

B.5.3 Additionally, two new direct connections will be possible from the A1089 to the A122 LTC (one northbound onto LTC and the other southbound onto LTC). The Applicants position is that these new routes will be of benefit to the Port of Tilbury as they provide connections that don’t currently exist including an alternative option for crossing the Thames southbound.

B.5.4 Finally, as presented in Visual Representation of A13/A1089/LTC Intersection for ISH3 [[AS-146](#)] there are also two further routes available from the A122 LTC to the A1089 via the Orsett Cock Junction with the number of vehicles using these routes presented in section B.2. Again, it is the Applicant’s position that by providing connections that don’t currently exist, the LTC proposals are providing benefit to the Port of Tilbury.

B.6 Response to comments made by Thames Crossing Action Group

B.6.1 With regards to the Travellers’ Site, the engagement undertaken by the Applicant in relation to this facility is set out in the Project Design Report: Part F Section 6 [[APP-513](#)] which summarises the development of design proposals for Gammon Field Travellers site that included consultation with Thurrock Council and the Travellers themselves.

- B.6.2 The agreed layout for the Travellers site, and constraints around its further development, are described through the Project Design Principles [[REP3-110](#)] Principle S11.12 (page 64) with reference to an Indicative Plan shown in Appendix C of that document. These measures are secured through Requirement 12 of the Draft Development Consent Order [[REP3-077](#)].
- B.6.3 In addition to the existing connections between the A13 and A1089 which will remain (with one being re-routed via the Orsett Cock junction) the design of the A13 – A1089 - LTC junction has also been developed to provide new direct access from the A1089 to the A122 LTC (northbound and southbound). Access to the port can also be made via the existing links to the A13 and M25 which will see a reduction in traffic as a result of the A122 LTC proposals. Finally, as presented in Visual Representation of A13/A1089/LTC Intersection for ISH3 [[AS-146](#)] routes are available from A122 LTC to the A1089 via the Orsett Cock Junction with the number of vehicles using these routes presented in section B.2.
- B.6.4 Local journeys to and from the A122 LTC are set out in Visual Representation of A13A/A1089/LTC Intersection for ISH3 [[AS-146](#)]. Local traffic wishing to access the A122 LTC could do so via the A1089 (which connects to LTC northbound and southbound) or via the A13 from the east.
- B.6.5 In the event of an incident on the QEII bridge which results in its closure, an incident response plan would be instigated which would include use of the Dartford Crossing east tunnel for southbound traffic. This would maintain two lanes in each direction at the Dartford Crossing, meaning that not all traffic would be required to divert to an alternate route. Traffic on approach to the crossing and further afield would be informed of the restrictions and advised of alternative route information, which could include joining the A122 LTC south of M25 J29.

B.7 Response to comments made by Mr Beard

- B.7.1 The detail of the development of the A13 junction and the alternatives reviewed are set out in section 3.22 of 6.1 Environmental Statement - Chapter 3 - Assessment of Reasonable Alternatives [[APP-141](#)].

B.8 Alternative A13 junction layout proposal from Mr Beard

- B.8.1 At Deadline 1 Mr Beard submitted 13 plans showing his proposed alternative route and junction arrangement at the A13. [[REP1-403](#)] He also provided commentary as to the reasoning behind his design and impacts/ benefits of those layouts.
- B.8.2 The Applicant has carried out a high level review of Mr Beard's design across three areas: geometrical design, traffic impact and environmental impacts.

- B.8.3 Mr Beard proposed two different junction layouts within his submission. We believe his second layout was developed from his original concept proposal and it is this second layout presented and shown in Maps 11 to 13 of [\[REP1-403\]](#) that the Applicant has reviewed. Applicant has reviewed.
- B.8.4 A geometrical review of Mr Beard’s alternative proposed LTC mainline and junction layout looked at the horizontal and vertical constraints. The following points emerged from the review:
- a. The alternate route would result in an additional length to the LTC mainline of approximately 1.5km.
 - b. There would need to be multiple departures from standard within the junction layout due to the geometric layout.
 - c. The junction with the A128 would require the widening of the A128 to Orsett Cock junction to accommodate the additional traffic created by this link. This would cause severance of local accesses on the A128. This is a similar scenario as presented in the layout of this junction at Preferred Route Announcement as detailed in Table 3.18 of Environmental Statement Chapter 3: Assessment of Reasonable Alternatives [APP-141].
 - d. The layout would require the redesign of the existing Manorway Interchange, to accommodate the additional arm from the Mr Beard’s alternative proposed LTC mainline onto the circulatory carriageway. An increase in capacity of the junction would also be required to accommodate the additional A122 LTC traffic the layout would place through Manorway junction.
 - e. There would be a requirement to realign a significant length of the A1013 south to allow for the proposed link road south of the A13. This would affect a significant area of land and a number of properties to the south of the A1013.
- B.8.5 A review of the potential traffic impact of the alternative routes is summarised below:
- a. Mr Beard’s proposal does not include direct links from the A1089.
 - b. Providing an additional arm on the Manorway junction would likely cause an increased impact on the capacity of the junction and cause significant to road users including London Gateway Port during construction.
 - c. The addition of 1.5km to the LTC mainline would have a slight increase in journey time.

- d. The secondary junction on the A128 linking south into Orsett Cock would result in an increase in flows on the A128. This link would then require dualling and improvements to the Orsett Cock junction.

B.8.6 The outcomes of the environmental review are summarised below:

- a. The route proposed by Mr Beard would require the relocation of an electricity pylon as it crosses to the west of proposed LTC route just north of Muckingford Road.
- b. The proposed LTC mainline route would require the realignment or diversions of multiple Non-Motorised User routes.
- c. Moving the mainline LTC route to the east would have a greater impact on Orsett Golf course running along the eastern edge which also includes historic landfill sites.
- d. Mr Beard's route would need to pass over the A13 on a structure, which itself would create a visual impact on nearby communities.
- e. The alternative junction design would have a negative environmental impact on Southfields and Stanford Le Hope areas due to the relocation of the A1013 and raised level of the junction link roads
- f. North of the A13 the junction links pass close to a number of properties on Horndon Road that are not currently affected by the proposed scheme.

B.8.7 The alternative mainline and junction layout proposed by Mr Beard would require further development to minimise departures from standard. This would further increase the size of the junction. It would also increase the vertical height of the links over the A13 and realignment/ redesign of local roads and significant changes to the Manorway junction.

B.8.8 Mr Beard's proposed Manorway junction design would require the introduction of another arm and together with the satellite junction on the A128, this would lead to negative environmental impacts and increases in traffic flows at both Manorway and Orsett Cock junctions.

B.8.9 Mr Beard's layout does not provide direct access to the Port of Tilbury and would have a negative impact on London Gateway Port during the redesign of Manorway junction.

B.8.10 Overall, the Applicant is of the view that Mr Beard's alternative alignment and junction proposal would have additional traffic and environmental impacts when compared to the LTC proposal.

Annex C Post-hearing submission on Agenda Item 5: M25/LTC Intersection

C.1 Introduction

- C.1.1 This section provides the post-hearing submissions for agenda item 5, M25/LTC Intersection, from Issue Specific Hearing 3 (ISH3) on the 5 September 2023 [[EV-041](#)] for the A122 Lower Thames Crossing (The Project).
- C.1.2 References to ‘visual representations’ are in response to Procedural Decision 37 and were uploaded to the Examination Library: Visual Representation of A2/M2/LTC Intersection for ISH3 [[AS-145](#)], Visual Representation of A13/A1089/LTC Intersection for ISH3 [[AS-146](#)], Visual Representation of M25/LTC Intersection for ISH3 [[AS-147](#)]. [Note: These visual representations will be re-submitted at Deadline 4 to correct a small number of errata.]

C.2 Response to comments made by Essex County Council

- C.2.1 In response to the comments raised by Essex County Council the design of the junction allows the free flow movement from the M25 to the A122 LTC southbound two-lane section. This section is proposed as two lanes in response to traffic modelling, which shows that it will provide sufficient capacity for the predicted flows. This information is detailed in in section 7.2 of 7.9 Transport Assessment [[REP3-112](#)].

C.3 Response to comments made by London Borough of Havering

- C.3.1 As noted by the London Borough of Havering, the Applicant has diligently collaborated with them to address their concerns regarding the closure of Ockendon Road. The following paragraphs address this matter via two key aspects: firstly, the duration of the Ockendon Road closure, and secondly the diversionary routes.
- C.3.2 Regarding the closure duration, the Applicant has taken proactive measures to mitigate its effects. Specifically, they have committed to implementing a 10-month cap on the Ockendon Road closure, a commitment that is formally secured in the SACR under item 7. The Applicant believes that this approach and level of commitment is proportionate to the current stage of the project.
- C.3.3 Secondly, concerning the diversionary routes, the Applicant has presented proposed diversion routes for the Ockendon Road closure. These routes take into consideration minimising the anticipated increase in journey time, as outlined in Table 4.5 of the oTMPfC [**Document Reference 7.14 (4)**]. These proposed diversion routes provide a starting point for future dialogues between

the Contractor and the local highways authority. The exact diversion route will be an integral part of the Traffic Management Plan (TMP) and will account for various variables, including potential impacts from external project-related works that may affect the road network, albeit currently unknown.

- C.3.4 The Applicant has recognised the crematorium as a key stakeholder as identified within Table 2.3 of the oTMPfC [**Document Reference 7.14 (4)**], whereby the minimum considerations to be implemented in the Traffic Management Plan is detailed. This includes maintaining access, early engagement and advance warning of works impacting the crematorium.
- C.3.5 The Applicant believes that the balance struck between the committed traffic control measures at this project stage, coupled with the initiation of early discussions between the Contractor and the local authorities as the detailed design phase advances, constitutes a robust approach to addressing and alleviating the concerns raised by the London Borough of Havering. In addition via the Traffic Management Forum (TMF), London Borough of Havering are able to further work with the contractors to develop and deliver where necessary measures during the construction phase. This iterative process is supported by real-time monitoring data, ensuring an adaptive and responsive mechanism.

C.4 Response to comments made by Thames Crossing Action Group

- C.4.1 In response to comments raised by Thames Crossing Action Group, the removal of Cranham solar farm is required to provide the M25 connector road. This connector road is provided due to the distance between the A122 LTC junction and junction 29, this removes the weaving on the M25 between these junctions.

C.5 Response to comments made by Bellway Homes

- C.5.1 The Applicant has made various changes to the Project to reduce the impact on the proposed Bellway development land to the north of South Ockendon. Further information is set out in Comments on WRs Appendix F – Landowners [[REP2-051](#)]. The development land is not currently in Thurrock's Local Plan and there are no active planning applications for the site.
- C.5.2 The Applicant met with Bellway on 1 September 2023 and will continue to engage collaboratively through the consenting, design and implementation stages of each project to ensure that impacts on the proposed housing development are minimised.

Annex D Post-hearing submission on Agenda item 6: Alignment Choices

D.1 Introduction

D.1.1 This section provides the post-hearing submissions for agenda item 6, Alignment choices, from Issue Specific Hearing 3 (ISH3) on the 5 September 2023 [[EV-041](#)] for the A122 Lower Thames Crossing (The Project).

D.2 Response to comments made by Gravesham Borough Council

D.2.1 In response to comments made by Gravesham Borough the design evolutions and mitigation for the A2 corridor is set out in Parts D & G of the Project Design Report [[APP-509](#)] and [[APP-514](#)]. The Applicant has developed the design to minimise the impact on the surrounding area and mitigated the impacts as far as reasonably practicable.

D.3 Response to comments made by Shorne Parish Council

D.3.1 In response to the comments made by Shorne Parish council the landscape design at the A2 junction is in line with the general principal of woodland planning around junction. The development of this design is set out in Section 8 of the Project Design Report Part G [[APP-514](#)].

D.3.2 The user ambience has been a key constraint in the development of the design and mitigation, as can be seen within the Project Design Report Part E Design for Walkers, Cyclists and Horse Riders [[APP-512](#)]. Several design principles have been provided to ensure the design provides the required mitigation outcomes [[REP3-110](#)].

D.4 Response to comments made by Thurrock Council

D.4.1 In response to the comments made by Thurrock Council that the Tilbury viaduct is not proposed to be a project enhanced structure, the full design rationale for 'Project Enhanced Structures' can be found in the Project Design Report - Part F: Structures and Architecture [[APP-513](#)]. The Applicant has sought to secure additional commitments within the Design Principles document [[REP3-110](#)] to ensure that the Preliminary Design presented at DCO is carried through to detailed design and implementation. There are Design Principles for all structures across the Project, with the aim of ensuring the designs (STR.07):

- a. use a complementary and consistent material palette

- b. are well detailed and coordinated
- c. are integrated sensitively and seamlessly into the landscape.

D.4.2 The Tilbury viaduct has not been included as a 'Project Enhanced Structure' for the following reasons:

- a. It is already taller than the Mardyke Viaduct relative to the surrounding ground level, giving it better proportions and greater clearance for views under and through it.
- b. In terms of long views, the landscape is less open with more woodland areas trees and hedge lines breaking up views. Through the landscape design, the existing wooded ridge would be strengthened with new tree planting, which (once mature) will effectively screen and integrate the viaduct on both sides.
- c. The existing landscape already has a number of urbanising structures like the Overhead Line Electrification associated with the Tilbury Loop railway and in particular, parallel lines of pylons on a north-south axis.

D.4.3 As a result of these factors it was felt that a good, but more standard approach would be appropriate here. This matter is not agreed, due to both parties' positions remaining unchanged.

D.4.4 The design standards to be used of the Walkers, Cyclists and Horse riders routes are set out in PEO.04 for the Design Principles [[REP3-110](#)] and includes LTN 1/20.

D.5 Response to comments made by London Borough of Havering

D.5.1 The walkers, cyclists and horse-riders bridge over the A127 located west of the M25 Junction 29 is proposed to address historic severance and concerns raised by London Borough of Havering over connectivity in this area. While the Applicant recognises the potential benefits of the non-motorised user route proposed by LB Havering, this is not required to mitigate issues arising because of the Project.

D.5.2 This is addressed in further detail in the 9.87 Post-event Submissions including written submission of Oral Comments for ISH7, and also in the response to REP1-250 and REP1-253 in Comments on WRs Appendix C – Relevant Local Authorities & Transport Bodies [REP2-048].

D.6 Response to comments made by Essex County Council

- D.6.1 In response to the comments Made by Essex County Council the design standards to be used of the Walkers, Cyclists and Horse riders routes is set out in PEO.04 for the Design Principles [[REP3-110](#)] and includes LTN 1/20.

D.7 Response to comments made by Transport for London

- D.7.1 The Applicant notes Transport for London's (TfL) desire to have further information on the detailed design of the proposed A127 (west) Walking, Cycling and Horse-riding bridge. The Applicant will continue to engage with TfL throughout the detailed design phase.

D.8 Response to comments made by Thames Crossing Action Group and Ms Thacker

- D.8.1 In response to comments raised by Thames Crossing Action Group, the design of the project will include technology such as variable message signs which can advise caution and give instructions in the event of fog or high winds.

D.9 Response to comments made by Mr Robin Beard

- D.9.1 In response to comments made by Mr Beard, the alignment has been reviewed throughout the development of the scheme. A route further to the northeast as set out in [[REP1-403](#)] would still require the route to be elevated above ground level due to flood risk.

Annex E Post-hearing submission on Agenda Item 7: Design resolution and discharge

E.1 Introduction

- E.1.1 The hearing closed prior to this agenda item therefore, no further submissions for this agenda.

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