

Appendix 4

Lower Thames Crossing Supplementary Consultation Appraisal

Introduction

1. This document examines the implications of the Supplementary Consultation by Highways England on the Lower Thames Crossing (LTC) that started on 19 January 2020 and now finishes on 2 April 2020. It is based on the published material which considers the changes to the project since the Statutory Consultation that was carried out in the autumn of 2018 which was considered by the Council at its meeting on 18 December 2018. It does not therefore take account of any clarifications provided by the project that are not in written form in the consultation documentation. The Supplementary Consultation does not revisit the previous consultation or seek to address all the issues raised by the Borough Council or other parties at that time.
2. This document is written to be read as a standalone report and is structured in four parts:
 - i. Description of the proposed changes to the scheme as previously consulted upon
 - ii. New proposals that arise from work done since 2018 on utility diversions and how the scheme might be constructed
 - iii. Transport network implications of the proposed changes
 - iv. Environmental implications of the proposed changes.
3. Annex 1 contains links to the 2018 and the 2020 consultation documents and a list of the 2020 documents taken into account in this document. Annex 2 contains information from the Guide to Supplementary Consultation outline plans of the location of the main changes. Annex 3, from the same source, contains information on the proposed changes to the Public Rights of Way (PROW) network.
4. The project continues to be developed by Highways England so will change further. Some elements are known to represent 'worst cases' where the project hopes to produce a 'better' result when the Development Consent Order (DCO) is submitted.
5. The environmental implications, however, have to be considered both in terms of their direct implications (benefits or impact) but also how they sit with the scheme overall, since that is what will matter in the final analysis.
6. The overall basic route and design remains the same – that is two bored tunnels under the Thames emerging south of the A226 in a deep cutting, climbing up towards the A2. Thong Lane is passed beneath on a new land bridge from where the LTC splits into free flow slips onto the A2 to the west and east. Mixed up with these are the linkages from the Marling Cross junction (Gravesend East) for local traffic north into the urban area of Gravesend and south to Cobham. The current A2 east of Marling Cross is rebuilt through the Kent Downs AoNB to provide the A2/LTC connections to the M2 and A289 (Wainscott bypass plus the A2 Watling Street into Strood).

7. For clarity on what functions various road links perform (as opposed to what they may legally be designated in due course):
- i. Access to/from the A289 means access to the parallel roads north and south of the main road which serve the A289 Wainscott Bypass and the A2 Watling Street (a local road) into Strood and start just east of Marling Cross
 - ii. M2 means access to the M2 coast bound, which is effectively extended west from Junction 1 to a point just east of the existing Marling Cross junction (Gravesend East)
 - iii. Local link road means the local road link to the south of the main road and north of HS1 running from Marling Cross to the Halfpence Lane roundabout at Cobham. Note that the existing section of this running east-west south of the Inn on the Lake was named Thong Lane but has recently been renamed Darnley Lodge Lane to sort out address confusion in this area (and is noted related to the LTC proposals).

Major changes

8. The major proposed changes are set out below working from the River Thames in the north to the A2 in the south. The description does not aim to cover every element, which can be obtained by a detailed study of the plans and the consultation documents. Annex 2 and Annex 3 contain summary outline plans and the full details can be found in the consultation documentation.
- i. South to north, a bored tunnel (5.8m diameter) under the marshes for ground stabilisation works before the main tunnel boring machines arrive. This includes construction sites, on the Lower Higham Road and on the marshes north of the railway and canal (edge of Metropolitan Police Firing range).
 - ii. Extension of the site area along the A226 Rochester Road for construction purposes, the temporary storage of chalk spoil to be moved after completion of construction, and the creation of 'Chalk Park' adjacent to the LTC and Cascades.
 - iii. Three options for the location of a 50x50m electricity sub-station along the A226. This is required to provide the power needed during construction and for the tunnel systems on completion.
 - iv. Extending the Thames tunnel by 350m to the south from its previous location just south of the A226 (which was 600m from its original location near the Lower Higham road - so the total movement since 2016 is about 950m). The service and maintenance road from the A226 is extended in length to the new portal location, which retains an access loop road over the top.
 - v. Resultant changes to the Public Rights of Way network in this area since it is proposed to divert these round the tunnel portal rather than over a bridge across the cutting.
 - vi. Changes to the planting proposals and their extent in the corridor from the A226 to the A2 compared with those shown in the 2018 consultation
 - vii. Widening of the Thong Lane land bridge from 60m to 84m

- viii. Demolition of three additional residential properties and a business at Thong which were previously shown as having only their access affected or not directly impacted at all.
- ix. Inclusion of a new planting area SW of Marling Cross junction towards Ifield on land used initially for utility diversions
- x. Revised A2 junction of a more compact design and including a direct link from the Marling Cross junction onto the M2 coastbound
- xi. Loss of the Cobham on/off slips at Halfpence Lane (south side) and movements off M2/A289 to be relocated to slips onto the local link road further west towards Marling Cross
- xii. Narrowing of M2/A289 through the AoNB with loss of any central reservation planting and narrowing of lanes.
- xiii. Increasing width of Thong Lane South from 16m to 30m and the realignment of Brewers Road bridge to avoid works to HS1 structures.
- xiv. Amended proposals for the diversion of NCR177 cycle route to the south of the HS1 and other public rights of way alterations.
- xv. Provision for utility diversions:
 - a) New electricity cable under old A2 from Pepper Hill, Northfleet to Marling Cross and then north past Claylane Wood to tunnel portal area and the proposed electricity substation
 - b) Diversion of a major gas main from Marling Cross to Park Pale via Thong Lane Land Bridge, Inn on the Lake, and southern edges of Shorne Wood Country Park and Brewers Wood
 - c) Utilities diversion provision under A226 from the tunnel portal through Higham and another under Halfpence Lane, The Street, Jeskyns Road and Henhurst Road Cobham
 - d) Southern route for utilities from just west of Marling Cross junction under A2 and HS1, east beneath Jeskyns and thence north under Ashenbank Wood to Park Pale or top of Halfpence Lane. An extension along northern edge of Cobham Park next to HS1 to the Rochester and Cobham Park Golf Club access at Park Pale on the south side of the current A2
 - e) Possible construction routes – mainly A2, A226, A289 but also Lower Higham Road and Ordnance Road/Canal Road to access the work sites on the marshes. A haul route is proposed from the A2 (former Cobham North services) north to the tunnel portal area

Additional information

- 9. The paragraphs below provide additional information to give clarity on some of the proposals listed above.
- 10. The south to north tunnel is at a shallower depth (5-10m) than the main bores (20m+) and is to provide for ground stabilisation where needed in the sands, gravels and clays that form the marshes. This would involve injecting material into the ground to stabilise it for the main boring machines to pass through. It is proposed to be 5.8m in diameter and backfilled when it has fulfilled its function.

The tunnel boring machine would start from a new construction site on Lower Higham Road and be extracted from a site just north of the North Kent railway line and the Thames and Medway Canal adjacent to the Metropolitan Police Firing Range in the marshes. The boring machine would need to be dismantled and taken out via the tow path, Canal Road, Ordnance Road and the A226 east.

11. As a result of the tunnel extension, the access link road from the A226 (for maintenance and emergency access only) is extended in length. A footbridge over the cutting has been deleted (which raised safety concerns) so that the footpath connections now run over the tunnel portal. An circular access road as before runs from the Thurrock bound carriageway over the tunnel portal and back to the southbound carriageway for maintenance and emergency access purposes. There would also be a removable barrier between the carriageways. A general location for a building is shown for tunnel control systems above the portal, although normal control of these will be from elsewhere. In the event of a major emergency the building provides a base, if required, for the emergency services.
12. A side product of this change is that the LTC alignment has been straightened with a resulting impact on the back (from Thong Lane) of the Cascades Leisure Centre site, where the pitch and putt course is located. A suggestion is made that this facility could be relocated on some of the land currently occupied by the Southern Valley Golf Course. The basic design of the cutting remains as before.
13. The cutting produces a substantial volume of chalk spoil which needs to be disposed of. Chalk spoil can be used for landscaping but is not strong enough to act as structural fill. The proposed Chalk Park uses about 1m cu³ of spoil from the cutting and another 350,000 m cu³ is proposed to be stockpiled east alignment for movement after the completion of main construction. No destination is specified for this spoil, but lowering the depth of the Blue Lake at Northfleet is an option. Tunnel spoil from main bores of the Thames Tunnel comes out on the north side of the river. See further below for information on lorry movements.
14. The Thong Lane land bridge north was 60m wide and is now proposed to be 80m to make it able to carry Thong Lane itself, new footpaths, utilities and landscaping over the LTC. There are significant alterations as a result of utility diversions, which are discussed further below. Thong Lane itself is shown as following follows a more sinuous course. The 400 KV overhead power line and high pressure gas mains also get a diverted in this area and at Claylane Wood where the proposals have been amended.
15. At Thong as a result of the utility diversions three residential properties will be demolished, two of which are London County Council houses built after the 1st World War (Homes for Heroes) in the Conservation Area. Also lost will be a landscape business. In the 2018 consultation the business and one home had their access altered, and the other two properties were not directly impacted at all.
16. The design of the A2 junction has been changed as a result of moving the tunnel portal and a desire to make it more compact. There were concerns over the radii of some of the slips roads from a safety point of view. The main functional change is a west to east slip so that traffic from Marling Cross (Gravesend East) can access the M2 coastbound. The previous arrangement of a connection from the A289 parallel road onto the M2 east of Brewers Road was judged not to be

- safe. As a result of this for traffic from Marling Cross there is no direct connection to the A289. For access it is necessary to go along the local link road on the south side, over the Brewers Road bridge and use the junction that currently connects onto the A2. The junction of the slip roads to the A289 on Brewers Road acquire traffic signals.
17. It is suggested in the consultation that traffic from Cobham and Shorne that wishes to gain the M2 coastbound will need to go along the A289 to the Higham Junction and then come back. The other option is to use the local road connection to Marling Cross to the west, which is how access to the LTC itself would be obtained.
 18. Approaching along the A2 from Tollgate going coastbound the driver will have four route options (the road numbering referring to where the route is going not what it may or may not be designated as):
 - i. Exit at the Marling Cross junction (for Hever Court Road, Valley Drive, Cobham and Sole Street etc.)
 - ii. Exit onto the LTC north to Thurrock
 - iii. Exit to the A289 Wainscott Bypass (and A2 Watling Street into Strood)
 - iv. Continue on the M2 which is now shown as two lanes through A2/LTC junction east bound (three in 2018) and three lanes westbound as before. Note the M2 becomes 4 lane once the LTC slip have joined.
 19. The red line boundary for the LTC scheme now extends west along the A2 to allow for the signage that will be necessary to ensure traffic gets in the right lanes approaching Marling Cross.
 20. Marling Cross Junction becomes a gyratory system over the A2, with a widened bridge (from 19m to 24m), and two sets of traffic signals, north and south of the A2. The practical impact is that drivers wishing to go from Valley Drive to Hever Court Road will have to go over the A2 and then come back after having been through two sets of signals. On the south side there is a link from LTC westbound slip into the gyratory as well as the A2 eastbound.
 21. There are two further roundabouts along the local link road. The first (going east) serves Henhurst Road, the Singlewell Infrastructure Maintenance Depot and the HS1 Electricity feeder station (with potential large load access across the roundabout for when transformers need replacing). The second serves connections off the westbound M2 and A289. All residential properties in this area are demolished as before.
 22. The 2018 design showed box structures for the various slip roads and A2 crossing each other. The current plans show viaduct and bridge structures whilst the tunnel under the A2 has been reduced in length.
 23. At Cobham/Shorne the on/off slips to the A2 that currently exist on the south side of the A2 to/from the Halfpence Lane/Brewers Road roundabout are deleted. To reach this area (for example to access to Cobham Hall or Ashenbank Wood car park) it will be necessary to take the use Marling Cross junction or other slips onto the local link road from the M2/A289 and go back east. Access from Marling Cross is via the link road.

24. The tables and plans in the consultation (Guide to Supplementary consultation 5-1 to 5-10) includes links that require U turns and junctions which may be true in the sense of the connections exist, but is clearly not satisfactory from the point of view of the user. Table below illustrates some of the changes.

To	Current	Future
From: Shorne Woods Country Park		
A2 Westbound	Brewers Road bridge and slip road onto A2	Brewers Road bridge and local road to Marling Cross junction
LTC	n/a	Brewers Road bridge and local road to U turn at Marling Cross junction
A289 Eastbound	Brewers Road slip onto A2	Brewers Road slip onto A289
M2 Eastbound	Brewers Road slip onto A2	Brewers Road slip onto A289, U turn at Higham junction
From: Marling Cross Junction		
LTC	n/a	Slip road to LTC north
A289	Slip onto A2	South side of Marling Cross junction, local link road to Brewers Road and then slip onto A289 eastbound
M2	Slip onto A2	Onto LTC slip then onto M2 slip
Shorne Woods Country Park	Onto A2 and exit to Brewers Road	Onto A289 and exit to Brewers Road

25. Brewers Road bridge itself has to be rebuilt in situ and has been amended to avoid altering existing HS1 structures. Thong Lane south bridge is widened from the existing 16m to 30m but can be built offline. Through the AoNB the combined width of highway has been reduced by narrowing some lanes and removing any landscaping in the central reservation. Map Book 3 contains an illustrative cross section.
26. Changes to the public rights of way network can be divided into those to the north of the A2 and those to the south. To the north the links have been focussed around either the Thong Lane Bridge or over the tunnel portal as a result of its extension south. In simple terms routes NG7 and NG9 go over the tunnel portal, whilst NG8 (which runs NW through Southern Valley Golf Club) for the most part disappears under LTC. NS 169 (from Michael Gardens) and NS 167 (from Marling Cross) to Thong are diverted by new routes to the Thong Lane land

bridge. NCR177 along the northern edge of the A2 is largely lost as before, except the section along Park Pale.

27. It is proposed to divert NCR177 south of the A2 via two options. Firstly from the eastern Hares Bridge over the A2, east across Jeskyns, north up Scotland Lane (NS195), along a new link through Ashenbank Wood just south of HS1 to Halfpence Lane. From there are the option to go over the new Brewers Road bridge and join Park Pale or an upgraded link just south of HS1 through Cobham Park to Park Pale (south). When the local link road is complete there will also be a connection along that as well.

Utilities and construction

Utilities

28. The A2 contains a large number of services (gas, water, electricity, fibre optic cables etc.) running beneath it, mainly along the northern edge (see Utilities Update p.10-19). The location of these were a major driver when the A2 was widened to 4 lanes and moved to the south of Northfleet/Gravesend in 2007. The old A2 corridor became NCR177 with the services remained in place beneath it.
29. The introduction of LTC requires that all the services along the A2 between Marling Cross and Thong Lane be moved because of the many structures, slip roads and multiple levels that the new junction involves. The rebuilding of the A2 east of this point also necessitates some changes due to the increase in the number of lanes.
30. The utilities along the northern edge of the A2 are complicated by a 900mm gas pipeline that passes beneath the roundabout at the top of Valley Drive and along the northern edge of the A2. It then goes under the central reservation and the London bound carriageway, before coming back to the north side. It is surprising that given the rebuilding that has occurred on this section with CTRL (HS1) and the A2/M2 widening, and the subsequent A2 widening that this has not been moved before. The alignment seems to relate to the route of A2 in the 1950's.
31. The project has developed a number of approaches to dealing with the utilities and is still working these through with the relevant statutory undertakers. Current rules on access and separation have to be met, and in particular there are issues with what other services can be near gas pipes. Long term access is particularly important as the statutory undertakers have the right to gain access to their plant should they need it at any time. This has implications of any planting (whether new or existing), a road, or other facilities located over them. The proposals as presented in the consultation represent the maximum extent that may be needed and have been taken on the basis that they will be implemented as such. The DCO will contain refined proposals with potentially reduced impact, but this cannot be assumed at this stage.
32. The proposed diversions of the 400 KV lines and the high pressure gas pipelines remain broadly as proposed in 2018. At Claylane Wood two temporary pylons to the east will be required whilst a new 75m pylon is constructed. At Thong Lane a temporary pylon will be needed whilst three pylons built and two removed. The aim is for utilities to cross the new road as far as possible at right angles to it.

33. On the A2 the objective would be to keep as much as possible of the services in the HS1/A2 corridor, except at the junction where this is not possible. The gas main diversion proposed would run north to Thong and then back south to Inn of the Lake before running east. This would intrude into Shorne Woods Country Park and Brewers Wood, which are both Ancient Woodland and SSSI's. Provision is however also being made for some of the services to run south of HS1 by crossing A2/HS1 at Marling Cross to the west side of Henhurst Road. Using trenchless technology, they would then run under Jeskyns to a point south of Ashenbank Wood where they would run north or north east to regain the A2 corridor. The trenchless technology involves boring a small tunnel and then inserting a pipe through it to contain the utilities. This pipe has to be welded together above ground before being threaded through. This explains the star shape of the red line boundary south of Ashenbank Wood towards Cobham (the lay out areas being temporary).
34. There is also the possibility of a utility diversion via Cobham under Henhurst Road, Jeskyn's Road, The Street and Halfpence Lane, hence why these roads are included in the red line boundary. A route from the tunnel portal area under the A226 via Higham is also now included in the safeguarding. There is also a proposal for a new electricity cable to run under the old A2 from Pepper Hill (Northfleet East Substation) to Marling Cross and then down LTC to tunnel portal. This will be used to supply construction activities in the short term and in the long term feed tunnel systems, and also be able to augment supplies on the east side of Gravesend.
35. A permanent electricity substation would be required somewhere on the A226 Rochester Road at either at Chalk, more or less on top of the LTC tunnel, or near Church Lane. This would require a site 50m x 50m site, which to give a sense of scale is roughly half the size of the HS1 electricity substation.

Construction Sites and access

36. The two main construction sites south of the Thames are around the tunnel portal off the A226 Rochester Road, and just west of Thong Lane and north of the A2 (see Utilities p15/16 and Guide to Supplementary Consultation Sec.7). The former serves the tunnel works and cutting whilst the latter supports the works along the A2. There would be a haul route linking the A2 with Rochester Road (A226).
37. There is a small construction site at the former Marling Cross Lorry Park, which is already used, with planning permission, to support various ongoing surveys. There are two new sites proposed on the Lower Higham Road and just north of the North Kent Line and Thames & Medway Canal in the marshes on the tunnel alignment. The latter is on the edge of the Metropolitan Police firing range (see below for an explanation of their purpose).
38. Access to all these sites will be off A2 using initially highway that was provided for Cobham North services when the A2 was widened, but then closed. This was designed with access off the Marling Cross east facing slip, though it is not clear how construction traffic would reach it given that the area is likely to have extensive traffic management. Vehicles coming from further east would need to go through the junction and perform a U turn.

39. Traffic leaving the site would need to join the A2 (with traffic management) and either take the A289 and do a U turn at the Higham junction or go down the M2 and use Junction 2 at Cuxton. A third possibility would be to go to Three Crutches on the A2 and use the roundabout which is unlikely to be acceptable.
40. The A2 will have traffic management on it with speed limits and narrow lanes to cope with lorry movements and the construction activities required to be build the new roads and their associated structures.
41. A haul road would link the A2 to the A226 for construction traffic, and then reach the A289 Wainscott bypass through Higham. Lower Higham Road would need access via Lion Roundabout and A226. The marshes construction site would need access via Canal Road, Ordnance Road and A226. Neither of these will be big generators of traffic compared to the main sites.

Construction

42. It is important to note that proposals for construction process are based on the current assessment of what is needed. As further surveys are carried out, the design evolved and in due course through contractor engagement, these will change. The proposals in the DCO as submitted (assuming they are permitted with any amendments) will provide an envelope within which they have to work. The DCO will be accompanied by a Code of Construction Practice (CoCP) which forms part of the application. The contractors will then produce and submit for approval Construction Environmental Management Plans (CEMPs). These all have to fit within impacts as assessed in the Environmental Statement (in the jargon the 'Rochdale envelope'). Any proposal outside this would need an amendment to the DCO, which can be done but is not a simple process.
43. It is important that the Borough Council and County Council (as Transport Authority) have from the DCO sufficient controls to ensure that the impacts are minimised and can be enforced. A scheme of this scale cannot be constructed without major disruption. It is important in environmental impact terms to distinguish between short term construction impacts and the long term impacts of the scheme. 'Short' in this context means 6 years with as noted above some spoil disposal stretching into the period after completion. Thus construction impact will be highly significant in both terms of noise, dust and potential disruption to the highway network.
44. The proposal remains for the two road tunnels to be bored from Thurrock (16m diameter), with a large construction site at the northern portal. North of Thong Lane a deep cutting will need to be excavated to receive the tunnel boring machines as well as to accommodate the road itself. This cutting produces a very large amount of spoil.
45. A new proposal is for a 'small' (=5.8m) bored tunnel to be driven in the opposite direction of the main bores coming from Thurrock as noted above for ground stabilisation works.
46. The entire A2 between Marling Cross and Three Crutches (M2 J1) is going to be rebuilt with a substantial number of bridges and other structures. Significant disruption is therefore likely together with night or weekend closures. The best current local example is such works is on the M20 from J3-J6, which is only to convert the hard shoulder into a running lane, though has involved some bridge demolition.

47. Brewers Road bridge needs to be rebuilt on the same alignment as at present (due to the constraints of HS1 structures) so is likely to be shut for a significant period (12 months has been mentioned), posing issues for access to both Shorne and Cobham villages, and Shorne Woods Country Park. What is happening on the A2 in terms of traffic management, overnight and weekend closures etc. will potentially have a very significant impact on local roads. The implications of rat running in both the urban and rural areas are well known from practical experience today from the frequent congestion on the A2 in the peaks. An unknown will be how much traffic will divert onto the M20 corridor if that is a more reliable route, depending of course on the actual trip origin and destination.
48. Thong Lane has two new bridges, one over the A2 and one over LTC. Both are on new alignments so in theory at least can be built off line, and then traffic diverted onto the new structures. In the case of Thong Lane north land bridge solid ground, with a diverted road, can be left until the new land bridge is complete.
49. No specific information is available about impacts on footpath, bridleway and cycle ways, although logically some or all of these will be closed and diverted during construction as the network undergoes significant alteration. NCR177 is highlighted as a particular problem because of the construction works, hence the alternative routes discussed above.
50. As a result of changes in design and further work on the construction process the number of lorry movements projected has been significantly reduced compared with the figures given in the 2018 consultation. How this translates into actual movements on the ground and their impact on the highway network and local residents (particularly those at Thong and the edge of Riverview Park) is another matter. It is understood that the project is carrying out detailed traffic modelling of the proposed construction programme (which the Council does not have) and therefore the traffic movements that result. This needs to cover workers and servicing trips as well as the more obvious HGV movements.

Construction Area	2018 average number of journeys/month	2020 average number of journeys/month	% change
A2 construction	4,700	2,900	-38%
Tunnel portal south	1,100	800	-27%

Transport Modelling

51. The Lower Thames Area Model created for the 2018 consultation has been enhanced and rerun with the junction alterations and various other changes. These are discussed further below after some further analysis of the 2018 work. Note that it is essentially a highway model and does not deal directly with public transport.

Analysis of previous modelling

52. In 2018 the detailed model flows were made available and subsequently a cordoned section of the full transport model has been released to the local

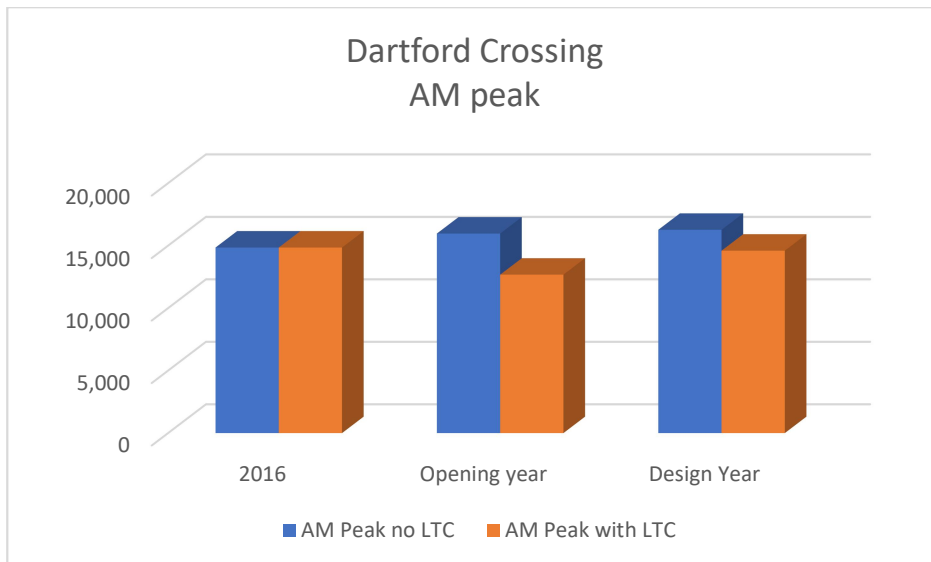
authorities. KCC employed consultants to analyse the model in detail to understand more fully what the issues were. This included looking at the 8-9 AM period which is the peak on the local roads, whereas the model uses 7-8 AM which is the peak for the strategic network. This analysis is now out of date in the sense that it relates to the older model and highway design. That said it gives an indication of areas of concern and the new modelling does not produce at strategic level very different results. The brief was to look at implications of the LTC for both strategic and local roads. The cordon version supplied did not include most of the Medway Towns so may not show some issues that are relevant to Gravesham. As was noted in 2018 the model was primarily validated on the strategic network (its prime function) and relatively little attention paid to the local network.

53. On the strategic network the following main points can be made:
- i. Relief to the Dartford crossing at opening but this gets steadily eroded by 2041 (now 2042)
 - ii. Relief to the A2 west of LTC junction as trips seeking to go north are diverted
 - iii. Relief to the M20 west of J6 for the same reason
 - iv. Congestion on M2 J1 - J3 (Three Crutches to Bluebell Hill)
 - v. Congestion of A229 (Bluebell Hill) – note this is at M2 J3 and M20 J6 junctions rather than the road link itself
 - vi. Congestion on A228, especially from Halling northwards plus at M2 J2
54. On the local roads:
- i. Some concerns on A227 – in the southern part of the Borough but also at Tollgate junction
 - ii. Hall Road roundabout (Pepper Hill) – however it should be noted that this area is sensitive to the development assumptions used for the Ebbsfleet area where the existing planning permissions have been used. The A2 Bean and Ebbsfleet junction improvements are allowed for but not the possibility of the London Resort.
 - iii. Cobham/Sole Street - but note the new junction design has a direct impact on traffic flows in this area. This needs to be analysed in more detail and there is local concern that existing traffic flows are understated.
 - iv. Thong Lane - some increase in traffic but again the change in junction arrangements may alter this)

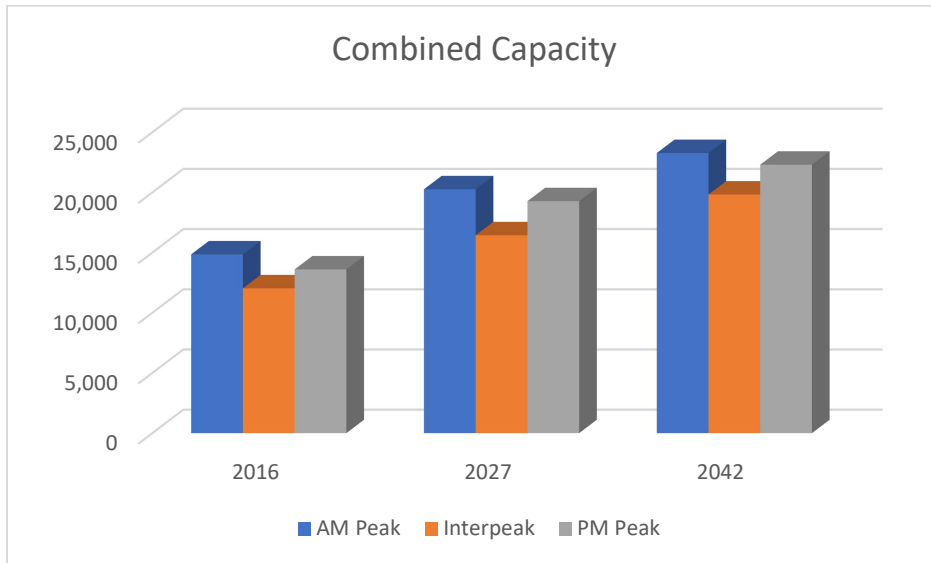
Updated modelling

55. New modelling for the LTC is summarised in the Traffic Modelling Update consultation document. This contains diagrams showing changes to flows but the detailed results are not available to the Local Authorities yet. Peter's Bridge in Halling was missing from the original model (having only just opened so there was no flow data) and has now been included, as are an updated list of new road schemes that are expected to be implemented by the forecast years in the model. The opening year has been updated from 2026 to 2027, and the design year from 2041 to 2042.

56. HGV data has been significantly revised in the light of new data from the Department of Transport. Various other changes have been made to reflect the latest data or forecasts from a variety of sources. The development schedule has been updated on the basis of information from the relevant Local Authorities but 'growth associated with government housing targets which have not yet fully progressed through the planning system is not included'.
57. As before as well as using 2016 data to validate the model, runs have been made with the development and network changes with and without the Lower Thames Crossing. Note that the model works in PCU's (passenger car units), where an HGV is equivalent to 2.5 pcu's. Diagrams show the changes in flows between the previous and current models as well as the impacts on the opening year between with and without the crossing for the AM peak (7-8), Interpeak and PM peak (5-6) for 2027. Very little information is presented for the design year of 2042.
58. At the Dartford Crossing the LTC provides at opening a reduction in traffic of the order of 15-16% depending on the time of day. However, by 2042 this gain has effectively disappeared, as shown in the graph below for the AM peak. Without LTC there is very little growth since the current road is operating at capacity.



59. The new crossing creates additional capacity across the river. In the graph below 2016 only covers Dartford Crossing whilst 2027 and 2042 include both links. The combined effect is to allow increased flow by 2042 by 22-30% depending on time period during the day. In break down, 60-63% traffic is at Dartford and 37-40% traffic is at the new crossing (all figures in PCU's). There is an increase in HGV traffic on the Dartford Crossing but it is not clear whether this is development driven (permissions for distribution warehouses) or the result of other factors.



60. The maps in the consultation document show the changes in flow brought about by the new crossing which confirm the broad pattern discussed above. That is lower flows on Dartford Crossing, A2 west of LTC junction and M20 west of J6, but increased flows on M2, A228 and A229. This applies to a great or lesser extent across all time periods.
61. In percentage terms there are significant increases in flow on Bush/Cobhambury Roads into Cobham, decrease on Halfpence Lane and The Street, and an increase on Jeskyns and Henhurst Roads. The capacity mapping does not show any issues. Given the deletion of the Cobham slip roads it is logical that Halfpence Lane has a drop in flow, however it also seems that traffic is diverting from A229/A228 via Cuxton presumably to avoid congestion on that section of the M2. There are other similar changes on roads in the Shorne/Higham areas and east side of Gravesend. Detailed data is needed to understand what the model is predicting, and how far the model reflects the reality on the ground (e.g. neither The Street, Cobham nor Thong Lane, Thong are two-way roads in parts).
62. As before the analysis has been carried out to meet Green Book Treasury rules which all such projects have to do. There is no objection to that being done and it provides in essence as minimal impact base line. However this project is undergoing environmental assessment and that requires the analysis to be “undertaken using a realistic ‘worst case’ scenario” (para 4.17.5 Design Manual for Roads and Bridges LA104 Environmental Assessment and Monitoring July 2019). There is of course scope for debate about what constitutes a ‘worst case’ in particular circumstances.
63. Local Planning Authorities are under an obligation by the Ministry of Housing, Communities and Local Government to meet their objectively assessed housing need, for which it provides the data as to what that constitutes. The Local Plan process may result, depending on circumstances, over or under provision. Jobs also need to be taken into account since their location in relation to the housing has major implications for traffic flows. There is no simple formula for looking into the future (which is any case has to be multi-modal to take account of public transport usage) so a discussion is needed as to what constitutes a reasonable ‘worst case’ in these circumstances.

64. To take two examples as far as can be told the implications of the £170 Housing Investment Fund from Ministry of Housing Communities and Local Government to Medway Council for housing development at Hoo has not been taken into account. This development would feed directly onto the A2/M2 junction via the A289, and therefore in the future LTC, and has to be regarded as a material consideration. For Local Plan preparation purposes Highways England have indicated that an OAN based option(s) should be tested. Not included in the modelling is the possibility of London Resort, as it is not yet clear precisely what travel flows this large unique project would generate, so it is difficult to model.
65. It remains true, as was said in 2018, that the transport modelling has not included sufficient development to allow the full implications of the Lower Thames Crossing to be understood, and therefore what additional alterations might or might not be required to the highway network. Without this it is not possible to assess the environmental impact in a robust way.

Environmental Assessment

66. The Environmental Impacts Update (EIU) document takes as its base the Preliminary Environmental Impact Report produced in 2018. The Borough Council made clear in 2018 that taking into account that is preliminary and is not (or intended to be) a full environmental assessment, that document did not contain sufficient information to allow consultees to arrive at informed views. This flaw has not been addressed and is therefore carried forward into this consultation.
67. Given the short timescale (6 weeks plus a 1 week extension for the consultation overall, even shorter to prepare this report) it has not been possible to analyse the document in detail, but rather it has been taken as a general guide to how the project sees the impacts developing from the changes. These may be of course negative or positive impacts. That said it is possible to arrive at some general conclusions over the impacts from the proposed changes. The bulk of the scheme is of course in outline the same or very similar to 2018 so in that sense not a great deal has changed. Some of the changes (e.g. tunnel extension) are positive and to be welcomed.
68. As discussed above the traffic modelling has been updated, but there is no additional information on air quality or noise which is directly related to vehicle flows. Without more detailed data it is also not possible to fully assess whether the changes made improve or not traffic conditions (and therefore potentially noise and air quality) around the scheme or elsewhere on the network.
69. The comments below use the major changes listed in para 8 as a basis. They do not cover outstanding issues from the 2018 Statutory Consultation. Due to the relative lack of information in the consultation on the potential impacts as opposed to a view on their significance, the comments may inevitably raise issues which might turn out not to be significant on detailed analysis (or miss those that are). By default the precautionary principle has to apply, especially where very sensitive receptors (people, habitat, landscape, heritage etc.) exist.
- i. South to north ground preparation tunnel – this raises major issues due to the implications for the SSSI/Ramsar/SPA from both the physical process involved (injecting alien materials into the ground and back filling) and extraction of the tunnel boring machine. The potential impact on water

tables, and therefore the habitat for wading birds, could be significant. The EIU asserts that the hydrological impact from construction and operation (i.e. LTC when built) has been modelled and would 'not be significant'. Without any evidence this has to be taken as a serious risk, especially at the point where the boring machine is extracted. RSPB has confirmed that the management of the marshes as a habitat is a delicate process.

- ii. Tunnel portal construction site - the additional proposals for local spoil disposal reduce the traffic impacts but raise concerns over noise and dust and long term management. The stockpile approach means that the potential impacts continue well past the general completion of construction. There are complex interactions in this area between the various land uses which require further study. The functions and design of Chalk Park need to be addressed in the wider context of the land on the east side of Thong Lane and the implications for the wider landscape. Electricity Feeder station - all three locations have pros and cons but without a full understanding of what this facility is, it is not possible to select a preferred location. Wherever it is will need landscaping and screening. The issue of the properties and caravans on the south side of A226 Rochester Road has not been addressed both from the construction process and the substation.
- iii. Tunnel extension – in broad terms this is to be welcomed and represents a gain of 950m over the original 2016 proposals as noted above. It also reduces the volume of spoil from the cutting since the material excavated in the tunnel goes north to Thurrock.
- iv. Public Rights of Way (PROW) network changes – in very broad terms these look logical from the point of view of the moving the tunnel portal. However, it is not clear what the legal status of the various proposed links is and how they relate to the wider network. Especially in the Thong area they result in extended journeys in what will inherently be a more disrupted setting. The existing A2 provides significant noise and visual intrusion in this area but the 'envelope' of this is significantly extended by LTC. The plans in the Guide to Consultation (p.89 & 90) do not make clear what PROW are being lost, e.g. NG9 from Thong Lane to Rochester Road.
- v. Planting proposals – there are changes suggested in the planting proposals with less woodland seemingly suggested than hitherto, some of which is in response to previous comments about the historic landscape setting of Thong village. There remains a basic issue that it is not clear what the landscaping/planting proposals are mitigating for or whether they are in compensation for impacts that cannot be mitigated. There is no information on how the various agricultural units are impacted and how far they remain viable (or not) from the scheme's proposals.
- vi. Thong Lane land bridge – the widening is to be welcomed though fuller understanding will be required of the detailed design of the highway (to discourage rat running), the PROW links and the habitat elements, and how they all relate to the land uses around them. Further widening would be welcomed to reduce further reduce the impact on local residents.

- vii. Loss of residential properties and a business at Thong represents a significant impact on both those directly concerned and in the case of the LCC built properties, the conservation area. The historic environment in this area was already under considerable stress from the proposals which forms part of the wider Cobham Hall Estate.
- viii. Although the need for working space for utilities diversion is noted and understood it is not clear what the rationale is for the new wider area of planting at Ifield (which has implications for the setting of Ifield Church (Grade II)). The same comment as in (vi) above applies.
- ix. The more compact junction is to be welcomed in principle, as is the use of bridges/viaducts rather than box structures. There are however no cross sections of the junction so it is hard to assess what its impact is on the landscape setting of the AoNB or on the north side the residents of Valley Drive/Riverview Park residential areas. Without detailed traffic modelling information it is hard to assess how far the design meets its highway objectives. The suggestion of the M2 being 2 lanes eastbound through the junction is at first sight implausible given the existing flows on this part of the network. In the opposite direction why does the off slip from the LTC to the local link road require 3 lanes? The new direct link is welcomed to M2 as something this Council asked for, though the link to the A289 remains tortuous. A further question is how the landscaping in this area is going to be maintained as a series of small islands are created surrounded by slip roads (access to the current planted central reservation the existing A2 is difficult). It is not clear whether a safety audit has been carried out of the current proposals (including lane narrowing in the AoNB), which was an issue with the A289 eastbound to M2 slip in the 2018 proposals.
- x. This proposal has the advantage of moving traffic off Halfpence Lane, but the disadvantage of making access to Cobham and Cobham Hall more tortuous. The overall traffic implications need more work to assess and understand the net result.
- xi. The Council has taken further advice from its landscape consultant and the Kent Downs AoNB unit. The loss of any planting in the central reservation increases the urbanising impact of the proposals where the current arrangement achieves a much more rural feel. This impacts landscape of the Kent Downs AoNB and the setting of the registered park and garden at Cobham Hall. A cross section is provided in Map Book 3 which shows a central reservation that does not seem to accord with engineering drawings. It is illustrating about a 10-11m gap between the M2 carriageways, whilst the plans imply for the most part something narrower. It is not at all clear that this proposal has achieved anything to the overall benefit of the landscape, which includes the historic landscape of the wider Cobham Park. The project still needs to address the loss of HS1 landscaping here and further west. The potential impact of the utility diversions further add to the landscape impact in this sensitive area. The possible alternative of widening the corridor on the north side, especially in the context of the proposed utility diversions, needs further exploration.

- xii. Increased width is welcomed but could be taken further. The constraints at Brewers Road bridge are noted.
 - xiii. Utility diversions – great concern is raised about these since their existence should have been taken into account in the route selection process, and therefore throws up the concern whether the 2016 decision had the right information to make the choice. The implications for the SSSI, Ancient Woodland, landscape and historic setting of the area are unacceptable. Although trenchless technology is proposed this does not negate the right of the utilities to access their plant at any time and therefore remove whatever lies above. In particular it is noted that there are historic Sweet Chestnuts trees in Brewers Wood. Taking the Ancient Woodland specifically, paragraph 5.32 of the National Policy Statement on National Networks is clear that the Secretary of State should not consent to any unnecessary loss. For the utilities which can be moved much more easily over a wider area than a road or railway there is no case for loss of ancient woodland.
70. The implications of the proposals on nature conservation are significantly adverse given the additional large scale losses of habitat over the whole project. This is particularly acute where Ancient Woodland loss is involved.
71. On construction without some sort of overall programme, however draft, and further information it is difficult to say more than that this is an area of major uncertainty and potential impact. This is both from traffic on the wider network and more locally from noise, dust, disturbance, hours of working etc. on local residents. An illustrative issue is the possible impact on the operation of the Thamesview Crematorium both in terms of access and the environment it can provide.
72. The plans and documents will continue to be examined and further clarification and information sought. This appraisal is without prejudice to raising further issues as necessary. Equally additional information might allay some of the concerns expressed above.