

8th November 2019

By email only to: a417missinglink@highwaysengland.co.uk



Dear Sir / Madam

A417 MISSING LINK PUBLIC CONSULTATION

Thank you for consulting the Cotswolds Conservation Board ('the Board') on the A417 Missing Link Public Consultation.

The Board acknowledges that a scheme is needed to improve the 'missing link' section of the A417. We recognise that such a scheme would improve traffic flows and journey times and reduce congestion, air pollution and, most importantly, the number of accidents. Given that this section of the A417 is located entirely within the Cotswolds Area of Outstanding Natural Beauty (AONB), the Board further recognises that the proposed scheme could not be implemented outside this designated area.

We very much appreciate Highways England's positive engagement with the Board and other key stakeholders. The Board has taken – and continues to take - a pro-active role in supporting and helping Highways England to enhance and refine the proposed scheme. For example, the Board has:

- played a key role in instigating and developing the agreed 'landscape-led' approach, in particular, the associated vision, design principles, objectives and sub objectives;
- put forward the proposed option for the A436 link road, which performs better, both economically and environmentally, than the other two link road options that are referred to in the consultation documents.

The agreed landscape-led approach is particularly important because the whole of the Cotswolds AONB is an area whose distinctive character and natural beauty are so outstanding that it is in the nation's interest to safeguard it. This landscape-led approach is given further weight by the fact that the Government-commissioned 'Landscapes Review' of National Parks and AONBs recommends that the Cotswolds AONB '*stands out as a leading candidate*' for National Park status.

The Board's statutory purposes require us to consider, when reviewing the proposed scheme, whether it:

- (i) delivers the agreed landscape-led approach, including the agreed vision, design principles, objectives and sub objectives (and provides the best practical option for doing so);
- (ii) sufficiently avoids, mitigates and moderates adverse effects – and further enhances the natural beauty of the AONB and public enjoyment of it - where possible;
- (iii) is fully consistent with the letter and spirit of relevant legislation and national policy.

Key consideration (i): Delivers the agreed landscape-led approach

One of the design principles for the agreed landscape-led approach is that '*any scheme must have substantially more benefits than negative impacts for the Cotswolds AONB*'.

Conserving, enhancing, understanding and enjoying the Cotswolds Area of Outstanding Natural Beauty

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This principle closely aligns with the Government's '25 Year Environment Plan' aspiration to embed a '*net environmental gain*' principle for development. We note that the Preliminary Environmental Information Report (PEIR) does not provide a comprehensive assessment of the overall balance of adverse and beneficial effects. Rather, it only indicates that '*there will be a mix of adverse and beneficial effects*'.

We appreciate that there is still a large amount of data that needs to be collated and assessed and that, as such, it is not currently possible for Highways England to clearly demonstrate that the proposed scheme delivers the agreed landscape-led approach.

The Board recognises that the proposed scheme could potentially have a number of beneficial effects, in addition to the key transport and traffic benefits outlined above. These include:

- the recreational opportunities provided by the re-purposed A417;
- the improved crossing of the A417 for the Cotswold Way National Trail;
- the proposed reduction of traffic intrusion along the Cotswold escarpment; and
- the proposed habitat creation.

However, we are also of the opinion that some of the potential benefits of the scheme may not be as significant as the consultation documents imply. For example, whilst the Board recognises the potential benefits of a green bridge, we consider that Highways England's green bridge proposals are unlikely to deliver the desired ecological and landscape benefits.

It is also the Board's opinion that the potential benefits of the proposed scheme could potentially be outweighed by significant adverse effects, resulting in substantial net harm to the Cotswolds AONB. These include:

- the adverse effects associated with creating a 1km long and 25m deep cutting through the Cotswold escarpment;
- the large quantities of material that would need to be extracted and disposed of as a result of this cutting;
- the construction of the new roads across the High Wold;
- the proposed infilling of the head of the Upper Churn Valley at Shab Hill Junction and the consequent raising of the junction above current ground levels.

On this basis, the Board is of the opinion that key consideration (i) has not yet been adequately addressed.

Key Consideration (ii): Avoids, mitigates and moderates adverse effects and further enhances the natural beauty - and public enjoyment - of the Cotswolds AONB

The Board has previously put forward a number of proposals that could potentially help to avoid, mitigate and / or moderate adverse effects. Crucially, they could also potentially help to further enhance the scheme. Key proposals have been incorporated into the Board's recommendations below.

The Board considers that it would be appropriate for Highways England to thoroughly consider these recommendations and to provide clear justification for how they propose to address them. We consider that this would be an essential component of demonstrating that key consideration (ii) has been adequately addressed.

Key Consideration (iii): Fully consistent with the letter and spirit of relevant legislation and national policy

Highways England has a statutory duty to have regard to conserving and enhancing the natural beauty of the Cotswolds AONB (the ‘duty of regard’). The expectation of this duty is not only that adverse impacts will be-avoided, where possible, but that opportunities will also be taken to enhance the natural beauty of the AONB.

National policy relating to nationally important road projects (such as the A417 Missing Link scheme) sets out a number of requirements that Highways England must address. These include considering:

- the extent to which adverse effects could be moderated;
- the scope for meeting the need for the scheme in some other way;
- measures to enhance the environment.

The Board is of the opinion that, in order for the proposed scheme to be fully consistent with relevant legislation and national policy, including the points outlined above, key considerations (i) and (ii) would also need to be adequately addressed. This is not currently the case.

Summary

The Board recognises the urgent need for a scheme to improve the ‘missing link’ section of the A417. However, as outlined above, it is the Board’s view that the proposed scheme does not – at this stage, in its current form and with the information currently provided by Highways England – adequately address the Board’s three key considerations. On this basis, the Board has no option but to object to the currently proposed scheme.

To help Highways England overcome this objection, the Board would like to make a number of recommendations, which could make several significant improvements to the scheme as currently proposed, thereby achieving a variety of better outcomes at overall comparable cost.

These recommendations are provided in the context of the holistic approach that will be required to fully address the scheme vision, design principles and objectives in the context of national policy tests. The Board’s recommendations are outlined below.

The Board looks forward to working closely with Highways England and other key stakeholders to improve the scheme in a way that truly delivers a landscape-led approach.

Recommendations

The Board recommends that Highways England should:

1. Undertake a comprehensive, quantitative assessment of the overall balance of adverse and beneficial effects across all Environmental Impact Assessment (EIA) topics, both individually and cumulatively, taking into account the agreed landscape-led approach.
2. Give further consideration to the potential benefits and viability of having a cut-and-cover ‘tunnel’ structure instead of a cutting between Cold Slad Lane and Shab Hill Junction. [N.B. It is important to note that, based on data provided in the consultation documents, the Board has calculated that the cost of a cut-and-cover structure for

this section of the scheme is likely to be broadly similar to - or only slightly greater than - a cutting.]

3. Give further consideration to alternatives to infilling the head of the Upper Churn Valley at Shab Hill Junction (particularly if a cut-and cover structure and / or relocating the Shab Hill Junction become viable options) and to the wider adverse effects of excavating and disposing of large volumes of excavated material on site.

If the cut-and-cover option is shown to be viable and becomes the preferred option:

4. Review the relative merits of Alternatives 2 and 3 for the A436 link road.

If the cut-and-cover option does not become the preferred option:

5. Give further consideration to having a green bridge that covers a considerably longer section of the A417 than currently proposed.

The Board's additional recommendations are for Highways England to give further consideration to:

6. Locating and configuring the proposed Shab Hill Junction a few hundred metres further north than in the current proposal.
7. Revising the layout and alignment of Cowley Junction.
8. Altering the alignment of the A436 link road to a lower contour line.
9. Replacing the proposed Birdlip – Shab Hill link road with a bypass around the south side of Birdlip that connects traffic to and from Stroud with a revised Cowley Junction.
10. Providing a more coherent narrative regarding the interactions between historic landscape character, habitats and wildlife, public access and landscape, and the implications of these interactions for a landscape-led scheme.
11. The cumulative effects, on the Cotswolds AONB, of the proposed scheme in combination with its forerunners in creating the Swindon to Gloucester Expressway (in line with PINS Advice Note 17).
12. Clarifying exactly how different areas of land within the 'red line' will be used (e.g. what will go where), during both construction and operation, and what the environmental effects of this will be.
13. Highlighting clearly the sheer scale of the proposed scheme in comparison with other major road schemes involving cuttings and / or tunnels.

If the recommendations outlined above are not progressed or implemented then, for those stakeholders who, like ourselves, have real concerns against our statutory duty, it does seem beholden on Highways England to provide robust justifications for their decisions.

We ask that this work is undertaken and the outcomes shared and discussed with key stakeholders, including the Board, well before the formal submission of a planning application.

To be helpful we have incorporated our recommendations, together with additional comments, in our responses to the questions posed in the Feedback Questionnaire. These responses are covered in Annex 1, below.

Conclusion

The Board remains committed to continuing to work with Highways England and their consultants in a constructive way, on an ongoing basis, in order to deliver a truly landscape-led scheme. We trust that Highways England will give full consideration to the Board's comments and recommendations as part of the scheme development process.

The Board fully appreciates the financial envelope that Highways England is operating within and the challenges that this presents for delivering the agreed vision, design principles, objectives and sub-objectives of the landscape-led approach. However, as indicated above, the Board believes that its recommendations will achieve a variety of better outcomes at overall comparative cost to the proposed scheme.

We look forward to discussing these matters in detail and seeing comprehensive, fully evidenced formal responses to these recommendations in due course.

If you have any queries regarding the Board's consultation response, please contact Andy Parsons, our new Chief Executive (full time from 1st December 2019) - andy.parsons@cotswoldsaonb.org.uk. Andy and I will be attending the A417 Strategic Stakeholder Panel meeting on 14th November and we very much look forward to continuing our dialogue with you at this time.

Yours faithfully,

A handwritten signature in black ink that reads "Elizabeth Eyre". The signature is written in a cursive, flowing style.

Elizabeth Eyre
Chairman on behalf of the Cotswolds Conservation Board

ANNEX 1. SUPPORTING INFORMATION FOR THE RESPONSE OF THE COTSWOLDS CONSERVATION BOARD TO THE A417 MISSING LINK SCHEME CONSULTATION

1. Do you have any comments on our proposed route from the Brockworth bypass to Shab Hill Junction?

Summary

The proposed route from Brockworth bypass to Shab Hill Junction is likely to have significant adverse effects on the Cotswolds Area of Outstanding Natural Beauty (AONB). In particular, there are likely to be significant adverse effects associated with the proposed cutting between Cold Slad Lane and Shab Hill Junction.

Based on the information provided in the consultation documents, the Cotswolds Conservation Board's ('the Board') own calculations (which have been provided by a highly experienced Chartered Civil Engineer) identify that the cost of a cut-and-cover 'tunnel' structure is likely to be broadly similar to - or only slightly greater than - the cost of a cutting.

In addition to being financially competitive, the cut-and-cover option would have a wide range of additional, significant benefits. For example, it would: significantly reduce the amount of 'surplus' excavated material; remove the need for - and cost of - installing a green bridge; further reduce landscape, visual and biodiversity impacts and pollution (noise, air and light); increase tranquillity; and enhance the experience of walking on the Cotswold Way National Trail.

The Board's key recommendation in relation to Question 1 (taking account of the financial envelope that so constrains Highways England) is to:

- Give further consideration to the potential benefits and viability of having a cut-and-cover 'tunnel' structure instead of a cutting between Cold Slad Lane and Shab Hill Junction and instead of a green bridge.

Supporting Information

The proposed route from Brockworth bypass to Shab Hill Junction is likely to have significant adverse effects on the Cotswolds AONB, at one of the AONB's most sensitive and well-visited locations. In particular, there are likely to be significant adverse effects associated with the proposed cutting between Cold Slad Lane and Shab Hill Junction. There are also likely to be significant adverse effects associated with widening the existing road footprint (from three lanes to five lanes) and with creating the new section of road between the Air Balloon and Shab Hill Junction on currently undeveloped land.

The new cutting would be approximately one kilometre long and up to approximately 25m deep, below the current ground level (which is more than the height of five double decker buses). Based on the 'Indicative Cross Section at Crickley Hill', the cutting will also be approximately 35m wide at road level (which is approximately equivalent to the full width of a motorway) and approximately 60m wide at the top of the cutting (i.e. nearly as wide as two motorways). The total width from the top of the slope on the north side (near the Cotswold Way National Trail) to the top of the slope on the south side, including the existing valley and the cutting, would increase from approximately 65m to approximately 102m.

Table 10-12 of the Preliminary Environmental Information Report (PEIR) shows that nearly 1.5 million cubic metres of raw material will need to be extracted along the proposed route. This is equivalent to:

- the volume of approximately 600 Olympic size swimming pools;¹
- ten times the volume of St Paul's Cathedral.²

Over half of this (837,332 cubic metres) would need to be taken off site. This is equivalent to:

- the volume of approximately 335 Olympic size swimming pools;
- the volume of St Paul's Cathedral x 5.5;
- 92,000 truck-loads (or 184,000 truck movements);³
- more than four times Gloucestershire's average annual output of Cotswold limestone.⁴

A comparison of the data in Table 10-12 with the current and proposed ground levels shown on the 'Mainline Plan and Profile' indicates that approximately two-thirds of this material (i.e. one million cubic metres – the volume of 400 Olympic size swimming pools) would come from the 1km long cutting between Cold Slad Lane and Shab Hill Junction.

These figures are based on a scenario the Board would class as 'optimistic' (i.e. the scenario shown in the 'Indicative Cross Section at Crickley Hill' on the 'Climbing the Escarpment Consultation Plan'). In this scenario, the ground conditions would be stable enough to allow for vertical walls up to 10m high on each side of the road in the cutting. Above these vertical walls, the cutting on the southern side of the road would slope at an angle of approximately 45° from the horizontal.

However, in reality, there is a significant risk that the slopes of the cutting will have to be very much shallower due to the instability of the geology of the Cotswold escarpment. For example, the 'Geology and Soils' section of the PEIR highlights the complexity and inherent instability of the escarpment geology, including the potential for rockfalls, the reactivation of ancient landslides and the potential effect of ground water on stability.

If further investigations demonstrate that the geology is less stable than in this 'optimistic' scenario, it may be necessary for the slope angles of any permanent open cuttings to be closer to 30° from the horizontal, rather than 45° from the horizontal, and without any vertical faces. In addition, there may be a need for horizontal benches to be constructed at intervals on the slopes in order to arrest any local rock falls and prevent rock from rolling down onto the carriageway.

This relatively 'pessimistic' scenario would result in a significantly wider cutting. For example, for the cutting shown in the 'Indicative Cross Section at Crickley Hill', the width of the top of the cutting would increase from approximately 60m, in the proposed 'optimistic' scenario, to over 100m (and the total width of the valley and cutting combined would increase from approximately 102m to approximately 140m). This equates to the width of approximately three motorways. As a result, the total volume of material that needs to be excavated and disposed of would also significantly increase. As such, the figures provided in Table 10-12 of the PEIR could actually be a significant under-estimate. This scenario

¹ Olympic size swimming pool = 2,500 cubic metres.

² St Paul's Cathedral = 152,000 cubic metres.

³ Assumes an average weight of 2.2 tonnes per cubic metre (for limestone), a capacity of 20 tonnes per truck and two movements per truck (i.e. arriving empty and then taking away a full load).

⁴ The 837,332 cubic metres of surplus material from the A417 scheme equates to approximately 1.84 million tonnes of limestone. According to the Emerging Minerals Local Plan for Gloucestershire, the 10-year rolling average of annual sales for primary land-won aggregates from within Gloucestershire (2007-2016) is approximately 1.45 million tonnes per annum. Approximately 30% of this is from the 'Cotswold resource area', which equates to approximately 435,000 tonnes per annum. Therefore, the amount of surplus material from the A417 scheme equates to more than four times this amount.

would also result in a range of additional significant adverse effects relating to landscape, biodiversity, noise, heritage, etc.

To put the scale of this cutting into a wider context, it is useful to compare it with other significant road cuttings in, or near, other protected landscapes. For example:

- The Stokenchurch cutting, in the Chilterns AONB, is a similar length (1.2km) but almost twice as deep (up to 47m) as the proposed scheme.
- The infamous Twyford Down cutting, close to the South Downs National park, is three times as long (3.2km), twice as wide (122m) and a similar depth (up to 30m) as the proposed scheme. Under the 'pessimistic' scenario for the A417 scheme, outlined above, the Twyford Down cutting would only be approximately 20% wider. In this scenario, the total width of the valley at the point where Cold Slad Lane joins the A417, would be approximately 140m, which is 18m wider than the Twyford Down cutting.

With regard to the widening of the existing road footprint from three lanes to five lanes up the escarpment, this is likely to increase the visual impact of the road and will also require the realignment of Norman's Brook, which could adversely affect the local hydrology / hydrogeology. Even where the road is in the cutting (as shown on the 'Indicative Cross Section at Crickley Hill'), the road would be more visible to key receptors, such as users of the Cotswold Way National Trail, than it is now.

In the short term, the widening of the road would require the removal of nearly all the trees and vegetation to the south side of the road and, based on the Red Line Area and the likely construction requirements, much of the vegetation on the north side.⁵ Although new vegetation is proposed to mitigate this impact, there will be a considerable period of time before this new vegetation becomes as well established as the current vegetation (and, therefore, before it provides equivalent - or improved - screening and filtering of views).

With regard to the new section of road between the Air Balloon and Shab Hill Junction, this new road would rise up approximately 40m between these two points over a visually prominent hillside, to the north-east of Emma's Grove. The fact that the road will be in a cutting could potentially help to mitigate visual impacts but the visual impacts may still be significant. In the vicinity of the Air Balloon, the cutting on the south side of the road is likely to be higher than the cutting on the north side, which could create a significant adverse visual impact for receptors at locations such as Leckhampton Hill. This new section of road would also result in the permanent loss of a small section of woodland at the northern end of Emma's Grove, which the PEIR identifies as being ancient in origin (although not formally designated as ancient woodland).

Cut-and-cover option

Based on the information provided in the consultation documents, the Board's own calculations (which have been provided by a highly experience Chartered Civil Engineer) identify that the cost of a cut-and-cover 'tunnel' structure is likely to be broadly similar to - or only slightly greater than - the cost of a cutting. This negates Highways England's previous

⁵ With regards to the removal of trees, hedges and other vegetation, it is worth noting RSPB advice which states that: *'We recommend not cutting hedges and trees between March and August as this is the main breeding season for nesting birds, although some birds may nest outside this period. It is an offence under Section 1 of the Wildlife and Countryside Act of 1981 to intentionally take, damage or destroy the nest of any wild bird while it is in use or being built, or to intentionally kill, injure or take chicks or adults, or intentionally take or destroy any eggs.'*

assertion that the cost of a tunnel would be significantly more than the cost of a cutting, which we suspect may have been based on their own guideline costs of bored tunnels.

These calculations are not included in this response (due to the significant level of detail that they go into) but the Board would be happy to share and discuss these calculations with Highways England.

In addition to being financially competitive, the cut-and-cover option would significantly reduce the amount of material that has to be extracted in the first place, as the temporary cutting that would be required could have steeper sides than for a permanent cutting. This option would also allow for a significant amount of extracted material to be re-deposited in-situ. It would, therefore, also reduce the amount of extracted material that has to be disposed of elsewhere on site and / or exported off-site (i.e. the 'surplus').

The Board's calculations estimate that the cut-and-cover option could potentially reduce the amount of surplus material arising from the 1km section that is currently proposed as a cutting by approximately 69%-75%. For example, in the 'pessimistic' scenario, outlined above, the amount of surplus material relating to this 1km section would be reduced from approximately 1.1 million cubic metres to approximately 270,000 cubic metres. For the scheme as a whole, replacing the 1km long cutting with a 1km long cut-and-cover structure could potentially reduce the total amount of surplus material by approximately 50%.

This option would also remove the need to provide a 'green bridge' - and the cost of installing and maintaining the green bridge - as it would provide all of the benefits of a green bridge (and more) over a much larger area. For example, it could increase ecological and landscape connectivity between Crickley Hill and Barrow Wake to a much greater extent than a green bridge.

The cut-and-cover option would have a wide range of additional benefits. For example, it would:

- Potentially reduce the need to fill in the valley at the proposed Shab Hill Junction, which is currently an area of calcareous grassland priority habitat and a key component of the landscape character of the Upper Churn Valley, and / or reduce the amount of material that has to be taken off site; this could then allow for the junction to be constructed (and / or the A417 to pass through the valley) at a less elevated level.
- Further reduce operational air pollution levels, including at Crickley Hill and Barrow Wake SSSI and at Emma's Grove.
- Further reduce operational noise levels. In particular, it could potentially reduce noise pollution at the Air Balloon cottages to below Significant Observed Adverse Effect Level (SOAEL). In this scenario, none of the four properties that are currently above SOAEL would remain above SOAEL.
- Reduce light pollution from vehicle lights at night-time.
- Reduce or avoid the permanent loss of the small section of woodland at Emma's Grove, which would occur with the proposed permanent, open cutting. This is because a new area of woodland could be created in this location, in mitigation, over the cut-and-cover tunnel after it has been installed.
- Reduce the amount of permanent land-take associated with a permanent open cutting and, therefore, reduce the area of land adversely affected by the scheme.
- Increase tranquillity along this section of the Cotswold escarpment and High Wold.
- Enhance the experience of walking on the Cotswold Way National Trail, the Gloucestershire Way and the rest of the Public Rights of Way (PRoW) network along this section of the routes.

- Allow the natural topography of the scarp and potentially much of the hill north and north-east of Emma's Grove to be reinstated.
- Facilitate a much improved and less intrusive alignment for the A436 link road while allowing for an improved location alignment and configuration of the A436 junction – see our response to Questions 4 and 3, respectively, for further details.

In addition, the route of the cut-and-cover structure could potentially be used for agriculture, the creation of appropriate priority habitats, enhancing landscape character and / or recreational uses, once the structure has been filled in.

An important consideration with the cut-and-cover option would be the extent to which the restored landform and topography should duplicate the current landform and topography. Previous 'improvements' in the section between Cold Slad Lane and the Air Balloon roundabout may have resulted in the landform and topography being altered. If this is the case, it may be appropriate for the restored landform and topography to reflect the 'pre-improvement' scenario.

In order to determine the most appropriate landform and topography, it will be essential to gain a detailed understanding of the historic route and how the landform and topography may have changed over time as a result of previous road improvements. A more detailed topographical assessment should be applied to the whole route.

The potential length of the cut-and-cover structure would partly depend on the location, layout and alignment geometry of the A436 junction (as discussed in response to Question 3 below) – these matters need further detailed assessment of achieving a fully integrated landscape-led solution.

In considering a cut-and-cover option, it would be appropriate for Highways England to review the best practice standards set for tunnels in protected landscapes and in other challenging scarps and ridges. Relevant examples include the tunnels at:

- A27 Southwick Hill (South Downs National Park);
- A20 Roundhill (North Downs AONB);
- Hindhead Common (Surrey Hills AONB / Wealden Heaths Special Protection Area);
- A505 Weston Hills, Baldock.

The Board's key recommendations in relation to Question 1 are shown in the summary, above.

2. Do you have any comments on our proposed green bridge?

Summary

The Cotswolds Conservation Board ('the Board') acknowledges that a green bridge could provide a number of potential benefits. However, we consider that Highways England's green bridge proposals are unlikely to deliver the desired ecological benefits.

The Board's key recommendations in relation to Question 2 are:

- If a cut-and-cover tunnel option is shown to be viable and becomes the preferred option (instead of the proposed cutting between Cold Slad Lane and Shab Hill Junction):
 - use the cut-and-cover tunnel option instead of a green bridge.
- If a cut-and-cover tunnel option does not become the preferred option:
 - give further consideration to having a green bridge that covers a considerably longer section of the A417 than currently proposed.

Supporting information

The Board acknowledges that a green bridge could provide a number of potential benefits and would certainly be better than an ordinary footbridge. In particular, providing a traffic free crossing across the A417 for users of the Cotswold Way National Trail and other recreational users would be a significant benefit. A green bridge could also potentially provide for some degree of connectivity, in terms of biodiversity and landscape, and allow for some habitat creation.

However, the Board considers that Highways England's aspirations for the proposed green bridge are unlikely to deliver the desired ecological benefits. The Consultation Booklet states that '*our proposed scheme would create new habitat links, including limestone grassland, new hedgerows, native scrub and trees in keeping with the character of the local landscape*' and that '*the green bridge would deliver a new wildlife corridor in the area*'. This level of 'habitat packing', where small areas of lots of different habitats are packed into a limited space, would not be appropriate, especially given that this space would also have to be shared with recreational users.

For example, the area created for each habitat might not be sufficient to provide a viable ecology or connectivity. Trees and habitats such as scrub might also out-compete and over-grow more sensitive habitats, such as calcareous grassland. Habitat packing would also require more intensive management, which could become costly in the longer term.

A significantly larger green bridge would be required to meet basic ecological and recreational benefits, but may still fall well short of contributing substantially to the net gain outcomes sought in the scheme vision, design principles objectives and sub-objectives.

In the context of the massive cutting that it would span, the limited scale of the green bridge falls well short of best practice standards established both within and outside internationally and nationally protected landscapes elsewhere in the UK. For example, the proposed A303 Amesbury to Berwick Down scheme, in the Stonehenge and Avebury World Heritage Site (WHS), includes a 3.3km to 3.55km bored tunnel and a 120m green bridge within the WHS, as well as three further 50m green bridges outside the WHS. In the Peak District National Park, an 18km tunnel is under consideration.

As outlined in response to Question 1, the Board has identified that the cost of a cut-and-cover 'tunnel' structure between Cold Slad Lane and Shab Hill Junction would be financially competitive, compared to a cutting, for this section of the proposed route. If the cut-and-cover option is considered viable and becomes the preferred option, there would be no need to install a green bridge. This is because the objectives of a green bridge could be met on the re-instated land covering the cut-and-cover structure. This option would also allow the objectives of a green bridge to be delivered over a much larger area, thereby providing significantly more benefits than a green bridge.

The Board's key recommendations in relation to Question 2 are shown in the summary, above.

3. Do you have any comments on our proposed route from Shab Hill to Cowley Junction?

Summary

The Cotswolds Conservation Board ('the Board') has three key concerns relating to the proposed route from Shab Hill to Cowley Junction. These are:

- the potential adverse impacts of Shab Hill Junction;
- the location of Shab Hill Junction; and
- the link road from Birdlip to Shab Hill Junction.

The Board's key recommendations in relation to Question 3 are as follows:

- Give further consideration to:
 - alternatives to infilling the head of the Upper Churn Valley at Shab Hill Junction (particularly if a cut-and cover structure and / or relocating the Shab Hill Junction become viable options) and the wider adverse effects of excavating and disposing of large volumes of excavated material on site;
 - locating and configuring the proposed Shab Hill Junction a few hundred metres further north than in the current proposal;
 - revising the layout and alignment of Cowley Junction (so as to avoid damaging the remains of the Roman settlement);
 - replacing the proposed Birdlip – Shab Hill link road with a bypass around the south side of Birdlip that connects traffic to and from Stroud with a revised Cowley Junction (thereby removing through traffic from the centre of Birdlip and potentially improving traffic flow).

Supporting Information

Constructing a completely new 3.5km long, 4 lane wide A-road across the undeveloped and highly sensitive High Wold landscape of the Cotswolds AONB will inevitably have significant adverse effects. The Board acknowledges that some of these adverse effects will be offset, to some degree, by the beneficial effects of closing and repurposing the existing A417 between the Air Balloon and Cowley Junction.

The Board considers that there are a number of ways in which the adverse effects of the proposed route between Shab Hill and Cowley Junction could be further reduced.–These primarily relate to Shab Hill Junction, Cowley Junction and the link road from Birdlip to Shab Hill Junction.

Shab Hill Junction – adverse effects

The Consultation Booklet states that *'placing the [Shab Hill] junction in lower-lying land will reduce the traffic noise in the wider area, and its visual impact from Barrow Wake and Shab Hill'*. However, the Board strongly challenges this assertion for the reasons outlined below.

The proposed Shab Hill Junction would be located in an area that is currently the head of a valley. The base of this section of the valley is approximately 20m or more below the land to

the north, south and west. However, analysis of the 'Indicative Cross Section at Shab Hill' in the 'Shab Hill to Cowley Junction Consultation Plan' shows that:

- the A417 at this point would be up to approximately 20m above current ground levels;
- the underpass, which connects the roundabouts on each side of the A417, would be up to approximately 10m above current ground levels;
- the proposed earthworks to the east of the junction would raise the ground level by approximately 20m.

So, rather than placing the junction in lower-lying land, as asserted in the Consultation Booklet, the proposed works would, in fact, install the A417 and all the Shab Hill Junction infrastructure in an elevated position, well above the current ground level. This seriously calls into question the supposed benefits relating to noise and visual impact.

Rather than utilising the natural contours of the valley to place the junction in lower lying land, it would appear that the natural contours of the valley are being used to provide a convenient location for depositing significant amounts of excavated material. The scale of these earthworks is re-enforced by the data in Table 10-12 of the Preliminary Environmental Information Report (PEIR). This table indicates that 441,301 cubic metres of excavated material would be deposited in the 1.62km long section of the route between Ullen Wood and Stockwell Farm (i.e. between 'chainage' 2420 and 4040). This is equivalent to the volume of 177 Olympic sized swimming pools (or nearly three times the volume of St Paul's Cathedral). The vast majority of this material would be deposited into the valley, which is approximately just 150m wide from north to south, where it would be crossed by the A417. The earthworks would extend along the valley, from west to east, for approximately 350m. This is equivalent in width to approximately 10 motorways.

These earthworks would have a significant adverse effect on the landscape character of this section of the 'High Wold Valley – Upper Churn Valley' (Landscape Character Type (LCT) 8C in the Cotswolds AONB Landscape Character Assessment). They would also have a significant adverse effect on approximately 3ha of lowland calcareous grassland priority habitat - which is one of the 'special qualities' of the Cotswolds AONB – and on approximately 1.5ha of deciduous woodland priority habitat.

The Board recognises the need for some degree of cut-and-fill to achieve an alignment across undulating ground and that some surplus material can be useful in grading out embankments and screening the road. However, this should not outweigh the potential adverse effects on landscape character and biodiversity. To do so would undermine the agreed landscape-led approach. It would also be contrary to local minerals policy of optimising use of useable materials – a point that is highly relevant given the presence of a limestone quarry allocated for expansion only 9km south of the Cowley junction, accessed directly off the A417.

As outlined in response to Question 1, a cut-and-cover option could significantly reduce the amount of excavated material that needs to be deposited elsewhere within the proposed route. This would significantly reduce the need to deposit excavated material in the valley where Shab Hill Junction is currently proposed. With less infilling, the junction / roads could be constructed at a lower elevation, although the Board's preference would be for the junction to be moved further north – as outlined below.

The Board's recommendation in relation to the adverse effects of Shab Hill Junction is provided in the summary above.

Shab Hill Junction - location

The Board has previously suggested that Shab Hill Junction could potentially be located up to a few hundred metres further north, at the southern end of the proposed cutting (i.e. in close proximity to the point where the Gloucestershire Way currently crosses the Birdlip Radio Station track). In this scenario, the A436, the roundabouts and the road connecting the roundabouts could potentially be largely at existing ground levels, with the A417 passing underneath in the cutting (and emerging not much above ground level at the dry valley where the Shab Hill Junction is currently proposed).

Relocating the junction in this way would have several potential benefits compared to the currently proposed scheme. For example, it could potentially:

- significantly reduce:
 - visual and noise intrusion for Shab Hill Farm (including the Grade II listed Shab Hill Barn) and Rushwood Kennels;
 - noise pollution and visual impacts across the wider landscape;
 - adverse impacts on the head of the Upper Churn Valley, where the junction is currently proposed.
- allow for:
 - shallower gradients for the A417;
 - the Gloucestershire Way to more closely follow its current route and provide a more pleasant walking experience on this route.

The Board has devised an updated schematic of the potential layout of this revised Shab Hill Junction, potentially in combination with the cut-and-cover option that the Board has proposed in response to Question 1. The schematic takes account of the potential constraints that might limit how far north the junction and the slip roads could potentially be located, in relation to how the road curves round from the Air Balloon. The Board would be happy to share and discuss this schematic with Highways England.

The Board's recommendation in relation to the location of Shab Hill Junction is provided in the summary above.

The link road from Birdlip to Shab Hill Junction

The proposed scheme includes a link road from Birdlip to Shab Hill Junction. This link road would utilise the existing road network, including the B4070, part of the current A417 and the minor road between Barrow Wake and Birdlip Radio Station.

The Board has previously asked Highways England to consider an alternative option, which would incorporate a bypass to the south of Birdlip, which would connect with the current A417 to the east of Birdlip and then Cowley Junction. This would have a number of potential benefits, compared to the current proposal. These include:

- significantly reducing the amount of traffic passing through Birdlip village⁶;
- making the whole area between Birdlip and the Air Balloon and between Barrow Wake and Shab Hill virtually car free;
- providing a fantastic opportunity to enhance landscape connectivity between Birdlip and Crickley Hill;

⁶ Discussions with Highways England have indicated that there are likely to be approximately 5,000-6,000 vehicle movements per day through Birdlip with the current proposal, although this has not been confirmed.

- the potential to downgrade the B4070 north of Birdlip and the minor road from Barrow Wake to Birdlip Radio Station - could potentially be incorporated into the proposals for the repurposed A417;
- further enhancing the tranquillity and air quality of the Cotswold escarpment and the Cotswold Way National Trail;
- further enhance biodiversity, by reducing the amount of traffic in close proximity to the south east edge of the Crickley Hill and Barrow Wake SSSI;
- potentially reducing the scale of infrastructure that is currently proposed at Shab Hill Junction and the associated adverse effects (as outlined above).

Any further consideration of this proposal should also take into account the Board's suggested revisions to Cowley Junction (see below).

The Board's recommendation in relation to this alternative option is provided in the summary above.

Cowley Junction

The proposed vertical alignment and layout for Cowley Junction would potentially destroy what remains of an important Roman settlement that was discovered when the present roundabout was built. This layout and alignment should be reviewed and, ideally, revised.

The Board's recommendation in relation to Cowley Junction is provided in the summary above

The route from Shab Hill to Cowley Junction

The Board is not convinced that the proposed vertical alignment best meets landscape and other environmental considerations – especially when considered in relation to the Shab Hill Junction and Cowley Junction and whether minor roads and access should be aligned over or under the main carriageway.

4. Do you have any comments on our proposal for Alternative 2 as the preferred A436 link road?

Summary

The currently proposed Alternative 2 option for the A436 link road was devised and put forward by the Cotswolds Conservation Board ('the Board'). As indicated in the consultation documents, Alternative 2 performs better, both economically and environmentally, than Highways England's original link road proposal (Alternative 1). However, there is still scope for further reducing the landscape and visual impact of the link road.

If the cut-and-cover option (proposed in the Board's response to Question 1) is considered to be viable and becomes the preferred option for the section of the A417 between Cold Slad Lane and Shab Hill, then the merits of the proposed route of Alternative 2 (compared to Alternative 3) become less clear cut.

The Board's key recommendation in relation to Question 4 is:

- Give further consideration to altering the alignment of the A436 link road to a lower contour line.
- If a cut-and-cover option is shown to be viable and becomes the preferred option (instead of the proposed cutting between Cold Slad Lane and Shab Hill Junction):
 - review the relative merits of Alternatives 2 and 3 for the A436 link road.

If Alternative 2 still remained the preferred option, there may still be scope to improve the exact route of Alternative 2.

It is worth noting that the Board would prefer Alternative 2 to Alternative 1 in either scenario. The significant adverse effects of Alternative 1 means that it should not be brought back into consideration.

Supporting Information

The currently proposed Alternative 2 option for the A436 link road was devised and put forward by the Cotswolds Conservation Board ('the Board'). Highways England has identified that Alternative 2 performs better, both economically and environmentally, than their original link road proposal (Alternative 1).

From a landscape perspective, one of the key advantages of Alternative 2, compared to Alternative 1, is that it allows for a significant area along the top of the Cotswold escarpment, including adjacent to sections of the Cotswold Way National Trail, to become car free.

When the Board put forward Alternative 2, it also put forward what is now referred to, in the consultation documents, as Alternative 3. A significant factor in Highways England identifying Alternative 2 as the preferred option (over Alternative 3) was that closely aligning the A436 with the new A417 route would reduce land-take and would reduce the overall area of land affected by these routes. However, the result of this, far from being beneficial, opens the scheme up to views from the north which would look straight into eight lanes of traffic on three parallel carriageways (one higher than the others) instead of looking at a prominent grassy hillside. The combined cutting for the A436 link road and the A417 is up to 165m wide at the relocated roundabout, 110m wide where the alignments merge and over 20m deep from its western edge.

The Board has put forward a number of suggestions for how these impacts could be further reduced by adopting alignments that are better attuned to the landform (e.g. by following a lower contour line) and to the natural visual screening offered by Ullen Wood. This could also help to reduce the gradient of the link road. This reduced gradient could reduce the need for a crawler lane, which, in turn, could further reduce the visual impact.

If the cut-and-cover option is considered to be viable and becomes the preferred option for this section of the A417, the Board's suggested re-alignment of the A436 link road and the A417 becomes even more beneficial. This is because at least part of this section of the A417 would be underground and the A436 link road would be better screened at a lower elevation. When viewed from the north, the section between Emma's Grove and the top of the slope north of Birdlip Radio Station, would mainly be seen as a grassy hillside (as it currently is), rather than the eight lanes of traffic on three carriageways that would be seen in the proposed scheme.

In the cut-and-cover option, the benefits of Alternative 2, as compared with the benefits of Alternative 3, would become less clear cut. This is because Highways England's preference for the A417 and A436 to be directly adjacent to each other would no longer be relevant. Therefore, if a cut-and-cover structure becomes the preferred option, the Board considers that it would be appropriate to review the relative merits of Alternative 2 and Alternative 3. Key considerations in this review would include the visual impact of the two options (for example, for receptors in Crickley Hill Country Park), impacts on the ancient woodland of Ullen Wood and impacts on the Public Rights of Way (PRoW) network.

If Alternative 2 still remained the preferred option, the Board's proposed cut-and-cover option would provide added flexibility for the exact route of the link road, including the opportunity to adopt alignments better attuned to the landform, as outlined above.

It is worth noting that the Board would prefer Alternative 2 to Alternative 1 in either scenario. The significant adverse effects of Alternative 1 means that it should not be brought back into consideration.

The Board's key recommendation in relation to Question 4 is provided in the summary above.

5. Do you have any comments on our proposals for repurposing the existing A417?

Summary

The Cotswolds Conservation Board ('the Board') acknowledges the potential benefits that the proposed re-purposing of the A417 could provide, including:

- creating a new route for walkers, cyclists and horse riders;
- the proposed tree planting, native hedgerows and species-rich grassland;
- enhanced tranquillity and air quality along this section of the High Wold and Cotswold escarpment.

However, it should also be noted that, under the proposed scheme, none of the land would be reverted to farmland or to the pre-1980s landscape field pattern that is obliquely severed by the current road.

Therefore, the Board suggests that further consideration should be given to how the repurposed A417 could integrate more effectively with the local landscape character of the Cotswolds AONB. For example, in some circumstances and / or locations, it may be appropriate to realign the proposed recreational route with pre-existing field boundaries.

6. Do you have anything you think we will need to consider as we develop our construction plans further?

Summary

A key consideration as the construction plans are developed further should be the agreed landscape-led approach, which should underpin the scheme. A key component of this landscape-led approach should be a comprehensive assessment of the overall balance of adverse and beneficial effects. Given that there is still a lot of data to be compiled and assessed, it is very difficult to gauge this overall balance at this stage. However, given the significance of the potential adverse effects outlined above, it is likely that the scheme, as currently proposed, would cause substantial harm.

It is vital that this assessment is undertaken and discussed with key stakeholders - and the potential to ameliorate harm and maximise enhancement, as recommended in this consultation response, is fully explored – well before the planning application is submitted.

The Cotswolds Conservation Board's ('the Board') key recommendation in relation to this issue is to:

- Undertake a comprehensive, quantitative assessment of the overall balance of adverse and beneficial effects across all Environmental Impact Assessment (EIA) topics, both individually and cumulatively.

Given the principle of a landscape-led approach for this scheme, this assessment should pay particular attention – and give signification weight - to the topic of landscape and to the other factors that contribute to the natural beauty of the Cotswolds AONB.

The Board's recommendations relating to Question 1-5 and Question 7 are also relevant to Question 6.

Supporting Information

Landscape-led approach

Highways England, the Board and other key stakeholders have agreed that a landscape-led approach should underpin the A417 missing link scheme. This landscape-led approach is articulated in the Scheme Vision, Scheme Design Principles and Scheme Objectives. Therefore, a key consideration is whether the scheme, as proposed, delivers this landscape-led approach (and provides the best practical option for doing so).

The 'Scheme Vision' is for a landscape-led highways improvement scheme that will, inter alia, conserve and enhance the special character of the Cotswolds AONB, reconnect landscapes and ecology, bring about landscape, wildlife and heritage benefits and improve local communities' quality of life.

The 'Scheme Design Principles' are that:

- Any solution ... must ensure that the scheme is designed to meet the character of the landscape, not the other way round.
- Any scheme should bring about substantial benefits for the Cotswolds landscape and environment, as well as people's enjoyment of the area.
- Any scheme must have substantially more benefits than negative impacts for the Cotswolds AONB.

It is worth noting that this final design principle closely aligns with the Government's '25 Year Environment Plan' intention to embed a '*net environmental gain*' principle for development.

This landscape-led approach, including the balance of adverse and beneficial effects, should be a key consideration as the scheme proposals are developed further.

In order to assess the success of the scheme in delivering this landscape-led approach, the Board considers that it will be essential for a comprehensive assessment to be undertaken of the overall balance of adverse and beneficial effects. This assessment should be applied to all of the Environmental Impact Assessment (EIA) topics, both individually and collectively.

Given the agreed principle of a landscape-led approach for this scheme, this assessment should pay particular attention – and give signification weight - to the topic of landscape (including the special qualities of the Cotswolds AONB) and to the other factors that contribute to the natural beauty of the Cotswolds AONB (including the inter-relationship of these factors).⁷ With regards to visual impact, it will be important to provide a more comprehensive set of cross sections, as well as a comprehensive set of visualisations for key viewpoints.

The Preliminary Environmental Information Report (PEIR) identifies that there is still a large amount of data that needs to be collated and assessed. As such, the Board acknowledges that it is not currently possible for Highways England to fully assess the overall balance of adverse and beneficial effects. For example, the PEIR only goes as far as to state that '*there will be a mix of adverse and beneficial effects*'. However, the Board considers that it will be crucial for Highways England to undertake this full assessment – and discuss its findings with key stakeholders and fully explore the potential to ameliorate harm and maximise enhancement, as recommended in this consultation response - well before they submit the planning application.

This assessment should, where possible, be quantitative. This should include comparing the proposed scheme with the current status and, where appropriate, alternative options (including the recommendations that the Board is making in this consultation response). For example, with regards to:

- biodiversity, it should quantify losses and gains in area of priority habitats and length of hedgerow (which should also be calculated for historic landscape interest);
- landscape, it should compare a Landscape and Visual Impact Assessment (LVIA) of the proposed scheme with a LVIA of the current roads - both LVIAs should clearly differentiate between the sensitivity of receptors and the magnitude of effect;
- local distinctiveness, it should quantify the losses and gains in the length of dry stone walls;
- tranquillity, it should quantify the area of land, length of rights-of-way and number of properties affected by different levels of noise (i.e. decibels and 'effect levels').
- archaeology, it should quantify the areas of potential loss (including loss of ploughzone archaeology due to soil handling requirements) and the potential for improved physical preservation should be calculated;
- material assets and waste, it should quantify the footprint of the proposed earthworks and landscaping.

⁷ A useful reference point, with regards to the factors that contribute to natural beauty, is Natural England's '*Guidance for assessing for assessing landscapes for designation as National Parks or Areas of Outstanding Natural Beauty in England*' (e.g. Table 3 and Appendix 1). The policy headings of the Cotswolds AONB Management Plan 2018-2023 also provide a useful reference point in this regard.

The assessment should clearly and consistently quantify the significance of adverse and beneficial effects. For example, it should specify whether the effects are major, moderate, minor or neutral. The assessment should also explain the changes that would occur as a result of the proposed scheme, objectively and in clear language. It should explicitly relate the findings of the assessment to the scheme vision, design principles objectives and sub-objectives and to the policy tests for each topic and their interactions.

The assessment should clearly articulate the effects of the scheme at different points in time. The PEIR currently provides conflicting definitions of the relevant timescales. For example, paragraph 7.5.18 states that '*the duration will be reported as short term (0-3 years), medium term (3-15 years) and long term (over 15 years)*'. This is contradictory to para 7.5.23 (Temporal Scope) which explains that that short term relates to the construction phase, medium term relates to year one to year 15 of the operational phase and long term if beyond the 15th year of the operational phase. The Board suggests that a more appropriate temporal scope would be:

- Construction phase (3 years).
- Operational phase:
 - Short term (0-3years from start of operational phase)
 - Medium term (3-15 years from the start of the operational phase)
 - Long term (15 years+ from start of operational phase)

The assessment should also be consistent in the way that it addressed permanent impacts that result from the construction phase (which doesn't seem to be the case in the PEIR).

The Board's key recommendation in relation to the landscape-led approach is provided in the summary above.

Tunnel options that the Board has previously put forward

The Board has previously asked Highways England to consider three tunnel options, which we have referred to as the 'Gold', 'Red' and 'Blue' options. For example, we advocated consideration of these options in our response to the Environmental Impact Assessment (EIA) Scoping consultation in June 2019. The 'Red' option incorporated a cut-and-cover option along the lines of the one that we have now identified as being financially viable.

In the Board's EIA Scoping consultation response we made the following comments:

We have advised Highways England that there are alternative options that were not identified in the options appraisal process that could meet (or at very least much more fully address) the scheme Vision, Design Principles and Objectives. These would also much more fully inform the NPSNN tests to demonstrate the 'exceptional circumstances' required to justify construction of new infrastructure in an AONB; and would fully take into account other relevant policies and legislation.

We believe that this policy context means the EIA must consider more ambitious but still – in a national context – proportionate measures to 'ameliorate' (i.e. 'avoid', 'remedy' and 'reduce') adverse environmental effects, taking account of costs and achieving high environmental standards. For example, given the substantial depth of cuttings that are now being proposed through a very sensitive part of the Cotswolds escarpment and the potentially difficult ground and groundwater conditions, the Board has identified that the cost difference between the cuttings proposed and an alternative involving a 'cut-and-cover' tunnel may not be significant.

Taking these points into account, the Board's principle recommendation is that the alternative options that are assessed and compared in the EIA should include the 'Gold', 'Red' and 'Blue' options shown in Annex 3. It is worth noting that:

- all three alternatives are significantly different from tunnel options considered prior to public consultation*
- all of the Board's alternatives are presented as holistic landscape-led vision incorporating other beneficial considerations such as a Birdlip relief road instead of the proposed Birdlip Link.*
- all the options are within the range of best past practice for protected landscapes.*

Whilst the Board appreciates the financial envelope that constrains the scope of the proposed scheme, we suggest that Highways England does not rule out giving these further consideration, particularly if the financial envelope for the scheme was to increase.

7. Do you have any comments on our PEI Report and other proposed mitigation measures?

Summary

The Board's key recommendations in relation to Question 7 are as follows:

- Give greater consideration to:
 - providing a more coherent narrative regarding the interactions between landscape, historic landscape character, habitats and wildlife, and public access, and the implications of these interactions for a landscape-led scheme;
 - the cumulative effects, on the Cotswolds AONB, of the proposed scheme in combination with its forerunners in creating the Swindon to Gloucester Expressway (in line with PINS Advice Note 17);
 - clarifying exactly how different areas of land within the 'red line' will be used (e.g. what will go where), during both construction and operation, and what the environmental effects of this will be;
 - highlighting clearly the sheer scale of the proposed scheme, particularly in comparison with major road schemes, involving cuttings and / or tunnels, in (or near) other protected landscapes.

Supporting Information

Individually, the coverage of some topics in the PEIR provides valuable new insights – notably the geotechnical and hydrology desk study and fieldwork proposals. However, the coverage of some others topics, such as heritage and archaeology, is a lot more limited.

The Board's response to Question 6 has already highlighted a key concern relating to the amount of data that still need needs to be compiled and assessed. This makes it very difficult to comprehensively gauge the overall balance of adverse and beneficial effects at this stage.

In addition, the Board would like to flag up the following issues in relation to Question 7:

- the interactions between different environmental topics and the implications of these interactions for a landscape-led scheme;
- the cumulative effects of the proposed scheme in combination with its forerunners in creating the Swindon to Gloucester Expressway;
- how the land within the proposed 'red line' will be used during the construction and operational phases of the scheme; and
- the scale of the proposed scheme.

Interactions

As highlighted in the Board's response to the A417 Environmental Impact Assessment (EIA) scoping consultation in June 2019, the Board recommends that Highways England should thoroughly assess the interactions between the various environmental topics. In particular, for a landscape-led scheme, it is important to assess the implications of these interactions against the agreed vision, design principles and objectives.

The Board's key recommendation relating to this issue is provided in the summary above.

Cumulative effects

As with the previous comments relating to 'interactions', the Board has previously highlighted (in our response to the EIA scoping consultation) the need to thoroughly assess the cumulative effects of the proposed scheme. This includes the cumulative effects of the different components of the scheme itself. However, it also includes the cumulative effects of the scheme in combination with its forerunners in creating the Swindon to Gloucester Expressway (e.g. the construction of the A417 dual carriageway between Swindon and Cowley Junction).

The Board's key recommendation relating to this issue is provided in the summary above.

Red line

The PEIR helps to explain the purpose of the 'red line' boundary. However, it doesn't, at this stage, provide a clear indication of exactly how each block of land within this 'red line' boundary will be used during the construction and operational phases. This is an important consideration as it could potentially influence the adverse and beneficial effects of the scheme. Therefore, it will be important for Highways England to provide this information – and discuss it with key stakeholders – well before the planning application is submitted.

It would be very difficult to provide a definitive red line boundary until all the relevant data has been compiled and assessed. For example, the Landscape and Visual Impact Assessment(s) (LVIAs) might show that it would be appropriate to mitigate some of the visual impacts off-site, near the 'receptor', as well as within the current red line boundary.

The Board's key recommendation relating to this issue is provided in the summary above.

Scale

From the consultation documents that have been provided, it is very difficult to get an impression of the overall scale of the proposed scheme. For example, the 'Consultation Plan' simply shows the proposed scheme as a relatively thin line, overlying a flattened geography on A3 paper. The only data that really provides an indication of the overall scale of the scheme is the earthworks data in Table 10-12 of the Preliminary Environmental Information Report (PEIR), which the Board has referred to in response to Question 1. However, even this data is hard to visualise.

In its response to this consultation, the Board has endeavoured to provide a more explicit indication of the scale of the proposed scheme. For example, we have compared the volume of material that will need to be extracted and disposed of with a number of other measurements that are relatively easy to comprehend. We have also compared the depth of the proposed cutting to the height of double decker buses and the width of the cutting, the roads and the earthworks to the width of a motorway. In addition, we have compared the scale of the cutting in the proposed scheme with the scale of cuttings in other major road schemes in, or near, other protected landscapes.

It would be very helpful if Highways England's documentation, including the future planning application, made the scale of scheme much more explicit.

The Board's key recommendation relating to this issue is provided in the summary above.