

A303 - Stonehenge to Berwick Down Scheme

Written Representation of:
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Executive Summary

This written representation to the Examining Authority is a composite of the views of Winterbourne Stoke Parish Council (WSPC) and Dr Andrew Shuttleworth (ADS), a member of WSPC. This has been done for efficiency, simplicity and to prevent any unnecessary repetition.

Our starting point is that a bypass of both Stonehenge and Winterbourne Stoke is long overdue. Whilst we and many of our fellow villagers would have preferred a solution that either skirted the World Heritage Site (WHS) entirely, by taking the A303 to the north of Durrington, Larkhill and Shrewton (an option never considered) onto MoD land, or to the south of Amesbury and west, along the alignment of the A36 to the west of Stonehenge and rejoining the current A303 at Wylde, we now have a proposed solution which, though not ideal, is the least bad of those offered.

The points raised in our written representation thus seek to make the best of this route, for the village as a whole, in the short, medium and long term. My points specifically address the following issues:

1. the need and justification for a safe north-south crossing (ideally an underpass) of the A303 at the western end of the scheme at Yarnbury Castle. Highways England have artificially ended the proposed scheme to the east of the byway crossing; ignoring the impact the scheme is going to have on traffic speeds and safety as a result of improvements to the east of this point;
2. the undesirability and lack of credible justification for Green Bridge 1 in Winterbourne Stoke. Highways England's justification

for this is demonstrably unsound and they have changed their rationale for it on three occasions since the scheme was first proposed;

3. the need to convert the route of the existing A303 to the west of Winterbourne Stoke to a gated, restricted byway, to allow limited controlled farm access and to restrict likely criminality;

4. the need for removal/filling-in of the existing lay-by to the west of Winterbourne Stoke to minimise its attraction to the travelling community and to restrict opportunities for criminality (eg. hare-coursing)

5. the need for both visual **and sound** barriers on the southern side of the Till viaduct and through the village. Furthermore, the need for visual barriers to be much higher than the proposed 1.5 metres. We believe the models used to assess sound levels, although in common usage, are unfit for purpose, are non-compliant with the UK Government's Aqua Guidelines¹ and consequently, should not have been used to assess noise impacts for this scheme. Visual assessments seem to ignore the fundamental human response to movement and light in the visual field. The proposed visual barriers at 1.5m high are too low to achieve any realistic improvement in visual intrusion;

6. the need to reroute the proposed cycleway and footpath to the east of Winterbourne Stoke and a Green Bridge Crossing of the A360: re-routing the proposed footpath to the south of the current A303 does away with the need for a crossing of the old A303 at Longbarrow and requires a new Green Bridge on the A360, near its junction with the new route of the A303 at

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/416478/aqua_book_final_web.pdf

Longbarrow, instead of the proposed light-controlled crossing for equines, cyclists and pedestrians proposed by Highways England, as a critical safety measure;

7. *the need to ensure that Highways England have sought the appropriate scientific and health advice regarding the inhalation risks posed by radiation from particulate alpha emitters (particularly isotopes of polonium, bismuth and lead) found in any phosphatic chalk excavated from the proposed tunnel. Highways England have seemed unable to understand that the hazard posed by dried phosphatic chalk spread onto the land surface, comes not from the radon, a decay product of the uranium contained therein, but from particulate, α -emitting radon progeny, which can be inhaled into the deep lung, or ingested, by animals and humans. This can lead to increased incidence of cancer in those so exposed; and the level of risk needs to be determined. - **This concern has now been overtaken by events and is the subject of AQ 1.20 of the Planning Inspectorates first Written Questions².***

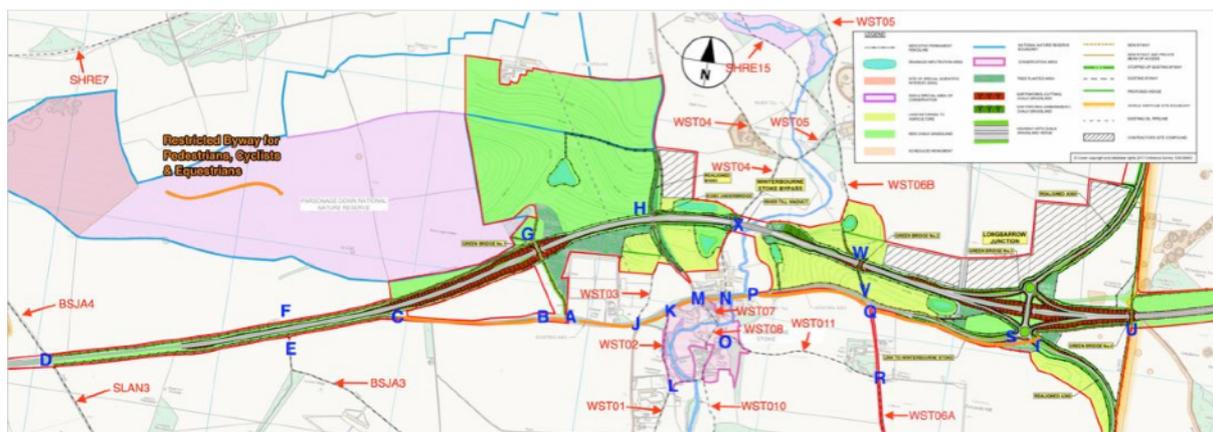
²<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010025/TR010025-000575-TR010025%20ExA%201st%20Questions%20-%20FINAL.pdf>

Representation Detail

1. The Need For A North/South Crossing Of The A303 At Yarnbury Castle

1.1 Highways England, quite reasonably, have to terminate the westward end of the A303 scheme at some point to the west of Winterbourne Stoke. Our contention is that their selection of a point immediately to the east of the crossing between Byways SLAN3 and BSJA4 (see point D, in blue, on the map below) is cynical in the extreme and demonstrably irrational on the grounds of public safety.

Figure 1: Map of Winterbourne Stoke with associated keypoints (blue) and Wiltshire Council byway numbers (red)



1.2 At present, when eastbound traffic is free-flowing, vehicles familiar with the road are preparing for the two eastbound lanes to merge into a single lane, some 1,000 metres (about 30 seconds of travelling time) to the east. As traffic jams often begin at this point,

regular drivers are, possibly, a little more alert to potential dangers at this point and may already be slowing.

1.3 Westbound traffic, slowed by its transit through Winterbourne Stoke and up the hill to the west of the village at 40 mph, is still accelerating at the point it reaches the Yarnbury Crossing; particularly the HGVs.

1.4 As a consequence of both these effects, crossing both carriageways, sheltering at the central reservation if necessary, whilst not particularly pleasant, is achievable in reasonable safety for the fit and active, on foot and by bike. Crossing with a horse may be more difficult - particularly if the horse is skittish.

1.5 If the volume of the traffic increases to the point at which a traffic jam is likely to occur (most parts of the year from Thursday lunchtime to Monday lunchtime) crossing at this point becomes increasingly dangerous.

1.6 When the traffic is static on the eastbound carriageway, crossing the A303 at this point can prove almost impossible, due to vehicles attempting to make "U-turns" through the central reservation to head back west and avoid the traffic jam.

1.7 Once the bypass of Winterbourne Stoke is completed, vehicles travelling east will no longer anticipate needing to slow on the approach to Winterbourne Stoke and all vehicles travelling westwards will be travelling above, at or only slightly below the national speed limit of 70 mph when they arrive at point D. Both these effects will combine to make crossing the A303 at this point much more dangerous than at present as users will have less time to cross to, or from the central reservation in front of vehicles.

Figure 2: Picture showing cars using Yarnbury Crossing to make “U-turns” (Summer 2018)



1.8 There is a strong likelihood that traffic on the A303 will increase once the road is improved, above and beyond any year-on-year increases anticipated. This will reduce gaps between vehicles, contributing further to the danger of crossing.

1.9 Suggestions that vehicles (including farm and military vehicles), pedestrians, cyclists and equestrians should divert eastwards along the new byways to the north and south of the line of the A303, to make a crossing of the A303 in Winterbourne Stoke , are simply unrealistic.

1.10 Given all the above, the western end of the scheme should be moved to the west of the Yarnbury Crossing at point D in Figure 1. To minimise these legitimate safety concerns, an underpass of the A303 should be provided (a bridge would not be appropriate at this point due to the archaeology). Entry/exits onto the A303 from SLAN3 and BSJA4 should be removed for the same reason and the gap in the central reservation could be stopped-up, enhancing traffic safety on the A303.

1.11 A safe crossing at point D is critical in joining byway networks to the north that run towards Wales and to Grovelly Wood and the Kings Way to the south - which connect byway networks westward to Dorset and Devon.

2. The Undesirability And Lack Of Credible Justification For Green Bridge 1 In Winterbourne Stoke

2.1 Great play was being made by Highways England on page 16 of the original Public Consultation Document³, that Green Bridge 1 was being built primarily to allow Barbastelle bats to cross the new dualled section of A303 in Winterbourne Stoke.

At this location the green bridge would have landscaped earth mounds, with planted hedgerows that align with a current bat flightpath, allowing the bats to continue on their flightpath above the new road. The bridge would also accommodate farm access and a new pedestrian, cyclist and horse riding route across the road.

³ A303 Stonehenge: Public Consultation Booklet 2018 https://highwaysengland.citizenspace.com/he/a303-stonehenge-2018/supporting_documents/Digital%20consultation%20booklet_v2.pdf

Farm access, pedestrian and equestrian use were listed as secondary functions. ADS had counter-proposed that a simple bat bridge, as used on other road schemes would suffice for the primary purpose claimed by Highways England.

Figure 3: Bat Bridge



2.2 Scientific evidence presented by Highways England at our early meetings to develop a Statement of Common Ground, from Professor John Altringham, University of Leeds (Bat consultant to Highways England), indicated that bat bridges do not work as intended. Consequently, ADS and the Parish Council withdrew that proposal.

2.3 However, Prof Altringham and others⁴ pointed out that there is very little evidence that bats will use a Green Bridge either. Consequently, we believed that the stated primary purpose of Green Bridge 1 was untenable and it should not be built. This point was raised again with Highways England, who, once again, rebutted the argument⁵, suggesting in late 2018 that Prof Altringham had “new evidence that showed Green Bridges did work after all”. ADS obtained and reviewed this latest evidence on behalf of WSPC and it quickly

⁴ Stephan S, Bettendorf J. 2011. Home ranges of Bechstein's bats overlapping a motorway. European Bat Research Symposium, Vilnius, Lithuania (Poster presentation)

⁵ Green Bridge One - Rationale and Bat Mitigation HE551506-AMW-TTN-SW_GN_000-TD-CU-0017

became apparent that once again, the “evidence” presented by Highways England did not support their claims.

2.4 A “future needs” paper⁶ by Altringham and many other international specialists indicated flaws in historic methodologies to show use of mitigation features by bats. It proposes better methodologies which begin by studying the movement of bats in the natural terrain before a linear feature is installed, then looking at the percentage of bats still moving across the new feature using tunnels, green bridges, etc for a period after the feature is constructed. It specifically says the following in relation to Green Bridges:

These structures are reported to be used by crossing and hunting bats often. Use varies however, and it is unclear if the animals are using it for crossing, as a hunting habitat, or both. Often, controls are missing in the studies (e.g. how many bats crossed prior to construction, how many cross unsafely), as are descriptions of vegetation on the bridges and connectivity to nearby bat habitats in some of the studies. To understand the effectiveness of green bridges, more systematic studies that include controls are needed. Research is also needed on the placement in relation to other bat habitat, the minimum and optimum sizes (width in particular) and the extent and nature of the vegetation and other habitat features (e.g. dead trees) that influence use by bats.

2.5 That was published in December 2016, so few studies can have been conducted since the methodology was proposed. Altringham’s most recent available paper “*Bats and Linear Infrastructure*” (2017)⁷, was a DEFRA research project and had the the following as key findings:

⁶ CEDR Call 2013: Roads and Wildlife SafeBatPaths : Fumbling in the dark - effectiveness of bat mitigation measures on roads ; Future research needs for the mitigation of the effects of roads on bats
https://www.researchgate.net/publication/313108767_Fumbling_in_the_dark_-_effectiveness_of_bat_mitigation_measures_on_roads_-_Final_report

⁷<http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=18518>

- The effectiveness of nine existing mitigation features for bats on roads was assessed: three underpasses, three wire bridges, an overpass, an environmental bridge and a green bridge.
- One underpass and the green bridge were effective in guiding a large majority of bats under or over the roads.
- Underpasses were more likely to be used successfully by commuting bats than overpasses and bat gantries/wire bridges, both of which were consistently ineffective.
- A bat gantry erected close to a known commuting route was not being used by bats nine years after construction (Berthinussen & Altringham 2012b).
- Green bridges appear to have **considerable potential** as mitigation structures.
- The results suggest that the effectiveness of crossing structures increases with their size, connectivity and similarity to natural linear features.

2.6 Unfortunately, whilst Altringham claims that green bridges have considerable potential as mitigation structures, most scientists would suggest that basing this claim on a data-set of 1 (Scotney Bridge on the A21 in Kent) is somewhat overblown.

2.7 ADS provided Highways England with some very important detail omitted from that report - a map of the area and also a shot from Google Earth. These introduced a further concern regarding the claim of the Green Bridge having "considerable potential". First was a major linear feature running almost parallel to the green bridge and only a few metres away from it - the tree-lined B2169, which would certainly have an impact in 'guiding' bats to use the green bridge. This second

feature making it very different to conditions on the A303 are the masses of mature trees on either side of the A21 and to the south west of the green bridge alongside the B2169.

2.8 We think that on the basis of the evidence presented to date, the most Prof Altringham can claim is that green bridges might have some potential as mitigation features, in heavily wooded areas where secondary linear features might encourage bats to make use of it. There is little, or no credible evidence, at this time, to support building a green bridge in Winterbourne Stoke for the purpose initially claimed.

2.9 Even if Altringham's evidence is taken at face value. He makes the point in the summary report that:

- *Crossing structures should be placed on the **exact** location of existing bat commuting routes. Attempts should not be made to divert bats from their existing commuting routes.*

2.10 Previous studies indicate that Green Bridge 1 is to be located 300 metres west of the actual flight line of the Barbastelle bats. The actual flight line will intersect the new A303 at an elevated section and so if Altringham is being followed, a bat tunnel would be more appropriate at the correct location; and Altringham has much more evidence to support tunnels than bridges.

2.11 Subsequent to ADS providing Highways England with this critique, they produced a new document in November of 2018, now claiming that Green Bridge 1 was needed:

"to perform a number of environmental mitigation and enhancement functions, including to maintain a connected landscape for flora and fauna species and assist in the dispersal of chalkland species, whilst also integrating the

bridge into the landscape, maintaining and enhancing the public rights of way, and providing agricultural access, and is located to in the best possible location to meet these needs."

2.12 In other words, Highways England are now claiming that the bats are no longer the prime rationale for Green Bridge 1. We realised at this point that when confronted with hard evidence, rebutting their arguments, Highways England seem to prefer changing their rationale rather than their plans - presumably to save money.

2.13 We would contend that Highway's England's latest rationale is equally flawed. Firstly, the landscape is already severed by the A303, so a Green Bridge cannot "*maintain a connected landscape for flora and fauna species*"; **there is no connection to maintain** . It would provide a link that does not presently exist.

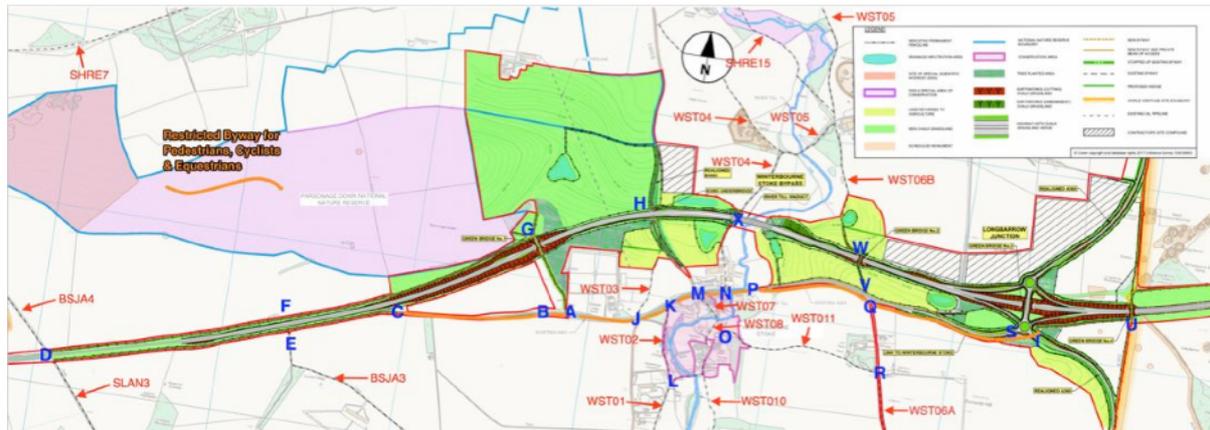
2.14 Second, they claim it will assist in the dispersal of chalk land species - but the new chalk downland being created near Parsonage Down is already directly linked to the rest of Salisbury Plain's chalk downland to the east and north - there is no sound ecological reason for a link to the south for this purpose.

2.15 Consequently, Green Bridge 1 is little more than a feature that is "nice to have".

2.16. HE's tertiary claim for Green Bridge 1, that it is: "*maintaining and enhancing the public rights of way, and providing agricultural access*" is, at least superficially, more reasonable, but still bears closer examination as it betrays a near total lack of understanding of local issues. There are currently no usable ROW close to the site of the proposed Green Bridge, so the claim of maintaining ROW is rather

overstated. WST03 is currently overgrown, gated and blocked by barbed wire at its southern end.

Figure 4: Map of Winterbourne Stoke with associated key points (blue) and Wiltshire Council byway numbers (red)



2.17 The needs of agricultural access could be better met by providing an access from the B3083, north of the A303. So, access to fields at G in Fig. 4 above, instead of being via Green Bridge 1 (A-G), should be from the northern side of the B3083, westwards from point H to point G.

2.18 Although we have focused on the illogicality of Highways England's defence of Green Bridge 1, to demonstrate the lack of intellectual rigour in their approach, perhaps the greatest reason for local objection is the vulnerability to crime that it creates. This part of Wiltshire is frequently visited by hare coursers and the associated criminality that follows in its wake. Green Bridge 1 would make it much easier for individuals to participate in these events to access fields, to which access is currently difficult, and provide a ready escape route in the case of police intervention.

3. The Need To Convert The Route Of The Existing A303 To The West Of Winterbourne Stoke To A Gated, Restricted Byway

3.1 Our rationale for objection to Green Bridge 1 is tied into both this (Point 3) and the following point (Point 4). Replacement of a section of the A303 to the west of the village creates a dead-end (A to C in Fig. 4) that is likely to prove very attractive to travellers, hare-courers and other ne'er-do-wells. Lest this be thought to be exaggerating the concerns, or the reality of the situation, it is worth noting that one of the biggest responses by Wiltshire Police to illegal hare-coursing (Operation ARTEMIS) in recent years took place over the Christmas period in 2018-2019 in Winterbourne Stoke. Our own website⁸ reported:

Following the police swoop, 9 individuals, some from as far away as South Wales, have been reported for offences under the Hunting Act. The police seized two vehicles, mobile phones and 10 dogs. Some of the dogs may have been stolen and enquiries continue. Rural crime is a growing problem and back in October, Wiltshire Police launched Operation Artemis - named after the Greek/Roman goddess of the hunt and of wild places. Op Artemis is part of a broader, national initiative to hit at poaching operations called Project Trepas, which aims to coordinate action across England and Wales through prevention, intelligence, enforcement and reassurance.

This was also reported by the local Press⁹ and the BBC¹⁰.

3.2 It is away from the centre of the village and consequently criminal and antisocial activities are unlikely to be noticed in the first instance;

⁸ <https://winterbournestokepc.org.uk/3527-2/>

⁹ <https://www.salisburyjournal.co.uk/news/17302894.nine-reported-at-illegal-hare-coursing-event-on-salisbury-plain/>

¹⁰ <https://www.bbc.co.uk/news/uk-england-wiltshire-46594443>

via a short slip-road at point D; minimising the works needed at this point..

3.5 Furthermore, non-local vehicles, including HGVs, wishing to visit the chicken farm would do so from the Longbarrow Roundabout at S, travel down the route of the old A303 to the junction with the southern B3083 (J), then travel south to Berwick St James, up byway/farm track BSJA3 to the farm (Fig 5). On leaving the farm, vehicles (HGVs in particular) would travel north towards the A303 at E, then west to an exit onto the A303 at Yarnbury Castle at D. Smaller vehicles could reverse the route (Orange arrow) back towards Berwick St James.

3.6 If this alternative is deemed not viable (ie BSJA3 - already a byway open to all traffic is not suitable for the types of HGV needed to service the chicken farm and the type of vehicle cannot be altered) then a compromise may be for these vehicles to access the proposed gated restricted byway at A and proceed by B, D and E to the north of the chicken farm and then south on BSJA3.

4. The Need For Removal/Filling-In Of The Existing Lay-By To The West Of Winterbourne Stoke

4.1 The existing layby on the A303 at point B should be removed and the ground brought up to level with the existing A303. It has been used for many years as a look-out point to the south and the north of the A303 by hare coursers and removing it is the simplest way of preventing its use in this way.

4.2 All tarmac between point A and C should be removed and returned to a gravelled track, unsuitable for non-farm vehicles.

4.3 Winterbourne Stoke Parish Council are strongly of the opinion that the land in the vicinity of point B would be ideal for exploitation for legacy purposes; to the benefit of both Winterbourne Stoke and surrounding areas. Ideas that have already been mooted include a small village hall/ meeting room/changing room, a sports field, allotments and/or a village orchard.

4.4 By increasing village-oriented activities in this area, its use for criminal purposes would be discouraged. All other proposed uses for the lay-by area (eg a facility for Wiltshire Council) increase the vulnerability to crime.

4.5 A small car park could be provided for the Parsonage Down site at G, rather than at A or B as has been proposed in the past by Highways England. The short stretch of our proposed byway from H to G could be provided with a metalled surface to facilitate access to this new Parsonage Down car park.

4.6 The removal of Green Bridge 1, removal of the existing lay-by and the restriction on byway usage thus have complementary benefits to the village and reduce the likelihood of its exploitation by criminals.

5.0 The Need For Both Visual And Sound Barriers On The Southern Side Of The Till Viaduct.

5.1 **Visual Barriers:** Highways England have proposed that 1.5 metre tall visual barriers alone are needed on the south side of the viaduct over the River Till; we strongly disagree with this position in terms of the types of barriers needed, their location and the specific detail (ie height).

5.2 It is a biological fact that human beings are “hard-wired” to detect motion as part of our historic survival behaviour¹¹.

“The brain . . . is designed to solve problems related to surviving in an unstable outdoor environment and to do so in nearly constant motion (to keep you alive long enough to pass your genes on). We were not the strongest on the planet, but we developed the strongest brains, the key to our survival”

5.3 One important element of that survival is the way in which our brains evaluate movement. Our bias towards motion has its roots in the crucial fight or flight response and is still important now. Simply put, when something moves, we are hardwired to notice and perceive it as a potential threat, **so we pay close attention to it.**

5.4 This is true even today, when such threats have shifted from the sabre tooth tiger to modern stresses such as traffic on the A303. The reaction is still the same: we note the threat and we respond to it, both physically and emotionally.

5.3 There are several corollaries to that biological imperative¹²:

- The direction of movement also is significant: motion towards you suggests a threat, while motion away may or may not spell trouble.
- When something changes direction, its intentions for good or evil may also have changed, so we notice it.
- Speed and acceleration have a similar impact. Faster movement can increase your perception of a threat, so it’s more noticeable. Changes in speed also grab attention, especially when they happen closer to you.

¹¹ <https://theweek.com/articles/460769/12-things-know-about-how-brain-works>

¹² http://www.psych.usyd.edu.au/staff/alexh/research/papers/HowardHolcombe_APP_2010.pdf

- In another connection to our biological roots, when we notice something move, we pause and watch it.

5.4 The bottom line here is quite obvious, whilst a 1.5 metre barrier might conceal cars on the Till Viaduct from observers in Winterbourne Stoke, it will not conceal the larger vans and HGVs. Their movement will be seen and brought to our attention as a perceived environmental threat - that's simply how we, as humans, are designed.

5.5 The situation would be even worse at night, if Highways England's plans are accepted. Clearly, they still believe that most vehicle lights, including those of HGVs, are situated below 1.5 metres from the ground. A few minutes observation by any A-road at night will lend the lie to this idea. All HGVs have "corner lights" which delineate the vehicle at night and indicate to oncoming drivers the presence of an HGV when the road profile might prevent it from being seen. Many HGVs now not only have distracting lights in the cab, behind the driver, a growing number now also have powerful roof-mounted lights that are often between 3.5m to above 4m from the ground.

Figure 6: Peter Green Chilled HGV registered after 1 Sep 2016 - corner lights but no high level lights (LHS). Newer HGV registered after 1 Sep 2018 with high-level running lights in addition to high level corner lights.



5.6 Whilst the the UK, currently, has no legal height limit on HGVs, most of our road network can accommodate lorries up to 4.9 metres high, so any visual barrier that is not going to trigger the human reflexive flight response, and all the hormonal upsets following from its initiation, is going to have to be above the 4.9 metre point.

5.7 Whilst a visual barrier of this height would be quite daunting, it could be 'softened' considerably when viewed from the south, by making use of green-wall technology - already used by many of the more forward-thinking road builders, such as those in Hong Kong¹³. Ironically, their primary use is for noise screening; something Highways England claim is un-necessary here and which we will address next.

Figure 7: Visual screening provided by “green” noise barriers in Hong Kong



¹³ https://www.greening.gov.hk/filemanager/content/pdf/knowledge_database/Guidelines_on_Greening_of_Noise_Barriers_Apr12_e.pdf

5.8 A visual screen for the southern aspect of the new A303 needs to run from a point west of Scotland Lodge Farm, through the village, across the Till viaduct and onwards to the point the A303 disappears into a cutting to the north west of Longbarrow. This continuous run of visual screening is needed to protect the village at all all points HGVs (and their lights at night) might be visible to villagers from their own homes, gardens and public roads and byways. This screening needs to be of sufficient height to prevent the triggering of the human response to movement during both day and at night.

5.9 **Noise Barriers:** Highways England claim that noise mitigation measures are not needed on the southern aspect of the Till Viaduct. Winterbourne Stoke Parish Council believe that the approach taken by Highways England to determine this is fundamentally flawed.

5.10 Highways England's assessment approach for the proposed road scheme and the procedures to assess the likely noise impacts are laid out in The Highways Agency's Design Manual for Roads and Bridges and in The Department for Transport's Webtag guidance as part of its "New Approach to Appraisal". These are underpinned by calculations based on the Calculation of Road Traffic Noise Guidelines (CRTN), first developed in the 1960s, first published by HMSO in 1975 and revised in 1988¹⁴.

5.11 The CRTN was originally developed as a means of determining compensation entitlement under the Noise Insulation Regulations. It was specifically targeted at roads in urban environments. A cynic might

¹⁴ <http://bailey.persona-pi.com/Public-Inquiries/M4-Newport/C%20-%20Core%20Documents/14.%20Noise%20and%20Vibration/14.2.1%20-%20Department%20of%20Transport%20and%20Welsh%20Office%20Calculation%20of%20Road%20Traffic%20Noise.%201988.pdf>

suggest that such a model was designed, from the outset, to ensure that as few properties as possible might benefit from financial reparation. As time passed and the model gained increasing acceptance, it was adopted for a wider range of applications, including the construction of new roads - hence its use by Highway England here and, historically, by governments around the world.

5.12 In traffic noise modelling, the noise level at a receptor position is usually modelled as a function of the traffic conditions (i.e., traffic volume, traffic composition, and traffic speed), road gradient, road surface nature, absorbent ground cover percentage, street configuration, and distance between the traffic emission source and the receptor.

5.13 However, there has been increasing realisation by other governments (eg Australia, Hong Kong, Singapore, India, Kuwait, Scotland) that CRTN, at 30 years since the last revision, is getting rather long in the tooth and that many of its core assumptions (i.e., traffic volume, traffic composition, and traffic speed) and other parameters are outdated and they are looking for replacements¹⁵¹⁶¹⁷.

5.14 We have been told by Highways England on numerous occasions in meetings, and in response to FOIA requests, that because the CRTN is in "common usage", it is the appropriate model for their purposes here. However, its usage clearly isn't as common as it once was and other countries are moving to adopt new models.

5.15 One of the biggest failures of CRTN is that it assesses noise over the period 06:00 to midnight whereas many of the newer models, including those recommended by the EU Noise Directive, assess the

¹⁵ <https://www.hindawi.com/journals/mpe/2015/369620/>

¹⁶ <https://pdfs.semanticscholar.org/f65a/7115e5fdab0bed7b74fe79c3ce60c51b66e4.pdf>

¹⁷ <http://www.starconference.org.uk/star/2013/SykesHill.pdf>

noise over the full 24 hour period with different weightings applied depending on the time of day. This EU approach is compliant with WHO recommendations that relate to the specific health impacts of noise at night, CRTN is not.

5.16 The only way that CRTN can be made to be even part compliant with the latest European Commission guidelines, requires the application of a clumsy fudge-factor to bring it in to line¹⁸. Even then, because of the way CRTN calculates noise at the receiver, it is likely to underestimate or overestimate noise levels by up to 10 dB. Given the dB scale is logarithmic, a 10dB error means that sound levels experienced in reality may be around half or twice those output from the CRTN model. That's a very wide error range of error.

5.17 The CRTN model was designed to work for receivers located up to 300 metres from the noise source. Most of the village is located more than 600 metres from the proposed road and so outside the normal range CRTN was designed for. Whilst CRTN has been used for predictions at ranges greater than 300 metres, even its proponents admit it is applicable in only a few circumstances and we have been able to find no evidence that this would be the case for Winterbourne Stoke.

5.18 Furthermore, Winterbourne Stoke is not in an urban area with the constant background noise of city life. It is a rural area. Transport for Quality of Life in a report to the UK's Noise Association¹⁹ have observed:

Official noise assessment methodologies for new or existing roads and new noise mapping exercises inadequately reflect the level of road noise disturbance in rural areas, particularly in the open countryside. The emphasis on quantitative estimates and noise impacts within buildings fails to capture

¹⁸ <https://pdfs.semanticscholar.org/32b4/09d29b0d811f0c36afe4e01529beea802caa.pdf>

¹⁹ <https://www.transportforqualityoflife.com/u/files/Traffic%20Noise%20in%20Rural%20Areas%20Sep2008.pdf>

how noise is actually experienced in rural areas where the population is dispersed and road noise may create problematic disturbance outdoors or far from the road itself. As a result much noise nuisance caused by traffic in rural areas is 'invisible' to official processes.

5.19 In other words, the “tranquility” of the countryside, a measure much lauded by Highways England in some of the DCO documentation, is actually studiously ignored by them. The same report notes:

“the noise section of the Webtag guidance explicitly excludes ‘quiet or tranquil areas’ from its quantitative assessment on the grounds that ‘tranquillity’ is part of a qualitative assessment in the landscape section of Webtag.2 However, the definition of tranquillity in the landscape section of Webtag does not explicitly mention noise, and to judge from examples from actual road projects, noise appears to receive little attention in this section. A further issue appears to be that this treatment of noise means that tranquillity is considered as just one part of a whole set of landscape factors, and the issue is effectively ‘submerged’. A ‘large negative’ impact on tranquillity would not, on its own, register in the final ‘Appraisal Summary Table’ even if noise was considered a very major intrusion. It also appears that, because 300 metres is viewed as a ‘cut off’ for noise appraisal, the impacts on tranquil areas which are more distant from the road scheme, but still within earshot, tend to be routinely ignored.”

5.20 In a recent (2017) study commissioned by the Council for the Protection of Rural England entitled “The Impact of Road Projects in England²⁰”, that draws upon evidence of short-term impacts (between one and five years after scheme completion) from over 80 road schemes, published by Highways England through its Post-Opening Project Evaluation (POPE) process, supplemented by long-term evidence from four road schemes that were completed between 13 and 20 years ago: the A34 Newbury Bypass, M65 Blackburn Southern Bypass, A46 Newark – Lincoln dualling and A120 Stansted to Braintree dualling, it was noted that re-analysis of the metadata shows that Highways England methodologies constantly underestimate the increase in traffic generated by the simple fact of route improvement. This means noise levels and a host of other negative impacts of road

²⁰<https://www.cpre.org.uk/resources/transport/roads/item/download/4858>

improvement are also likely to be underestimated. The report concludes with a number of fairly damning points including:

The evaluation of road schemes is important and necessary, but the way in which it is currently being undertaken does not provide a suitable basis for policy-making. Instead, the POPE approach produces self-evidently incorrect or misleading results

5.21 We would seem to be the inheritors of this poor policy making when it comes to road design.

5.22 Finally, and we believe that this is a fundamental issue, although the CRTN and all that flows from it may be in “common use” for road building purposes, we do not believe the model has ever been independently verified and validated as per the AQUA Guidelines²¹. As a consequence, CRTN and all it leads to cannot be regarded as being “fit for purpose” or, indeed, an example of best practise and the results should be inadmissible as evidence for the DCO. Highways England might argue that the Aqua Guidelines are only recommendations and thus not binding. Unfortunately, government recommendations that impact on government departments, agencies or government-owned companies, as is the case here, carry the same weight as instructions or direct orders. So, all models used in in the DCO process must comply with the Aqua Guidelines, or be deemed unfit for purpose.

5.23 If we are incorrect in our belief and the CRTN, WEBTAG, etc have been fully verified and validated in a way appropriate to their use here, then we would ask the Inspectors to ask Highways England to have the model’s Senior Responsible Officer explain to them how CRTN, WEBTAG, etc, have been upgraded since 1988 to deal quantitatively with changes to the scientific understanding of: sound propagation (specifically in rural environments); boundary effects; receiver

²¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/416478/aqua_book_final_web.pdf

construction, location and size; rural surfaces and seasonal variations therein; tranquility; etc.

5.24 We suspect, that given the time constraints of the DCO process, Highways England will be unable to demonstrate that their approach to noise modelling is fit for this, or any other purpose. In the short term, we have to take a pragmatic view and whilst the shortcomings of Highways England's modelling should derail the entire process, we do not believe that this would be desirable or in our own best interests - assuming the Inspectors are not minded to ask for the entire scheme to be re-routed several km north into the Salisbury Plain Training Area.

5.25 **Short term:** We propose that the most pragmatic and rational solution would be to provide the maximum achievable sound-proofing on the southern side of the new A303, from a point to the west of Scotland Lodge Farm to the eastern side of the proposed Till viaduct, where the new section of road disappears into a cutting. In designing such sound-proofing we note that the human sensitivity and biological response to sound is very similar to that alluded to earlier in relation to light; it is part of the flight response. Any detectable noise above the ambient background - low in a tranquil rural environment - will be noticed and reacted to. Noise levels at inhabited receivers within Winterbourne Stoke should, as a minimum standard, be fully compliant with the World Health Organisation's "Noise Guidelines for Europe"²².

5.26 **Long term:** Highways England should be instructed to ensure all models used in road-building schemes are AQUA-compliant and no further schemes are submitted for DCO until this is achieved (Hence the request to the Inspectors by ADS on 1 April 2019 at the Preliminary Meeting).

²² http://www.euro.who.int/__data/assets/pdf_file/0017/43316/E92845.pdf

route proposed by HE would be farmland or farmland to be restored to Manor Farm upon scheme completion. This would further serve to reduce the overall amount of land taken from Manor Farm by a further 0.57h plus 0.18h. It is notable that in our latest meeting with Highways England in relation to the SOCG, their representatives observed that they had failed to notice the amount of land available to the south of the A303 "as it had been obscured by the scrub and leaves on the hawthorn bushes when they had looked in summer". Not very reassuring if the same levels of due diligence have been exercised on other parts of the scheme

6.3 Importantly, there would be no requirement for a crossing of the A303 at point S by the new Longbarrow Roundabout. We regard this as a secondary safety feature to protect pedestrians, cyclists and equestrians from the inevitable high-speed tourists taking the wrong exit from the A360 in their attempts to find the A303 or the Stonehenge Visitor's Centre.

6.4 At the new Longbarrow Roundabout, we would suggest that the propose NMU crossing (a Pegasus crossing) is entirely inappropriate for this location on a number of grounds.

6.5 Firstly, the proposal should be rejected on safety grounds alone. Pegasus crossings are unusual and rarely encountered in the UK (the one above is in Wales). The route it is proposed for is going to be used by many foreign visitors, many of whom struggle with the UK traffic system as it is, let alone with the introduction of something unusual; even for this country.

6.6 Mixing equestrians, pedestrians and cyclists at such a crossing on a busy A road and feeder to the A303, as well as a prime access route to the WHS, is the height of folly. There are risks to cyclists from the

equestrians and vice versa in the holding area; though pedestrians could be separated - as shown in Figure 9.

Figure 9: A Pegasus Crossing



6.7 Much of the traffic travelling from the south will be focussing on joining the A303 or entering the WHS. We are concerned that little attention will be paid to an unusual crossing situated in a hidden dip in the road; thereby increasing the risks to NMU.

6.8 Secondly, it creates an artificial barrier between the World Heritage Site entrance and Winterbourne Stoke - effectively severing an easy connection between two halves of the same Parish (The Stonehenge Visitor's Centre being part of Winterbourne Stoke. The severance could impact on tourism and other economic advantages to the detriment of this village.

6.9 Third, the crossing will have to be lit, in order to allow it to be used 24/7. This will require downlighter in the assembly areas and across the carriageway in order that the users can see and be seen by motorised traffic travelling both north and south; contrary to claims by Highways England that there will be no lighting in this area.

6.10 For safety's sake, westbound traffic leaving the A303 at Longbarrow would need to be stopped from joining the roundabout, otherwise the risks of collision with traffic queuing at the Pegasus crossing would be unacceptably high.

6.11 It seems inevitable that the construction and operation of a Pegasus crossing at this point will introduce a source of unwanted, unwarranted and unnecessary light pollution at the western edge of the World Heritage site.

6.12 We propose that a new Green Bridge should be sited over the A360 at this point; and the A360 lowered if necessary to minimise the impact on the sight lines from the WHS. As this Green Bridge would lie outside the WHS and would be used only by pedestrians, cyclists and equestrians, its impact should be minimal. Even if such a Green Bridge had to be raised slightly, it's visual intrusion into the WHS sight lines would, at worst, be minimal and, at best, would afford a slightly raised viewing point from which to observe archeological features at the western edge of the WHS.

6.13 This proposal would be cost neutral to the scheme if plans for Green Bridge 1 were abandoned, as we would prefer.

7.0 Concerns Regarding Hazards Posed by Phosphatic Chalk

7.1 The need to ensure that Highways England have sought the appropriate scientific and health advice regarding the inhalation risks posed by radiation from particulate alpha emitters (particularly isotopes of polonium, bismuth and lead) found in any phosphatic chalk excavated from the proposed tunnel. Highways England have seemed unable to understand that the hazard posed by dried phosphatic chalk spread onto the land surface, comes not from the radon, a decay product of the uranium contained therein, but from particulate, α -emitting radon progeny, which can be inhaled into the deep lung, or ingested, by animals and humans. This can lead to increased incidence of cancer in those so exposed; and the level of risk needs to be determined. - **This concern has now been overtaken by events and is the subject of AQ 1.20 of the Planning Inspectorates first Written Questions**

