# HS2 Phase 2a Consultation on the working draft Environmental Impact Assessment of the route from the West Midlands to Crewe

## Response from the Inland Waterways Association

To be returned to:

DraftEnvironmental2a@dialoguebydesign.co.uk

This consultation closes at 23:45 on 7th November 2016

I do not wish my response to be treated as confidential, although IWA's address should be used if publishing an office for formal communications.

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I am currently a trustee of IWA, deputy chair, and chair of its Navigation Committee and its High Speed 2 Campaign and Communications Group.

IWA has acted to influence HS2 since its public appearance in 2010. IWA communicates with its membership through expert groups and through its 8 regions and 33 branches, each of which has a regional chair and branch chair. On HS2, IWA consults with branch planning officers on specific issues, and more generally on consultation documents and responses via its website, a dedicated email list of individuals interested in HS2 specifically, its Waterways magazine published 4 times each year, and its officers Bulletin communicated electronically monthly. IWA's Navigation Committee and Board of Trustees oversee its responses in terms of policy and tactical alignment with charitable aims and objectives.

# HS2 Phase 2a Consultation on the working draft Environmental Impact Assessment of the route from the West Midlands to Crewe

## Introduction

The Inland Waterways Association (IWA) is a registered charity, founded in 1946, which advocates the conservation, use, maintenance, restoration and development of the inland waterways for public benefit.

IWA members' interests include boating, towpath walking, industrial archaeology, nature conservation and many other activities associated with the inland waterways.

IWA works closely with navigation authorities, other waterway bodies, and a wide range of national and local authorities, voluntary, private and public sector organisations.

IWA accepts that the overall economic and social case for the proposed High Speed Rail network is for Government to make and for Parliament to decide.

If it proceeds it will have major adverse impacts on the local environment and quality of life of many people on its route, both during construction and operation, including impacts on the inland waterways infrastructure and users. The waterways affected include both existing navigations and canals under restoration for which equal consideration and provision should be made.

IWA considers that the project needs to be designed and implemented so as to minimise its impacts, to mitigate those impacts that cannot be avoided, and to fully compensate all those disadvantaged by its construction and operation.

## The Phase 2A Western Leg (West Midlands to Crewe)

## Consultation Question 1: Comments on the Non-technical Summary (NTS)

Fig 9 Noise Fence Barrier shows a barrier around 5m high. This is unrepresentative, as there does not appear to be a noise fence barrier this high in the entire Working Draft- one 2-3m high might be more appropriate.

4.4 suffers from the potential impact of Design Refinement. The IMD at Crewe is mentioned, along with the maintenance loops at Pipe Ridware however both are subject to major change if the Design Refinement is implemented. The NTS could usefully cross reference these potential changes, which are significant, if not resolved by the time of a future consultation.

7.12 discusses the element now included in the EIA as a result of new EU legislation (2014 EIA). That legislation requires projects be tested against significant changes in external situations which may impact the project. This overview seems to focus on the wrong target- namely whether the railway will be safe within its context. Surely the EIA legislation is asking the project to look at the consequences of low likelihood but high consequence events which has not been done here.

8.2 Fradley to Colton overview- again the opportunity to cross reference the possible removal of the Pipe Ridware maintenance loops as a result of the Design Refinement has been missed.

8.3 Colwich to Yarlet- the community impact on the business of Great Haywood Marina may be very significant, if noise generated by construction drives boaters elsewhere and the continuing noise from operation prevents them coming back.

8.4 Stone and Swynnerton- the Proposed Scheme mentions the possible siting of the IMD here, but not its possible consequence of replacing the Pipe Ridware maintenance loops.

8.6 South Cheshire- the amount of uncertainty around aspects such as the location of the IMD, and the link lines to the WCML let alone the unknown impact on and development of Crewe Station make this a difficult section to form a sensible view on. Hopefully there will be much more certainty by the time the EIA is finalised.

## Question 2: Comments on volume 1 of the working draft EIA Report

## Volume 1: Introduction and Methodology

Forward- Work in Progress- whilst the document does a good job of highlighting the current environmental baseline and impacts, there is very little on health. As a result the means of avoiding reducing or managing the significant effects are clearly mainly generic.

1.1.5 suggests that Crewe will help act as a hub for passengers as this scheme is accelerated. However the EIA makes it clear that the route will stop short outside Crewe without any highspeed rail link into the town. Given the potential for impact on existing rail operations during construction, the speed of work seems to be outstripping the ability to get to the right solution.

2.3.8 Whilst this section describes the criticality of the WCML and its need for capacity, there is a danger that construction of Phase 2A may exacerbate this in the short term, particularly if the IMD and HS2- WCML links are progressed as planned without the Design Refinement changes.

2.3.21 The risks to Basford Hall freight yard from the construction of the Crewe IMD and HS2 links to the WCML will presumably be taken into account when determining the preferred Design Refinement.
The section also claims that Phase 2a would create extra capacity at stations between Handsacre and immediately south of Crewe, but what does this mean? The only such stations are Rugeley Trent Valley, Stafford and Norton Bridge. There is no need of extra capacity at Rugeley Trent Valley and Network Rail are proposing to make the closure of Norton Bridge permanent. If this therefore refers only to Stafford it would be better to make that clear.

3..3.17 IWA welcomes the inclusion of the Canal and River Trust in consultations. However it will be necessary for HS2 Ltd to permit, encourage and facilitate these stakeholders to communicate in both directions between HS2 Ltd and their own stakeholders to get issues aired and addressed, rather than to place them in the invidious position of being bound by confidentiality and unable to communicate anything.

4.1.2 There seems little point in including Crewe Station background when this scheme is not making any changes to the station, or railway into it.

4.4.3 is worryingly vague on whether there is going to be any work on a station or hub at Crewe in time for the opening of this Phase 2a. Is this just a short term situation, or is it likely to extend beyond the deadline for the EIA?

4.5.10 confirms that trains will operate at speeds up to 360kph. Trains will not travel at the higher 400kph speed according to this section unless it can be demonstrated that these speeds do not create 'additional significant environmental effects'. Are these additional significant environmental effects over and above those identified here, or additional to those currently existing? There appears a risk of 'environmental effect creep' in this further speed increase.

4.5.20- Is it fair to assume these operations will occur wherever the IMD is placed?

5.2.3 & 5.10.2 If the Pipe Ridware maintenance loop is not constructed, presumably there will not be an increase in width beyond 2 lines here.

5.3.3 States that in general, embankment slopes will be 1:2.5 but Figures 7 and 8 on the preceding page show slopes of 1:2.0. Suggest these need aligning!

5.12.3 & Figure 16- This is not a representative noise fence barrier, but one approximately 5m high. The average noise fence barrier seems by inspection around 2-3 m high and an illustration of one that size would be better.

6.3.44 Construction noise and vibration should, in IWA's view, be mitigated in accordance with government's NPSE 2010, in the vicinity of canal crossings and close passings where boats may be exercising their residential rights. This will require the area to have noise reduced below the SOAEL to prevent boaters being exposed to adverse effects during their stay.

6.4.6 & 6.4.8- Creating habitat and moving species in advance of works starting on this phase will require significant effort given the overall timescale.

7.4.7 says that the effects of overlapping construction of phases 1 and 2a around Fradley is being carefully considered. The works here need to be integrated so as to minimise any disruption to canal users.

8.8.5 identifies the potential for establishing a profile for health in a community. However on inland waterways there are communities which move around, in their boats. These communities will be affected by noise and vibration. How will the project reach these people and assess their health and the impact of HS2 on it? This may be more appropriately done on a route- wide basis than CA by CA, and needs some consideration.

8.10.4 It is interesting to see 10m as a minimum depth for tree screens. Is this a universal measure to be deployed, and will screens provided by HS2 be thicker than this?

8.11.10 in discussing the major accidents and natural disasters assumptions has as a key assumption that only 'feasible' source-pathway-receptors are being considered. Surely major accidents and natural disasters often occur as a result of unlikely combinations, and therefore defaulting to the 'expected', whilst easier, will defeat the purpose behind this proposal? A much more challenging process is needed.

8.13.11 sets out government expectations on noise, to which IWA wants to see adherence. Inland waterways where users whether anglers boaters or other users may be expected to remain for a period of time- such as several hours fishing, or several days moored up residing should be protected to levels below the NPSE SOAEL using BPM technology, either on the trackside or on the rolling stock.

8.13.20 identifies improvements in rolling stock noise. However there is some literature reporting better measurement of emissions from rolling stock, showing that aerodynamic noise and overhead pantograph and equipment noise nuisance is now at a similar level to that from rolling machinery at high speeds such as intended here for routine operation, and items such as aerials and protruding items can create very high levels of noise nuisance. There is relatively little on East Asian experience?

There is also the suggestion that 'averaging noise' does not work well when measuring the effect of noise nuisance for receptors of frequent high speed railway noise.

9.11.4 It is good to see landscape mitigation being considered 'at a strategic scale with consideration given to the route alignment and the horizontal and vertical levels required to reduce landscape and visual effects'. This will be picked up later in CA comments.

9.14.7 identifies reduction of noise nuisance by ' keep[ing] the route alignment as low as reasonably practicable and away from main communities.' This is very much IWA's view after our experience with the Fradley crossings in Phase 1.

9.14.8 mentions again 'proven East Asian technology' however again there is no reference to back up this assertion. Please provide the data to back this up- noise is a key issue for most people.

9.14.15 Please see our comments above (6.3.44) on noise and government's NPSE document.

## Volume 1 Appendix: Alternatives Report

4.1.19 outlines the work done by HS2 Ltd updating standards of design for the Phase 1 and 2 routes aimed at optimising passenger comfort. However it is not necessarily sensible to propose such standards if the consequence is significant impact on the environment and inhabitants around the route. There appear to be several examples of this in the Community Areas in Phase 2A.

Table 10- from an inland waterways protection point of view, this table confirms the choice made is better than the alternative via Stoke on Trent in minimising the impact.

6.2 CA1 Fradley to Colton

6.2.1 & 2 sets out the situation on the lengths of viaduct around the Bourne Brook and River Trent, stating that the modelling has not yet been completed. However since the first sections were available in this area the hieghts of viaducts and embankments have been increased significantly, contrary to the 'mitigation' set out in Volume 1 for noise and visual

intrusion. The need for these height increases, despite absence of modelling, is unproven and will be challenged in CA1 below.

The section also does not mention or seek to justify the two proposed public road closures of Common Lane and Shaw Lane, which are confirmed in the CA1 report.

6.2.16 & 17 states that the review in November 2015 required a 'constant gradient' as the railway moves from viaduct to cutting or embankment, however it does not say why this is necessary. Having a loop to park a train in seems a poor reason for expending significant money on building a higher embankment, and creating major noise and visual intrusion. IWA will support moving the Crewe IMD to Stone (6.4 below), both because it has other benefits elsewhere and because it should remove the need for Pipe Ridware maintenance loop and its apparently inflated route height.

6.3 CA 2 – Colwich to Yarlet- There is no explanation why the viaduct and embankment across the Trent valley at Great Haywood has been significantly increased in height.

6.6 CA5 South Cheshire- Moving the IMD from Crewe to Stone, and altering the connections to the WCML to allow easier operation of the existing railway during construction of HS2 seem sensible and lower cost proposals. There are (as above) other benefits from an inland waterways perspective especially if the Pipe Ridware maintenance loop is removed.

## Question 3: Comments on Community Area Reports

IWA has comments on the following Community Areas:

- CA 1 Fradley to Colton
- CA2 Colwich to Yarlet
- CA3 Stone and Swynnerton
- CA5 South Cheshire

## CA1 Fradley to Colton

The downloaded Pdf of CA1 mapbook CO7 V4 runs to page 75 (WR-01-202a) then repeats to p 129 (WR-01-202a again). This file is unnecessarily large at 78Mb- has anything been missed off by this unnecessary duplication?

The first part of this section is elevated- a total average increase in height over ground levels by embankment or viaduct of 11.3m. This is unnecessary, apparently just undertaken to 'smooth' the descent and rise from the T&M Canal crossing to the Pipe Ridware maintenance loop as the route crosses the Bourne and Trent floodplains. This major engineering will be costly, and create excessive visual and noise intrusion in the landscape. The rail route should be dropped significantly to a minimum needed for the road crossings and to avoid the flood plain risk of the Bourne Brook and River Trent. Spoil could then be

used as highlighted in Vol 1 mitigation, using 'shoulder' embankments to mitigate noise and visual appearance over a wide area.

The second half of the section has gradients and balance of cut and fill which more closely follows the land form, although without taking the opportunity to keep the rail route low in the landscape to minimise noise and visual intrusion.

**Description of the proposed scheme**

Fradley Wood to Woodend culvert

2.2.10 Refers to the route north of Fradley Wood gradually returning to a height above ground level of approximately 2m but the profile section on drawing C861-ARP-CV-DPP-000-012001 shows the height in this area as 4.5m.

2.2.17 Refers to a noise fence barrier approximately 3m in height beginning at Bourne Brook viaduct but the Operational Sound Contour Map SV-01-102 shows this as up to 2m height.

**Route Section Alternatives**

Bourne Brook viaduct and River Trent viaduct

2.5.8 Says Option A1.1a would reduce the requirement to divert roads, however it would also avoid the need to close Shaw Lane.

2.5.10 Refers to a need to lower the alignment of the existing A513, but having been raised the height of the route greatly exceeds the headroom needed at the existing road level.

**11. Landscape & Visual**

11.4.13 This describes the visual impact of the construction of Pyford Brook viaduct and embankments on views north from the Trent & Mersey Canal, somewhat confusingly, as "potentially major adverse potential visual significant effects".

11.5.14 & 15 After completion there would still be potentially major adverse significant visual effects which would largely remain after 15 years.

To mitigate these effects additional landscape planting should be undertaken as soon as possible before the start of construction.

**13 Sound, noise and vibration**

As well as showing the proposed lengths and height of noise fence and landscaping barriers on Phase 2a, the Operational Sound Contour Maps SV-01-101 and SV-01-102 show an overlap with the Phase One works including noise barriers across the canal overbridge on the Manchester Spur. Although no height is given, this provision was not previously clear on

the AP2 plans (SV-05-063) which only showed a symbol confusingly labelled “Engineering, e.g. cuttings” across the bridge.

Whilst welcoming this clarification, it is apparent from the noise contours that stopping the noise fencing at the ends of the bridge structure and not continuing it some way onto the adjacent embankments allows higher noise levels to ‘spill over’ around the ends of the bridge resulting in higher than necessary noise impacts on the canal close to and for some distance either side of the bridge. This section of the canal has permanent boat moorings and the noise barriers should therefore be extended.

Although this is technically on Phase 1, the construction of both phases in this area is likely to be simultaneous (see 7.4.7 below) and this also raises an important issue common to many other canal bridge and viaduct crossings on both phases 1 and 2a and on future phases. It is important in all cases that noise fence barriers across bridges and viaducts do not simply terminate at the end of the built structure but are continued an appropriate distance onto the adjacent earthworks to avoid the spillage of noise around the ends and to integrate with any landscape barriers such as false cuttings.

Up to Chainage 191, the Trent & Mersey Canal is within 1 km of the main line, running parallel. With the viaduct/ embankment levels higher than before, noise and visual intrusion will be significant to the north east.

At Chainage 192 the route runs back on viaduct over the River Trent floodplain to Chainage 193.75 approx. then onto embankment and the start of the possible Pipe Ridware maintenance loop (which may be replaced by a possible Stone railhead/ maintenance loop/IMD).

## CA2 Colwich to Yarlet

This CA has a 16m high viaduct extended past Great Haywood Marina. The viaduct now starts behind the WCML, improving access and the openness and visual impact of the previously planned embankment alongside the marina. However it seems unnecessarily high.

Once over the Trent & Mersey Canal, the route runs parallel to the canal and about 2km west of it as far as Stone.

### Great Haywood Marina and the Trent & Mersey Canal

### Previous Information and Consultations.

The first plans for the HS2 line to Manchester, published in 2013, did not show Great Haywood Marina and it seems that the initial route selection for this section of the line was made without taking any account of its existence.

IWA responded to the Phase 2 Route Consultation in January 2014 (by emailed letter, our ref: CPHS2-Phase2 of 20/1/2014) pointing out that the rail embankment then shown intruded on the northeast corner of the marina basin, cutting off access to 64 of the 200 berths and also destroying a line of mature trees and part of an environmental area. That would have effectively destroyed the marina business and seriously damaged the associated brokerage business, boatyard and farm shop. IWA asked that the railway alignment be moved at least 30m north to avoid the marina. As an absolute minimum, the embankment should be replaced by an extended viaduct which would have a narrower footprint to maintain access to the moorings. However, boats in the marina are partly used residentially and the noise impact would be very damaging so noise barriers to the highest possible design standards should be provided.

In November 2015 the Government decided to advance construction of Phase 2a Fradley to Crewe by 6 years. The Summary of Route Refinements recommended an extended viaduct replacing the partial embankment alongside Great Haywood Marina, to improve access. However, there was no mention of noise barriers.

**Present Consultation**.
The Working Draft Environmental Impact Assessment report and plans provide more detail about the proposed scheme, the construction phase, heritage, visual and noise impacts. Previous concerns about the access to moorings within Great Haywood Marina are partly resolved, but noise impacts on the marina and the Trent & Mersey Canal are not adequately addressed and additional concerns are raised about noise impacts on the marina at Hoo Mill.

**Access.**
Plan CT-06-212 shows the Great Haywood Viaduct crossing the Trent & Mersey Canal, running alongside Great Haywood Marina and bridging the Colwich to Macclesfield railway. It now appears that on completion the present pedestrian and vehicle access to the mooring pontoons on the north side of the marina and most of the present car parking areas will remain accessible. However, plan CT-05-212 shows that part of the overflow parking area will be required during construction. It is not clear how many of the existing trees will have to be removed for construction and what replacement planting will be provided.

**Viaduct Height**.
The HS2 viaduct crosses the existing railway, which is already on embankment, and on the 2015 plans was shown as 12.3m high where it crosses the Trent & Mersey Canal. However,

it has now been raised to 16.5m at that point without any explanation, making it even more visually intrusive and potentially radiating noise over a wider area.

**Heritage Impact.**
The draft EIA describes the impact of the Great Haywood Viaduct on the designated heritage asset of the Trent & Mersey Canal Conservation Area and the setting of its Listed bridges from both the construction phase and its permanent use as a medium adverse impact (Report paras. 7.3.5, 7.4.8, 7.4.24, 7.5.6).

**Visual Impact.**
The draft EIA describes the visual impact from pile driving and construction of the Great Haywood Viaduct on views from the Trent & Mersey Canal as potentially major adverse (significant) visual effects (11.4.16). This would remain the case on completion and after 15 years (11.5.14, 11.5.15) with major adverse visual effects in relation to recreational receptors at Hoo Mill Lock and on the canal by Great Haywood Marina (11.5.28).

But whilst the heritage and visual impacts are considered in the draft EIA there is little or no discussion or consideration of the construction and operational noise impacts on the canal and the marinas other than by implication from the Sound Contour Maps.

**Construction Noise.**
A main construction compound off the A51 is now revealed which would be operational from 2020 for 6 years and 9 months (2.3.25). This is just across the existing railway from the boatyard and mooring basin at Hoo Mill and could have a significant noise impact on the moorers and users of this facility, the Trent & Mersey Canal and the residents of Hoo Mill Lock Cottage. However, there does not appear to be any assessment of this or any proposed mitigation. The provision of temporary noise fencing along the existing railway embankment should be considered to minimise noise impacts from the compound.

It is not stated when or for how long construction of the viaduct adjacent to the marina will take place but it will clearly create a major noise impact on the marina and should be programmed to minimise the period of disturbance. It is also not clear how the construction site between the existing railway line, the canal and the river is to be accessed from the Main Compound. Hoo Mill Lane with its limited width, low railway bridge and narrow Grade 2 listed canal bridge is clearly unsuitable for heavy construction vehicles. If temporary bridges over the canal and river are proposed they should be shown on the plan. The height required to bridge the existing railway would make any such bridge visually intrusive and its use by construction traffic would further add to the noise impacts on the canal and marinas, depending on its location.

**Operational Noise.**

There will be up to 24 trains per hour when the full Phase 2 route is operational (2.4.2) or one every 2½ minutes on average. The Operational Sound Contour Map (SV-01-107) indicates fence barriers on the south side of the viaduct up to 2m high with a bund or barrier on the adjacent embankment beyond the existing railway at up to 3m high. This results in predicted daytime sound levels of 55 to 60dB across Great Haywood Marina.

On the north side the 2m barriers unaccountably stop just beyond the canal crossing resulting in a 'spill over' of higher noise levels of 60 to 65dB affecting the Trent & Mersey Canal north of the viaduct with 55 to 60dB extending as far as the Hoo Mill marina. Clearly, the noise barrier should be extended on the north side of the viaduct up to and some way onto the embankment to provide equivalent noise reduction as for the south side in order to minimise adverse impacts on the users of the canal and Hoo Mill marina.

However, the 55 to 60db level across Great Haywood Marina is not considered acceptable for the following reasons:

**Residential Receptors.**
The Sound Map marks a non-residential receptor at the workshop building in the marina but the EIA fails to recognise the residential managers flat in the adjacent office/reception building.

Moreover, there has been no recognition of the residential use of the boats on the canal and in the marina. Almost all canal boats are used residentially, both when under way on a voyage and frequently when moored on the canal or in a marina. Owners will often stay on their boats, using it as a country cottage overnight or for a weekend, or sometimes for longer periods for a variety of reasons, without moving from their marina or moorings along the canal. Whilst there are no licensed permanent residential moorings in Great Haywood Marina, with up to 200 boats there will be at any one time several being used residentially.

Therefore, the marina should be afforded at least the same standard of noise mitigation as for residential buildings. The 'at least' qualification is because boats, due to their construction, have inherently less noise insulation that buildings and because of their mobility cannot realistically be retrofitted with double glazing. Boat users are therefore dependant on external noise controls which in this case must mean a higher standard of noise fencing.

**Noise Fencing.**
The proposed noise fencing on the viaduct up to 2m high would shield only the wheel noise and not aerodynamic or pantograph noise sources. Elsewhere, fencing or bunds of 3m, 4m or 5m are proposed where needed near residential property. It should be possible to

provide higher fencing across viaducts, even if the bridge deck may need to be slightly wider to accommodate supports.

**Overall Noise Assessment.**
The Sound Maps predict noise from HS2 in isolation, and are based on a form of averaging, but what is important to residents is the increase from existing noise levels and the intensity and frequency of peak noise levels. It is recognised that with the existing railway line alongside, the marina already suffers some noise disturbance, but any significant increase would adversely affect its commercial viability. There needs to be a site specific assessment of the total noise environment, existing and predicted, to determine the extent of additional mitigation measures needed here to avoid any significant increase and to meet residential noise guidelines.

13.5.25 states 'Map Series SV-01 shows the draft list of non-residential locations to be considered in the sound, noise and vibration assessment as part of the formal EIA Report. This list will be developed further incorporating consultation feedback and ongoing stakeholder engagement'. IWA considers, for the reasons given above, that Great Haywood Marina needs to be added to this list, along with other lengths of the Trent & Mersey Canal.

**Business Impact.**
Failure to provide improved noise mitigation could have serious impacts on the marina and its associated businesses, leading to financial compensation claims. At present the marina enjoys a very high occupancy rate with vacated berths soon filled, but if either the construction or operation of HS2 is unduly intrusive then boaters will move elsewhere. As well as the moorings, workshop facility and brokerage business within the marina, the closely associated businesses include a fruit farm, farm shop and a café which together employ 30 to 40 people but would lose some of their trade if the attractiveness of the marina is damaged.

## CA 3 Stone and Swynnerton

The route continues running broadly parallel with the Trent & Mersey Canal, at its closest coming 1.5km away near Meaford Locks before the route turns away crossing the M6 and heading to the west of Stoke.

There are no impacts on the canal presently envisaged. There is planned to be a railhead where the existing railway between Norton Bridge and Stone intersects the route just north of the Stafford Services on the M6. Further work is going on to see whether it is possible and beneficial to reinstate this area in the form of an infrastructure maintenance depot (IMD) instead of the one currently planned south of Crewe. If this IMD goes ahead here, the maintenance loops at Pipe Ridware may not be required or built. IWA supports the positioning of the IMD at Stone, and the removal of the maintenance loops at Pipe Ridware.

## CA5 South Cheshire

This final section of Phase 2A runs to the west of Newcastle under Lyme before heading NNW and ending at the southern portal of the tunnel into and under Crewe. After crossing the WCML in the previous section, the route stays within around 0.5km of that line before joining it halfway through the section and running up to the southern outskirts of Crewe.

After dropping down for the first half of the section, the route levels out towards Crewe where it dives down in preparation for entering the tunnel under parts of the town.

The section currently includes links to the WCML and provision of an infrastructure maintenance depot (IMD) just south of Crewe, however both are further reviewed in the Design Refinements consultation. The WCML links are being reviewed to reduce interference with Network Rail's freight and passenger operations, and the IMD could be moved to Stone. These changes could significantly affect most of the proposals in the second half of this section.

IWA supports the potentially beneficial move of the IMD to Stone, resulting in the removal of the maintenance loops at Pipe Ridware. Other than this there are no impacts on inland waterways presently envisaged.

## Consultation Question 4: Comments on Volume 3 Route Wide Effects

For canal users, noise is a route wide issue and will be experienced by individual users, as well as canal users in combination, as a route wide effect.

Visual effects are also route wide due to the number of canal crossings and close passings.

6.1.3 Cultural Heritage refers to two conservation areas significantly affected but should also include the Trent & Mersey Canal Conservation Area. This also needs correcting in Table 21 on page 92.

8. Health- nothing new has been provided in this working draft, however IWA expects to see a response on health impacts of noise more in line with the 2014 EU EIA Directive and UK government's 2010 NPSE. This will not align with HS2 Ltd's wish to ignore what it calls 'transient receptors' and IWA considers legitimate canal users who are often residential for their period of use, whether out on the canals or at their home mooring.

8.4.1 Claims (as in Vol 1) that vertical alignment has been designed to reduce visual and noise intrusion as far as reasonably practicable. However, these plans significantly increase the heights of the viaducts and embankments across the Trent valley north of Fradley and at Great Haywood without explanation, which contradicts this.

11.4.1 As IWA has commented in Vol 1, this section appears to miss the purpose of EU's directive on EIAs. Table 3 Key Definitions repeats this- for example, in 'Major accidents and /or natural disaster events' the definition should state 'requires' rather than 'triggers' to avoid any suggestion that this will be under HS2's control.

Table 3 Risk event- 'environmental receptor' is an odd way to describe members of the public who may also be railway users, or live near to the route.

11.6.3 makes no mention of aircraft strike, yet this must be a realistic major event with low likelihood but major consequence whether military or civilian origin.

Table 4 seems unduly complacent given this is a major incident appraisal.

Table 5- does design take into account surface flooding from external sources, arising as surface water takes new routes as is seen on a smaller scale within urban areas, but can exist at larger scale due to for example intense rainfall in some catchments? There have been several recent incidents involving fluvial flooding as a result of extreme intense weather, where flooding has been a first time occurrence.

## IWA General Principles for Protection of Waterways Impacted by HS2

The following principles with respect to waterways need to be applied to HS2's proposals for phase 2a:

- Protection of Routes – No canal should be lost or blocked, whether a restoration project or a navigation in use, and where the route crosses a waterway, the waterway should be restored to a minimum of navigation standard, whether the navigation is presently extant or not.
- Navigation – There should be minimal disruption to navigation during the construction phase, and any necessary impacts should be integrated with the navigation authority's planned stoppage programmes.
- Waterway gauge - there should be no detriment to the constructed gauge of any waterway due to HS2, particularly in respect of headroom, taking account of any proposed enhancements on freight waterways. Any waterway crossings or other alterations to the waterway should comply with the appropriate navigation authority's policy of headroom over water, over towpaths, and on minimum width.
- Mitigation – wherever possible mitigation should be completed in advance of construction.
- Betterment – opportunities should be sought to achieve betterment for waterways within the planning process as compensation for environmental and heritage damage caused by HS2's construction and operation.

## IWA Position on Noise Affecting Waterway Users

UK government noise policy sets out three aims, the first of which is to 'avoid significant adverse impacts on health and quality of life.' The policy states:

' any receptor forecast to experience an absolute 'end state' exposure from the source that exceeds the relevant SOAEL [Significant Observable Adverse Effect Level] should be identified as being subject, in EIA terms, to a likely significant adverse effect. This would reflect the aim to avoid significant effects on health and quality of life.'

In the Environmental Statement accompanying the Phase 1 Hybrid Bill, noise appendices set out upper limits for the SOAEL for the project by reference to WHO and UK Noise Insulation regulations:

'For night-time, the World Health Organization's Night Noise Guidelines for Europe21 introduced an Interim Target of 55 dB $L_{PAeq,8hr}$ measured outdoors. This is the noise threshold used for category 'C' of the ABC impact criteria at night (refer to section 14 of the SMR) and again can be taken to be a SOAEL [significant observable adverse effect level] During the daytime the free-field level of 65 dB $L_{pAeq,0700\text{-}2300}$ is considered a SOAEL. This is consistent with the daytime trigger level in the UK Noise Insulation (Railways and other guided systems) Regulations...'

It then quantified change in noise levels as another aspect of sound from the project which can be identified by receptors as noise, by reference to the table below:

Table 7: SMR Table 33 Airborne sound from operational train or road movements - impact criteria

| **Long term Impact Classification** | **Short term Impact Classification** | **Sound level change dB $L_{pAeq,T}$ (positive or negative) T = either 16hr day or 8hr night** |
|---|---|---|
| Negligible | Negligible | ≥ 0 dB and < 1 dB |
| Minor | | ≥ 1 dB and < 3 dB |
| Minor | Moderate | ≥ 3 dB and < 5 dB |
| Moderate | Major | ≥ 5 dB and < 10 dB |
| Major | | ≥ 10 dB |

Annexes set out the basis for modelling sound generation and transmission from HS2 by reference to HS1, and academic papers on European high speed trains. From these, a maximum noise level within 15m of an HS2 train is indicated as >90dB and <100dB.

However the appendices consider users of such facilities as Public Rights of Way and locations that have temporary and static moorings or permit occasional overnight stays such as static moorings, camp sites or caravan parks but do not permit long term residential use, as transient receptors. Users of such facilities are not considered to be significantly affected by noise due to construction or operation of the Proposed Scheme due to the short and

irregular exposure to noise from the Proposed Scheme. Permanent moorings are however treated as residential, whilst allowing for the lower sound insulation provided by the 'shell' of a boat compared to a house.

On this basis, HS2 expects (amongst others) waterway users whether on boats or towpaths to be exposed to levels of noise above the project-determined SOAEL of 65dB (daytime) 55dB (night time), or a 'Major' change in noise levels of ≥5dB because the impact will be transient. In practice these levels could be as high as >90dB for a boat or towpath user passing under a low bridge whilst a train passes overhead, and represent a change in sound pressure of over 20dB. This is considered acceptable by HS2, despite the context that without the project going ahead waterway users could still enjoy the current absence of noise without detriment, and in many locations no attempt has been proposed to reduce noise levels with best available technology despite the UK Government's stated policy on noise pollution '… to avoid significant effects on health and quality of life.'

It is IWA's position that this is not acceptable, and further 'best available technology' engineering and mitigation effects must be deployed at canal crossings and in the vicinity of marinas, short and long term moorings to reduce transmitted noise as far as possible towards and below the SOAEL level. This would move towards the UK Government's Noise Policy Aims for a:
'…situation where the effect lies somewhere between LOAEL and SOAEL. '

The UK Government policy aims do not differentiate between residential, non-residential and temporary receptors in the arbitrary way the Environmental Statement does.

## Waterway Design Principles for the HS2 Project

HS2 will have a significant number of interactions with and impact on waterways as it is constructed and moves into operation. In IWA's experience, these impacts can be significantly improved by good thoughtful design as can the operability and maintainability of the structures both for the railway and the waterway. Canal & River Trust have taken a lead in documenting a series of 'general design principles that guide the post-planning development of HS2 design within the corridor of the waterways.' IWA is very supportive of this work, and believes use of these Design Principles will facilitate good design within the waterway context. Use of these principles should be a requirement of designs with a waterway interface and impact.

Ends.

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