

Comments to Oxford City Council on the Noise Scheme of Assessment (NSoA) for Route Section H of East West Rail

Communal comments from some concerned residents of Upper Wolvercote and Lakeside - see list given at the end. Abbreviations used are listed below¹.

Summary

- (1) The NSoA shows that noise from EWR trains has the potential to become a major blight on the lives of hundreds of residents of Upper Wolvercote and Lakeside.
- (2) Noise predictions in the NSoA show that dozens of properties will suffer high noise impacts; yet even these may be under-predictions, as no allowance is made in the NSoA for uncertainty in the predictions – ERM’s own data show this could be 5dB with a further 3dB near the S&C.
- (3) In spite of (1) and (2) above, the EWR scheme as currently proposed in the NSoA refuses to honour several important commitments made in the NVMP (in breach of the TWA Order): most notably, the commitments to give priority to at-source noise mitigation, to design the scheme to minimize noise-amplification from switches and crossings, and to provide noise monitoring after full implementation of EWR.
- (4) We are pleased that the IE has carried out checks of the NSoA noise calculations, but unfortunately his report RIE is incomplete: he does not comment on the shortcomings of the NSoA referred to in (2) and (3) above.
- (5) In view of (2) and (3) above, it is clear that the NSoA does *not* provide a robust demonstration of compliance with Condition 19 with respect to noise. Therefore changes are needed to Section H of the EWR, before it would be justifiable for Oxford City Council to discharge Condition 19 with respect to noise in this Section.
- (6) Changes to the EWR scheme in Section H that could increase compliance with Condition 19 with respect to noise would be:
 - (i) Significant reduction of train speeds in Section H.
 - (ii) Employment of rail dampers throughout Section H.
 - (iii) Removal of the Bladon Close set of points, away from houses and the school.
 - (iv) Addition of a second noise monitoring programme after completion of the scheme and full introduction of all the EWR trains.

¹ East West Rail Phases 1, 2A and 2B (EWR); the Noise Scheme of Assessment for Section H, as submitted to Oxford City Council 24 March 2015 (NSoA); the draft Noise Scheme of Assessment for Section H as published for public consultation in December 2014 (dNSoA); the noise Independent Expert (IE); the report of the Independent Expert (RIE); Oxford City Council (OCC); the Noise and Vibration Mitigation Policy (NVMP); the Evergreen 3 Environmental Statement (ES).

1. Background

Many properties in Section H will be badly affected by noise from the trains after implementation of the EWR scheme – at least 150 homes *and* Wolvercote Primary School. Noise from the EWR scheme as currently proposed will significantly degrade Upper Wolvercote and Lakeside as desirable places in which to live.

The *only* statutory protection for residents, from the train noise causing even more damage to this part of Oxford than envisaged by the Secretary of State in making the TWA Order, is Oxford City Council's obligation to insist on the railway companies' compliance with the letter of the conditions attached to the TWA Order.

The purpose of the NSoA is to demonstrate that the EWR scheme will satisfy Condition 19 of the TWA Order, in relation to the noise caused by trains operating in Section H of the scheme. Condition 19 requires implementation of the Noise and Vibration Mitigation Policy (NVMP). Therefore we look to OCC not to discharge Condition 19 until it is unambiguously clear that the NVMP will be implemented in full.

2. The high levels of expected train noise

Consistent with the NVMP, the NSoA contains many predictions of future noise levels, and of the change in noise levels compared to the recent past (before commencement of works on the railway). Several measures of noise are used: average noise level $L_{A,eq}$, and maximum noise level $L_{A,max}$. Predictions reported in the NSoA were computed using a commercial software suite – SoundPlan - that is said to take account of terrain topography and reflections and shielding from noise barriers and buildings etc. Input data for the software included predictions of expected train traffic and of actual train speeds in Section H. The L_A measures output from the software are compared with various numerical criteria to decide entitlement to different forms of sound propagation-path mitigation (noise barrier or sound insulation).

Some L_A predictions are presented in the form of a sound contour map of Section H – see Figure 5.1 of the NSoA. It is immediately clear from this map that *Upper Wolvercote and Lakeside will be extremely vulnerable to train noise from EWR as currently proposed*. For example, one contour shown is for $L_{A,max,8h}$ (maximum night-time noise) = 82dB – a similar contour can be expected for daytime. This is recognized to be a 'high' peak in noise: e.g. approximately the noise of a freight locomotive, at its noisiest, at only 25m distance (see NSoA p.D23). Although, where houses experience this level of $L_{A,max,8h}$ noise insulation will be offered, this leaves gardens exposed. In Section H, even after implementation of the noise barrier mitigation proposed, there will remain some 98 homes where all or a significant

portion of their garden will be blighted by regular noise peaks at this level or higher, even up to 93dB; and the same applies to more than a quarter of the playing field of Wolvercote Primary School. There are properties and gardens predicted to suffer noise peaks at this high level along the whole length of Section H. Moreover, there are 68 homes where at least a portion of the garden is predicted to suffer an average noise level $L_{A,eq}$ in excess of 55dB, which is considered the upper guideline figure for outside amenity areas by the World Health Organisation² and the relevant British Standard³. Such figures emphasise the potential for damage to this part of Oxford, and the need to take every possible step to reduce EWR noise in Section H.

3. Noise levels could be even higher than predicted

Unfortunately, there is a reasonable likelihood that noise levels could be higher even than this, because of uncertainty in the noise prediction method, ignored in the NSoA. There are at least three sources of uncertainty.

- The computational model in SoundPlan, as with all such numerical models, has a finite spatial resolution and hence uncertainty in its predictions. An illustration of this is provided by the difference in outputs provided by the two implementations of SoundPlan quoted by ERM: calculations for the dNSoA using SoundPlan version 7.1; and calculations for the NSoA using SoundPlan version 7.3. Across all the receptors listed in Table D4.2, the difference in $L_{A,max,8h}$ predictions, for example, *for the same location and the same input parameters*, is 2.0 ± 1.5 dB. To allow adequately for uncertainty from this source at the 95% confidence level would require addition of 5dB to all $L_{A,max,8h}$ predictions.
- The Nord2000 model used in the NSoA to compute $L_{A,max,8h}$ takes no account of noise amplification near switches and crossings (S&C). However, the Environmental Statement (p.61) warns that, near S&C, train noise levels increase by 3dB. Thus noise levels at buildings near the Bladon Close points (especially 3 Bladon Close and 4 Bladon Close) can be expected to be 3dB higher than claimed in the NSoA.
- The assumptions it makes about future freight trains are not robust – i.e. do not convincingly represent a ‘reasonable worst case’. The NSoA assumes that the usage of available freight paths will never be greater than only 50%, on the basis that this is approximately the *current average* usage around Oxford. Also it assumes that there will be a maximum of only two stone trains per day (approaching Water Eaton at only 20mph), and never any at night. But it is wholly implausible that these assumptions will be valid years into the future,

² World Health Organisation ‘Guidelines for Community Noise’, 1999.

³ BS 2833:2014 ‘Guidance for Sound Insulation and Noise Reduction for Buildings’, 2014.

until and beyond full implementation of EWR. A factor unique to EWR, that makes these freight forecasts especially unrealistic, is that the EWR line has been officially earmarked to supply all the ballast and other supplies to the Infrastructure Maintenance Depot at Calvert⁴, for construction and maintenance of HS2. There is no doubt that many of these will be carrying ballast (i.e. they will be noise-intensive ‘stone trains’), and they will not be stopping at Water Eaton so they will be travelling at speeds much higher than 20mph in Section H. Moreover pressure on the freight paths, especially during the ten years or so of HS2 construction, will mean they are likely to run at night, potentially causing $L_{A,eq}$ noise levels to greatly exceed the NSoA’s predictions⁵. Thus, a more suitably cautious approach would assume that on the noisiest day or night *all* freight paths are used. It would increase predicted $L_{A,eq}$ noise levels by approximately 3dB⁶ from those given in the NSoA.

4. Failure to propose noise mitigation at source

The NVMP, and before that, the Environmental Statement (ES), both produced by ERM, place great emphasis on a commitment to mitigate vibration and noise ‘*at source*’ (i.e. at the train and the rail). The NVMP Summary promises the Policy ‘*will ensure...noise will be reduced at source where it is reasonably practicable to do so*’. The NVMP also says ‘*trackforms will be developed and installed.*’ to this end (a point repeated by representatives of ERM at both public inquiries). And the ‘*first preference will be to apply necessary noise control measures at source where this is reasonably practical*’: these ‘*may include rail damping or other infrastructure measures*’. On this understanding, the TWA Order was granted by the Secretary of State.

But, the TWA Order now having been made, the NoSA, also produced by ERM, *rejects* all forms of noise mitigation at source.

Various technologies could have been considered. The most promising appears to us to be installation of Tata Steel SilentTrack rail dampers, which the manufacturers claim achieve 3 – 7dB attenuation of noise generated at the rail. This is equivalent to a reduction of 50% - 80% in noise power reaching receptors. It would clearly be a very helpful step in mitigating the problem of EWR train noise in Section H. The only substantive explanations for rejecting these, given by ERM in the NSoA and to us directly in response to our comments on the dNSoA, concerned the cost and inconvenience to Network Rail. In our view they are inadequate reasons for renegeing

⁴ HS2 Ltd, HS2 Information Paper “F2: Infrastructure Maintenance Depot Strategy”, 2014.

⁵ All track-side residents in Wolvercote are familiar with the noise and vibration from stone trains going to Water Eaton in recent weeks, even very late in the evening. So it is clear there is no logistical problem preventing stone trains running during the night.

⁶ Approximating night-time noise as being dominated by that from freight trains.

on the commitment made previously in the NVMP to give priority to at-source mitigation.

5. Failure to ameliorate noise from Switches and Crossings

Another commitment made by ERM in The Evergreen 3 Environmental Statement, also used as part of the evidence on which the TWA Order was granted, is as follows (see P.6-61).

‘Design measures will be taken to ensure that, as far as possible:

- *S&C are located away from noise sensitive properties; and*
- *Appropriate S&C designs are used.’*

In relation to the re-location of S&C, ERM in the ES say *‘there is a degree of flexibility in the choice of their location’*. In relation to the use of low noise S&C, ERM in the ES say *‘Careful selection of appropriate S&C units can help in reducing noise, and modern S&C technology results in noise levels little greater than on plain line’*.

But, once again, ERM in the NSoA fail to honour the commitments.

The set of points planned to be adjacent to the end of Bladon Close will cause significant amplification of noise, and hence increase in L_{Aeq} and L_{Amax} noise levels - although this is not reflected in the predictions of $L_{A,max}$ given in the NSoA, since the calculation method does not include contribution from the switches and crossings, see above (Section 3). The affected properties - especially numbers 3 and 4 Bladon Close - are, even without this amplification, among the worst sufferers from noise nuisance (and vibration) in the whole of Section H. Nevertheless, the NSoA does not suggest re-locating the points. ERM’s response to our comments on the dNSoA refers to *‘constraints’* on the re-location that make it not feasible.

Moreover, the NSoA even rules out the use of crossings of ‘low noise’ design. The NSoA gives as the reason for this that *‘they (i.e. low noise designs of S&C) are not available for use on heavy rail schemes’*. In ERM’s response to our comments on the dNSoA, they even go so far as to say *‘these do not currently exist for heavy rail systems’*.

Thus it is unclear what *‘appropriate S&C designs’* were being promised by ERM in the 2009 Environmental Statement, that are now (after making of the TWA Order) claimed by ERM in 2015 not to exist.

6. Failure to honour fully the commitment to noise monitoring

A further commitment in the NVMP is to programmes of noise monitoring: at 6 and 18 months after the opening of *passenger* services; and a further programme of 6 and 18 month monitoring after the completion of phase 2B and when the EWR trains are all running. The NVMP states: *'If defects in construction or performance are identified in the first survey, these will be corrected in a timely manner by the contractor. If any defects in construction or performance are found in the second survey these will also be corrected in a timely manner by the contractor. The same procedure for post construction monitoring surveys and the remedy of defects or performance will be undertaken after the Phase 2B works have been completed and EWR services introduced.'*

However, again, ERM in the NSoA (P.32) fail to honour the commitment. Instead, more limited monitoring is proposed, as follows. *'Because the Order Scheme is now being implemented as a single construction project, only one noise monitoring programme is **required**. This will consist of two monitoring rounds at approximately 6 months and 18 months after the opening of the railway for passenger services.'* (Our emphasis).

In our view this statement is incorrect. Our understanding is that what is *'required'* by Condition 19 of the TWA Order is implementation of the NVMP, with its *two* programmes of noise monitoring, involving two rounds of measurement each: one programme close to the start of passenger services, and one programme after full implementation of EWR. The need for the latter arises because of the inevitable uncertainty in the noise predictions – see (3) above.

The NVMP proposes noise monitoring solely to check the correct functioning of the mitigation measures: noise barrier and the noise insulation. Conceivably, if this were the only purpose, a single two-round monitoring programme as proposed in the NSoA would suffice. But the presence of uncertainty in the noise predictions adds another important motivation: to check actual noise levels at properties that were denied noise insulation on the basis of the noise predictions, but only by a modest margin that could have been less than the error in the predictions. Fairness to the occupiers of these properties requires that noise monitoring there is carried out *after* the full range of EWR passenger and freight trains have been introduced and, if the measured noise differs from predictions and meets the criteria, they should be offered statutory or non-statutory noise insulation as appropriate.

7. Modifications to EWR that *could* satisfy Condition 19 with respect to noise

It is clear from above that the NSoA fails to demonstrate compliance of EWR in its current form with Condition 19, with respect to noise. It fails to honour some commitments made in the NVMP, crucial to the protection of residents from excessive train noise. Therefore some modifications to the EWR scheme will be needed before Condition 19 can justifiably be discharged. Fortunately, there are several potential remedies available.

(i) Introduce a reduced speed limit

Reduced train speed limits were deemed as unnecessary by the Public Inquiry Inspector and the Secretary of State on making the TWA Order, on the basis of the evidence before them. However, they did not indicate that reduced speed limits were impossible. It is clear from above that in some critical respects the evidence was misleading. The ES and NVMP misled the Inspector and the Secretary of State in claiming a degree of willingness and ability on the part of the railway companies to mitigate the high levels of noise and vibration arising from EWR, that the VSoA and NSoA have since revealed to be false.

In this situation, a significantly reduced speed limit would be a most effective, and justifiable, alternative means of mitigating noise at source, and bringing down noise levels at buildings and in open ground. We recommend that 30mph would be suitable. It would bring down noise levels by approximately 7dB, and would probably also solve the outstanding problem of excessive EWR vibration in Wolvercote.

(ii) Apply tuned rail dampers to the tracks

Another effective means of reducing track-sourced noise from railways appears to be the use of tuned rail dampers, an example of the at-source noise mitigation promised serious consideration in the NVMP but then refused in the NSoA. The Tata Steel SilentTrack product takes the form of rubber/metal blocks that clamp to the side of the rail and absorb energy of vibration of the rail. The manufacturers claim this reduces track-sourced noise by 3 – 7dB. If these were fitted to the rails along the whole of Section H, they would make a major contribution to mitigating the noise problem. For example, an attenuation of even 3dB would reduce by 50% the land exposed to a given noise level, on either side of the track, at any point along it. We ask that such rail dampers be employed throughout Section H⁷.

⁷ As we prepare this document (18 April, 2015), we have learned of a very recent development: a proposal in writing from NR, to employ SilentTrack just in Wolvercote cutting, on an experimental basis. However, at present it is unclear whether this will be a permanent solution, and it will leave other parts of Section H without such protection.

(iii) *Remove the Bladon Close set of points*

At houses near this set of points, noise levels will be even higher than without the points: the ES suggests 3dB higher. This is doubly unacceptable since (a) it applies to properties where noise levels are predicted to be already exceptionally high ($L_{A,max}$ up to 88dB); and (b) there is an explicit commitment in the NVMP to design the scheme such as to attempt to avoid locating points close to noise sensitive receptors such as domestic houses. We ask that the track layout be modified, to remove the set of points to a location as far as possible from houses and the school. This solution would have the added benefit that it would resolve the outstanding problem of the predicted vibration exceedances at Bladon Close.

(iv) *Restore the second noise monitoring programme*

As explained above, the removal of the second noise monitoring programme proposed in the NVMP creates a problem because of the unavoidable uncertainty in predicted noise levels. The second noise monitoring programme, to be carried out after full implementation of EWR and introduction of all the new trains, would have played a vital role. It would have provided a suitable means to check the actual noise levels resulting from all the new trains, instead of relying only on predictions. We ask that this second noise monitoring programme be reinstated into the plans for EWR.

8. Conclusions

Upper Wolvercote and Lakeside appear to be exceptionally vulnerable to high levels of train noise caused by introduction of the EWR scheme, if it goes ahead as currently proposed. The effects will be worse than intended by the Secretary of State when awarding the TWA Order, since the NSoA has revealed that Condition 19 will not be satisfied. Clearly some modifications to the scheme are needed before Condition 19 can be discharged. We hope our suggestions above will be helpful to the Council.

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