Comments on the Applicant's Responses to the Examining Authority's Written Questions.

Deadline for receipt of Comments to Responses: Friday 9th February 2024

Unique Reference Number: 20040614

Introduction

On the 10th October 2023, I submitted my "Written Representation to the Examining Authority regarding the Environmental Statement submitted by Tritax Symmetry (Hinckley) Ltd in respect of their proposed Hinckley National Rail Freight Interchange and with particular reference to Chapter 10: Noise and vibration."

My Written Representation was a technically-based document that identified and discussed several serious failures and shortcomings in Tritax's Noise and vibration report. It ran to 38 pages and comprised twelve main Sections.

The Responses that Tritax Symmetry (Hinckley) Ltd made to those Interested Parties who had registered as individuals were contained in their Document Reference: 18.3 "Applicant's Comments on Written Representations [Part 4 of 4 Residents Businesses]" [REP2-066] of the 24th October 2023, this being amongst Tritax's Deadline 2 Submissions.

Tritax's Responses Document made no response at all to eight of my twelve Sections. For the other Sections, Tritax's four responses did not engage with what I had written, but simply quoted from Tritax's earlier Noise and vibration report and were very short at typically 6 lines long.

Accordingly, on the 14th November 2023 I submitted my "Comments on the Responses by Tritax Symmetry (Hinckley) Ltd to my Written Representation to the Examining Authority (ExA)" document.

This shorter document summarised the twelve Sections of my Written Representation, and for each Section indicated what Response, if any, I had received from Tritax.

Subsequently, on the 9th January 2024 Tritax submitted their Document Reference: 18.13 "Applicant's response to deadline 3 submissions [Part 9 -Noise]", this being amongst Tritax's Deadline 4 Submissions. This document contained Tritax's response, not to my Written Representation of the 10th October 2023, but instead to my Comments Document of the 14th November 2023.

But my Comments Document had been written for the purpose of complaining that Tritax had not responded to my earlier Written Representation document. It was not the Written Representation document itself. So as matters now stand, Tritax have still not made a meaningful response to my Written Representation of the 10th October 2023.

Further, in their Applicant's response document of the 9th January 2024, Tritax wrote:
"The applicant disagrees strongly with the suggestion that there has been no engagement with some elements of Dr David Moore's previous representations.
On fully reviewing the information provided, the applicant distilled down what were considered to

be the 12 main points that were being raised, given the length of the submission. Each of these was addressed in the applicant's Deadline 2 submission."

The description of events Tritax have given above is wrong. Tritax's behaviour has caused omission, delay and confusion in the Examination Process. And I am writing this now to set the record straight.

The remainder of this document Comments upon the Responses by the Applicant to the Examining Authority's Written Questions, ExQ1.8.2 to ExQ1.8.24. All of these Written Questions were originally directed to the Applicant, the sole exception being ExQ1.8.18, which was originally directed to me, but to which the Applicant made a Verbal Response during the Issue Specific Hearing (ISH6) on Traffic and Transport, and Noise.

For reasons of brevity, I have in this Comments Document used "Tritax" to refer to the Applicant's Environmental Statement, the Applicant's Responses and the Applicant's Verbal Statements.

Finally, I have grouped my Comments into the same Agenda Headings that were used by the Examining Authority in the Issue Specific Hearing (ISH6) on the 24th January 2024. I hope this arrangement makes matters compact and understandable.

Dr David Moore

MA (Cantab) PhD

David Moore is a Chartered Engineer, and a Fellow of the Institution of Mechanical Engineers. He has some 25 years experience in Industrial Design Consultancy. Clients have included 3M, Procter & Gamble, GSK, London Underground, Johnson & Johnson, Ricardo, Monsanto, DePuy, AstraZeneca, BAE Systems, Unilever, Reckitt, Sanofi and Alstom. Now retired, his technical interests include Mechanical Design, Mathematical Modelling, Computational Fluid Dynamics and Digital Signal Processing.

Baseline Noise Conditions

1.8.2. Ambient Noise Levels

"A) Following discussions at ISH3, can the Applicant provide written clarification as to why noise collected at NMPs has not been attenuated for both distance and topography in order to decipher current ambient noise levels at NSRs and why assessments do not need to altered to account for this."

Tritax have not responded to the Examining Authority's Question 1.8.2 about the noise collected at NMPs. Instead they have replied very obliquely by reference to an Update Note, Document Reference 18.7.6 "Written Statement of Oral Case ISH3 (Appendix F – Noise Assessment Update Note), reading from the bottom of their page 6 onwards.

In their Update Note, Tritax seek to introduce two sets of data, the first being Rail Noise data, and the second Road Noise data. Tritax then go on to combine the two logarithmically to arrive at new Noise Data overall. I consider each of these in turn below.

Rail Noise Data

Rail Noise is routinely characterised as a Line Source of Noise because, unless conditions (such as speed or gradient) vary significantly along the length of the rail line, then the trackside Rail Noise is uniform along that stretch of line. This is very well understood in the Rail Industry , and is one of the central tenets of "Calculation of Rail Noise" (CRN).

There are no such variations in the length of line we are discussing here. Therefore the Rail Noise along that length of line is uniform.

In their Noise and vibration report proper, Tritax measured Rail Noise at Noise Monitoring Position NMP4 at the trackside over a continuous period of some seven days. As such, that measured data may be viewed as the "Gold Standard" and together with the data from the other NMPs forms a foundation of Tritax's report.

Given the obvious nature of the above, it is very difficult to understand why Tritax did not simply use the very detailed Rail Noise data they had already gathered at NMP4 to describe the Rail Noise over the short distance along the track that they discussed in their Update Note.

The Rail Noise data that Tritax seek to introduce in their Update Note is however ***very much higher*** than the NMP4 data Tritax measured in their Noise and vibration report.

The Rail Noise data at Tritax seek to introduce in their Update Note is in fact an extract taken from a national plot from a website provided by a company called Extrium that indicates DEFRA (Department of the Environment for Food and Rural Affairs) data. It is intended as a general guide to noise in the vicinity of railways.

I show below two Figures taken from Tritax's Update Note. Figure 1 shows their DEFRA Rail Noise Data during daytimes, and Figure 2 during night-times.

Figure 1: Daytime noise levels from rail traffic, dB $L_{Aeq,16h}$

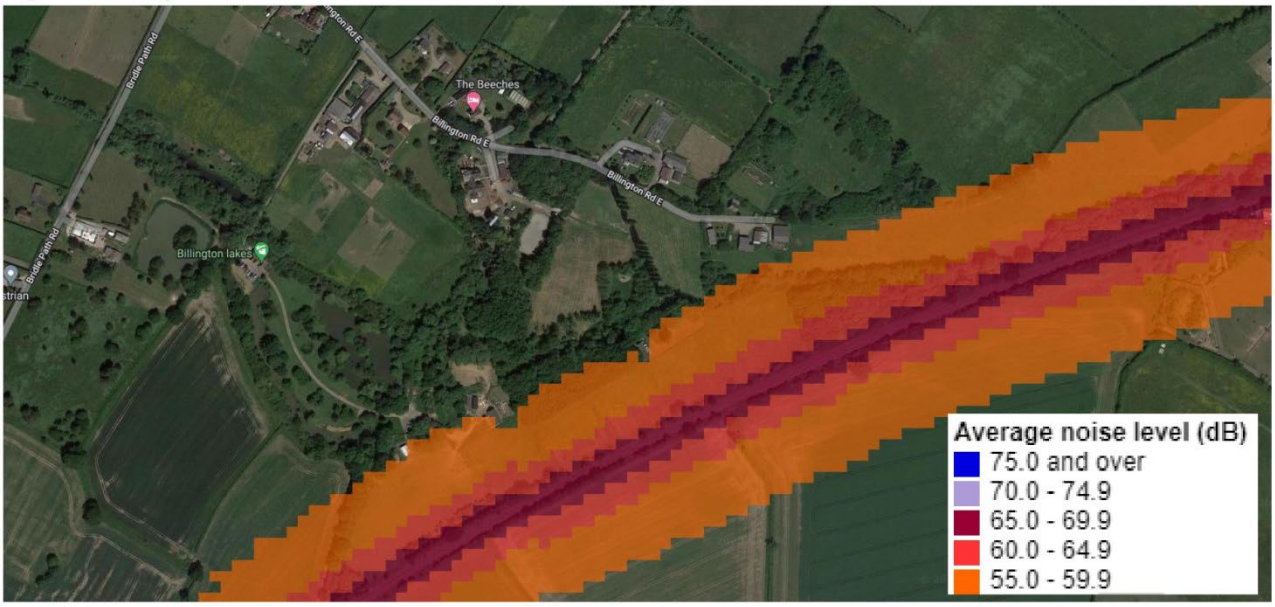
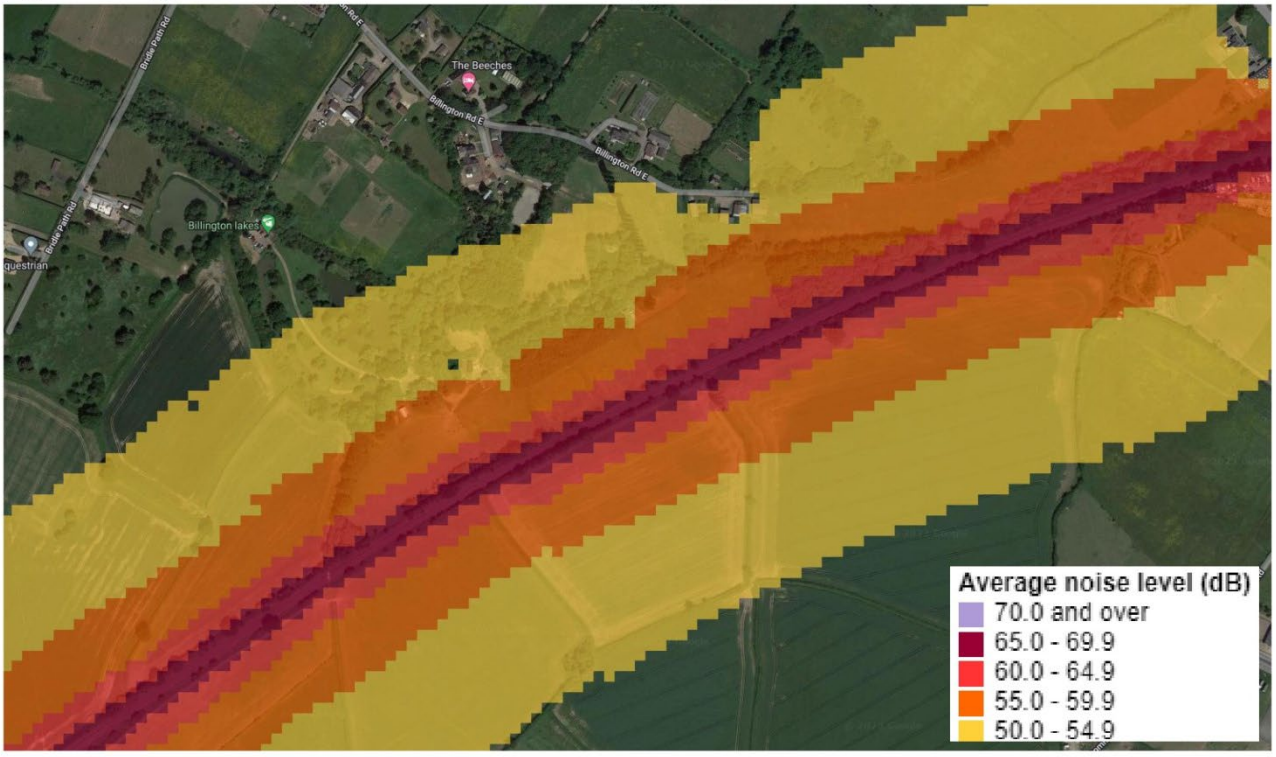


Figure 2: Night-time noise levels from rail traffic, dB L_{night}



(In these two Figures you can clearly see the noise corridor, with its characteristic “bands” which are caused by the Attenuation with Distance from the railway that occurs as you move away from the rail line. As you move further from the rail line, you can see that the **rate** of this Attenuation with Distance progressively reduces such that each successive outward “band” is typically twice the width of the previous inner one.)

Now, this provides a very descriptive picture of the Attenuation Process that naturally occurs. But you begin to see warning signs when you compare the daytime noise contour "bands" shown in Figure 1 with those shown for the night-time in Figure 2. Although you would expect to see a considerable narrowing during the quieter night-time period, you can actually see no obvious change between the two. (For context here, NMP4 indicates a night-time noise reduction of 3dB compared with daytime, so we would expect to see the width of each of the bands (and therefore also the overall width of the noise corridor) to reduce by a factor of 2.)

Although I cannot actually show this level of detail here, I have gone onto the Extrium website and compared online the widths of the noise corridors (as bounded by the **orange** bands) in Figures 1 and 2 during daytime and night-time respectively. The night-time width is actually some 8% **greater**, and so indicates a **noise increase** at night-time. So we are clearly dealing with broad-brush data here.

But it's when you actually come to look at the dB values in the Table Keys that the alarm bells really start to ring. For example, in Figure 2, the boundary between the orange and the yellow bands is indicated at 55.0dB. But this is almost the same night-time Noise level of 56.3dB that was measured at NMP4 at a location just 12 metres from the track!

Further analysis indicates that in comparison with the precise "Gold Standard" Noise measurements performed at NMP4 over a period of seven days, the data in Figures 1 and 2 overstates the Train Noise levels by approximately 12dB during the daytime, and rather more at night-time. So the values in the dB Keys in Tritax's Figures 1 and 2 need to be adjusted downwards by 12dB accordingly.

Or, for a visual indication, this means that the width of each of the bands (and therefore the overall width of the noise corridors) shown in Tritax's Figures 1 and 2 should be reduced by a factor of twelve. This, I believe, contracts the whole of the noise corridor banding shown in Figure 1 down to a narrow ribbon that is fully contained within the boundary of the railway property.

A yet further failing of the DEFRA Rail Data that Tritax seek to introduce in their Update Note is that it provides no information in respect of the much quieter periods of the weekends, and especially the weekend night-times, when very few, if any, trains run, and when the contours Tritax have shown will simply disappear because there is no Rail Noise at all.

Now, in their Noise and vibration report proper, Tritax referred in their Paragraph 10.252 and their Footnote 41 to the Extrium website and to the Strategic DEFRA mapping, and stated "the DEFRA mapping is produced at a strategic level and therefore not accurate enough to design against". But Tritax have obviously not thought fit to repeat that warning when they seek to actually introduce this data in their Update Note. And were Tritax aware of this discrepancy when they wrote their Update Note?

Whatever the answer to that question might be I think that, at root, the problem lies in trying to use general guidance data for a purpose for which it was never intended.

Finally, in order to underline the point I made earlier concerning the **uniformity** of the Rail Noise over the length of line we are discussing here, I show below an extract from the Extrium website that displays the daytime DEFRA Rail Noise data over the length of line, extended to include NMP4. The **uniformity** of the Rail Noise over that whole stretch of line is clearly evident.

What all this means in practical terms is that, in Tritax's Update Note, Table 4, the values shown in the second column headed "Indicative Rail Traffic dB LAeq,T" are all invalid.

I have already demonstrated in my Comments Document of the 14th November 2023, and also in my Response to the Examining Authority's Written Questions of the 9th January 2024, that the Attenuation of Rail Noise can be appropriately modelled in accordance with BS4142 and the "Calculation of Railway Noise" (CRN) using the Noise Monitoring NMP4 results that Tritax have already disclosed in their Noise and vibration report proper and their ES Appendix 10.10 "Summary Results". My Response to the Examining Authority's Written Questions also outlines cross-checks that provide strong confirmation of both the NMP4 data itself, and the accuracy of the CRN modelling.

Road Noise Data

Although its provenance seems unclear, it is my understanding that the Road Noise data that Tritax have used in their Update Note has, like their Rail Data, ultimately been sourced from DEFRA. But whereas their Rail Noise data was taken directly from the Extrium website in the ready form of Noise Contour maps, for the Road Noise Tritax have instead sourced the data in the form of Traffic Flows. To use this data, Tritax have then themselves created a Noise Model, from which in turn Tritax have then predicted the Noise Contour maps shown in Figures 3 and 4 of their Update Note.

The first thing to understand here is that because we are now considering Road Noise alone, there is no component of Rail Noise included. So the railway is therefore considered to be silent.

Now, throughout their 7-day recording periods, NMP3 and NMP4 both acquired the Noise Data indicated in Tritax's ES Appendix 10.10 "Summary Results" in graphical form, the dB values of which are shown at 15-minute intervals. For each of these NMPs, this includes intervals during which there were Train Pass Bys, and also intervals when there were no Train Pass Bys. In accordance with BS4142, this data can be therefore be used to indicate the ***Road Noise*** levels prevailing in those intervals where no Train Pass-Bys occurred, these Road Noise levels being respectively in the range of 39dB to 41dB for NMP3, and 41dB to 44dB for NMP4 during the Weekday daytime periods.

When we consider the roads that principally contribute to the Road Noise at NMP4 and the surrounding region, we find there's the M69 at 1.21 kilometres away, and the (obviously much smaller) B4668 at 1.06 kilometres away.

Now, because the M69 is so far away, this means that if we are standing at NMP4 and take a 1-metre stride ***in the direction away*** from the M69, we find that this makes only about $1/100^{th}$ of a dB reduction to the noise contribution received from the M69. And for the B4668, which is almost as far away from NMP4 as the M69, the corresponding change is only $1/80^{th}$ of a dB. And because the M69 and the B4668 lie in opposite directions, one of these is a reduction, and the other is an increase, so the two tend to cancel each other out, rather than add together.

And, in the same way that we have observed for Rail Noise (which, like Road Noise, is a Line Source of Noise), we find that moving in a direction parallel to these two roads does not in itself affect the noise contribution received from either of them.

As a result of these two effects, we find that both NMP3 and NMP4 lie within a very "flat" ***Road Noise*** profile, in which movements in all directions (both North-to-South, and East-to-West) have little effect on the local Ambient Road Noise value.

A very similar situation also prevails for the region which Tritax have shown in their Figures 3 and 4, which lies a little way to the North-East of NMP4 and which show Tritax's predicted Road Noise levels for the Weekday daytime and Weekday night-time respectively. The dB contour bands shown in Figures 3 and 4 are very tight at only 2 dB, and what we are actually seeing here is again a very "flat" Road Noise profile in all directions, very similar to the "flat" profiles described at NMP3 and NMP4, and again for the similar reason that the roads are so far away.

To make matters clearer here, I have prepared a mapping which shows NMP3, NMP4, and Tritax's Figure 3 all in the same Figure. This is shown below.

With reference to the Figure, we can see that the Road Noise levels at NMP3 and NMP4 are very similar to each other, differing by only 2dB or 3dB despite their distance apart. This is exactly as would be expected in view of their very considerable distance from both the M69 and the B4668, and the very "flat" noise profile this would bring about. And of course, Figure 3 also displays the same type of very "flat" noise profile, again owing to its distance from the M69 and the B4668.

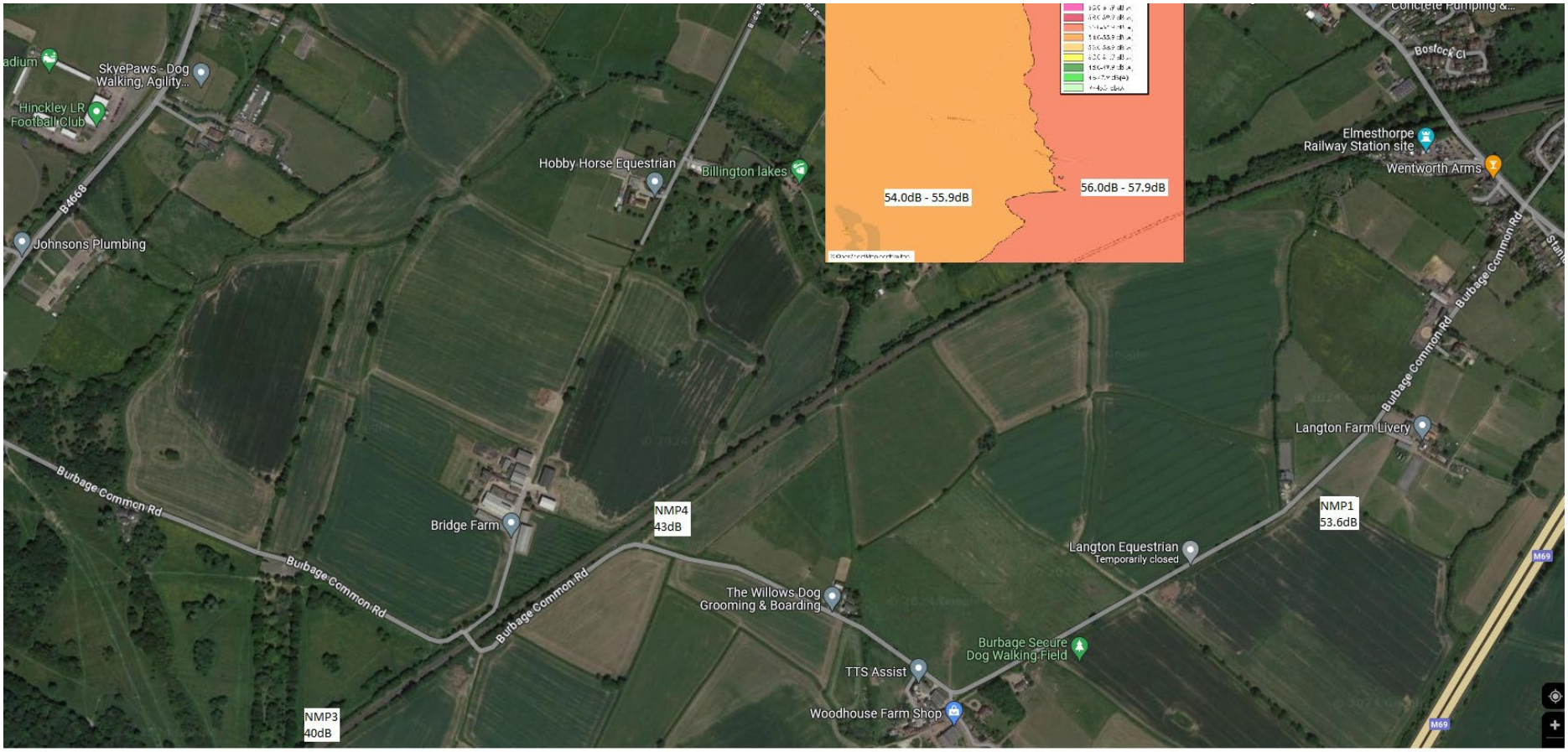
But the big surprise comes when we compare the measured Ambient Road Noise levels at NMP3 and NMP4 with Tritax's predicted Road Noise levels in Figure 3. Here we find that there is a major disjoint of 12dB between the measured Road Noise value at NMP4 (at between 41dB and 44dB) and Tritax's predicted Road Noise values (at between 54dB and 55.9dB). And, even more surprising is that this occurs over a very moderate distance and in the very "flat" noise environment determined by the M69 and the B4668 that are both over a kilometre away!

In addition to the Rail Noise Monitoring that Tritax performed at NMP4 and NMP3 and referred to above, Tritax also performed Road Noise Monitoring at NMP1, again over a 7-day recording period. These measurements are also relevant to this discussion, and I have accordingly included NMP1 in my Figure. (The value of 53.6dB shown is taken from Table 10.43 of Tritax's Noise and vibration report, which indicates the Weekday daytime Noise levels for those NSRs associated with NMP1.)

In the case of NMP1, the Ambient Noise level of 53.6dB ***includes*** the Train Pass Bys (there being no way of removing the Rail Noise from the data made available by Tritax). And of course it also ***includes*** the local roadside noise on Burbage Common Road. So the Ambient Noise level of 53.6dB indicated at NMP1 in my Figure will be ***rather higher than the Actual Road Noise in the surrounding area***.

With reference to the Figure, you may see that the measured Noise Level at NMP1, which is rather higher than the Actual Road Noise in the surrounding area, is in fact 3.4dB ***lower*** than Tritax's predicted Road Noise (of between 56dB and 57.9dB) shown in their Figure 3, ***despite the fact that NMP1 is only a third of the distance away from the dominating M69!***

In view of the all of the above, Tritax's predicted Ambient Noise Levels indicated in their Figures 3 and 4 require further investigation. When compared with the "Gold Standard" noise measurements at NMP3, NMP4, and NMP1, and taking into consideration the flat local noise profile, they appear inexplicable.


54.0dB - 55.9dB
56.0dB - 57.9dB
SkyePaws - Dog Walking, Agility...
Hinckley LR Football Club
B4668
Johnsons Plumbing
Hobby Horse Equestrian
Billington lakes
Bostock Cl
Elmesthorpe Railway Station site
Wentworth Arms
Burbage Common Rd
Langton Farm Livery
Bridge Farm
NMP4
43dB
NMP1
53.6dB
Langton Equestrian
Temporarily closed
The Willows Dog Grooming & Boarding
Burbage Secure Dog Walking Field
TTS Assist
Woodhouse Farm Shop
NMP3
40dB
M69

Update Note contradicts Noise and vibration report

Finally with regard to the Examining Authority's Question 1.8.2 to the Applicant, there is a yet further issue with regard to Tritax's Update Note, Document Reference 18.7.6 "Written Statement of Oral Case ISH3 (Appendix F – Noise Assessment Update Note) which I also need to cover here.

In their Noise and vibration report, Paragraphs 10.173 to 10.175, Tritax use the low Noise Levels measured at NMP4 to try to justify their move away from the (almost universally used) Background Noise levels measured at NMP4 and use instead the Ambient Noise levels measured at NMP4. And they then apply the Ambient Noise levels measured directly at the trackside at NMP4 to all of the NSRs that are associated with NMP4 on the basis that NMP4 is "representative" of all of those NSRs, a term that Tritax interpret very selectively to their own advantage. In doing so, Tritax gain an advantage of 20dB (plus another 5 or 10dB for Rating Penalties) that they maintain throughout the remainder of their Noise and vibration report. I have described this several times previously.

What we see in their Update Note is that Tritax are now trying to show that the Ambient Noise level at NMP4, far from being "representative" of the NSRs, is in fact much lower than the Ambient Noise levels at those NSRs. But, at the same time, Tritax are still trying to maintain that the (Gold Standard) NMP4 is still "representative" of the NSRs for the purposes of their Paragraphs 10.173 to 10.175, in order to allow Tritax to maintain the advantage of 20dB (plus another 5 or 10dB for Rating Penalties) that they argued for in their Noise and vibration report!

Tritax appear to be engaged in some very convoluted practices here, and offer nothing in the way of explanation, justification or objectivity. But it's all decidedly to their own advantage.

1.8.3. Noise Attenuation

"If attenuation identified at ExQ1.8.2 needs to be applied for the specific sound recorded at the NMPs to establish sound experienced at NSRs, are the documents "Calculation of Railway Noise", published by the Department of Transport in 1995, and the "Calculation of Road Traffic Noise", published by the Department of Transport, Welsh Office, in 1988 relevant to perform this? If so, how would these affect assessments?"

Tritax have avoided answering this question, citing their Document Reference 18.7.6 "Written Statement of Oral Case ISH3 (Appendix F – Noise Assessment Update Note), the contents of which I have heavily disputed above.

It is worth noting that in their Noise and vibration report, Paragraph 10.84, under the heading of "Other Relevant Policy, Standards and Guidance", Tritax have listed both the "Calculation of Railway Noise" and the "Calculation of Road Traffic Noise" documents.

Tritax have also made some use of CRN in their calculation of Noise from Off-Site Rail Movements in their Paragraphs 10.206 to 10.212. And in Paragraph 10.210 they state "As CRN does not include current rail stock, reference has also been made to the additional guidance published by DEFRA 'Additional railway noise source terms for Calculation of Railway Noise 1995.'

1.8.18 Tabular Comparison for Noise Effects

"It is stated that there are a number of deficiencies in the applicant's methodology for noise assessments and corrections to dB levels are suggested accordingly. Could Dr David Moore and Mr William Moore provide a tabular comparison of the overall effects in terms of noise at NSRs between the Applicant's stated levels of effect and those predicated using suggested revised methodologies?

As you may see from the above, the Examining Authority directed this Question 1.8.18 to me. I responded to the Examining Authority's Question in my "Response to the Examining Authority's Written Questions and Request for Information ExQ1 Question 1.8.18 regarding the Applicant's methodology for noise assessment in the proposed Hinckley National Rail Freight Interchange" of Tuesday the 9th January 2024.

In the Issue Specific Hearing (ISH6) on Traffic and Transport, and Noise on Wednesday the 24th January 2024, the Examining Authority asked Tritax:

"Doctor Moore has produced a Table in response to our Written Questions for noise levels at NSRs in the absence of train movements. That is Table 1a in Document REP4-195.
It is stated that this constitutes 96% of the total time. It is therefore stated that these are the noise levels presently ruling at the NSRs for 96% of the time, and it is against these levels that noise from the proposed development should be judged. Can I have the applicant's thoughts on that please?"

Tritax's response to the Examiner's Question was as follows:

"Yes, it's again, go back to the to the point of how noise is measured. And it's measured as an equivalent noise level over a set period of time. You know, if we were working on a basis that there were no train Pass Bys 96% of the time, that would have been picked up in the noise survey, and that would be reported in the levels. As it is, it hasn't. And it's to do with how noise is measured and how it's reported."

British Standard BS 4142:2014+A1:2019 "Methods for rating and assessing industrial and commercial sound" describes in detail the measurement of Background Noise and its comparison with the Specific Sound generated by the Proposed Development to which appropriate Rating Penalties have been applied.

BS 4142:2014+A1:2019 neither describes nor indeed even mentions any possibility that Background Noise could be replaced nor even supplemented by any other parameter.

BS 4142:2014+A1:2019 defines Background Noise $L_{A90,T}$ as the:

"A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting, F, and quoted to the nearest whole number of decibels."

Tritax have taken the time interval T to be 1 hour during daytime, and 15 minutes during night-times.

What this actually means in respect to the NMP3 and NMP4 at the side of the rail track is that in the measurement of the Background Noise level all of the Train Pass Bys would be immediately excluded (as they are noisy), and the Background Level would be taken from the lowest 10% of the time, ***during which there would of course be no Train Pass Bys.***

Background Noise is the parameter against which Proposed Development Noise is compared because it correctly represents the way that such Proposed Development Noise is judged against the Baseline Conditions by Residents and others at the NSRs. And this is why BS 4142:2014+A1:2019 always refers to Background Noise in this way.

In my Written Response to the Examiner's Question 1.8.18, I highlighted that Residents and others would judge the Proposed Development Noise against the Baseline Conditions prevailing for 96% of the time (that being, when no trains are present) because it is so easy, faced with that situation, to understand what their reaction would be, and what the ramifications would be should the Proposed Development be built.

And in fact, you will see from the foregoing that the Background Noise level goes much further than excluding only the 4% of the time when Train Pass Bys are occurring. The Background Noise not only excludes all the of the Train Pass-Bys but also the other highest 86%, so reducing the dB level even further below those I indicated in my Table 1a.

And of course, Tritax measured the Background Noise levels at all of the NMPs over a sustained period, but then have tried to move away from Background Noise levels in order to secure a huge advantage for themselves in their Noise and vibration report. I have described this already several times.

With all of this as a backdrop, it was both disingenuous and misleading for Tritax to have replied as they did to the Examining Authority's Question. They know all about Background Noise, how it is measured, and why it is used.

Construction Noise

1.8.4. Construction Noise

"Likely noise effects at NSRs have been considered on an 'average case' and a 'worst case' scenario. For the 'average case' an 'approximate centre point of the closest area of construction' has been used.

A) Can the Applicant explain how this centre point was established for the purposes of assessments?

B) Further, can it identify the size of the closest area of construction and its distance from site boundaries, including the reasons for such measurements, noting that Interested Parties ([REP1-109] to [REP1-113]) consider average calculations to be correct only when plant is grouped at 300m from the site boundary and that the average area of construction is around 600m in width? If this is correct, what are the implications for noise assessments?"

In their reply, Tritax have not answered the Examining Authority's questions regarding the dimensions and grouping they have used in their "average case" scenario. This means that the width of their "closest area of construction" in their "average case" scenario is still not known, and so the distance of the point at which Tritax, in their "average case" scenario, have grouped plant and machinery away from the site boundary can still not be calculated.

The Attenuation over Distance from the 90dB in Tritax's "worst case" scenario, which is reduced down to 58dB in their "average case" scenario, indicates that the centre point of the grouped plant and machinery is at 300 metres distant from the site boundary. In Tritax's "average case" scenario, no item of plant or machinery would therefore be allowed closer to the site boundary than 300 metres. This is makes Tritax's "average case" scenario an extremely unrealistic one, and strongly to Tritax's advantage.

In their response to the Examining Authority's Question 1.8.17, in relation to the level of Uncertainty in Tritax's CadnaA Noise Modelling Calculations, Tritax stated:

"The level of uncertainty from the calculation is low. The resultant levels have been derived using acoustic modelling software that uses ***industry recognised standard ISO 9613-2 calculation method***…." (the bold italics are mine)

It is appropriate at this point to quote from that very same Standard ISO-9613-2-1996 "Acoustics – Attenuation of sound during propagation outdoors" - Part 2: General method of calculation, which warns:
"a group of point sources may be described by an equivalent point sound source situated in the middle of the group, in particular if
a)…..
b)…..and
c) the distance d from the single equivalent point source to the receiver exceeds twice the largest dimension H_{max} of the *sources* ($d > 2H_{max}$).
If the distance d is smaller ($d \leq 2H_{max}$), or if the propagation conditions for the component point sources are different (e.g. due to screening), the total sound source shall be divided into its component point sources."

In our case, assuming the size of their "closest area of construction" (which Tritax have still not given) is 600 metres square, then the diagonal H_{max} is approximately 850 metres. This means that d, the distance of the NSR from the centre of the site, must be in excess of 1.7 kilometres for Tritax's "average case" calculation to be applicable! For all the NSRs that are considered here, d is of course in all cases very much less than 1.7 kilometres, and so the items of plant need to be considered individually.

Therefore Tritax's "average case" scenario is both unrealistic and invalid.

The diagram that Tritax provided in their response is unclear.

1.8.5. Construction Noise Modelling
1.8.6. Construction Noise Modelling – Plant Machinery
1.8.7. Construction Noise Modelling
1.8.8. Construction/Operational Activity
1.8.9. Cumulative Effects
1.8.10. Predicted Unmitigated Noise Assessments

I will comment collectively upon the six individual Questions above that the Examining Authority have put to Tritax, because in each case Tritax have in essence replied that their Noise and vibration report is in compliance with BS5228-1. And indeed they have indicated that their activities are constrained by and limited to the contents of BS5228-1.

In its opening pages, BS 5228-1 "Code of Practice for Noise and Vibration Control on Construction and Open Sites" states that it "gives ***recommendations for basic methods*** of noise control relating to construction sites". (the bold italics are mine)

Overall, it aims to provide a simple and accessible guide to the noise levels that will prevail around construction and open sites, which are often small and fast-changing, so that elaborate calculations are inappropriate.

For example, the guidance that it provides for the attenuation of sound as it propagates over distance is very basic, and amounts to no more than a single chart with two lines corresponding to the two extremes of "hard ground" and "soft ground" conditions respectively. And it includes no guidance on the adjustment or rating of noise levels for acoustic character.

The Proposed Development is however extremely extensive, and the resulting Construction Noise will extend for very many years, perhaps beyond the span of many local residents.

Notwithstanding all of the above, Tritax's responses to the Examining Authority's Questions 1.8.5 to 1.8.10 displays an attitude of disengaged indifference based upon the argument that that they cannot and indeed are not permitted to extend beyond the guidelines of BS 5228-1.

Acoustic Absorption

1.8.11. Ground Acoustic Absorption

In terms of noise impacts from the completed development, how has the ground absorption coefficient of 0 been calculated as identified in paragraph 10.220 of ES Chapter 10 [APP-119] for the "Do Something" scenarios? Has this coefficient been used for all noise models and, if not, why not?

1.8.12. Ground Acoustic Absorption

A) Could the Applicant explain why a ground absorption coefficient of 0.0 should not be extended beyond the site boundary to include the width of the existing railway?

B) If it were to be extended, what effect would this have on the assessments?

The CadnaA Acoustic Software that Tritax have employed in their Noise and vibration report evidently has the ability to model a wide variety of industrial, residential, recreational, agricultural and mixed environments. As such, it must surely allow individual areas of ground each to be allocated their own values for the Ground Acoustic Absorption, be it G=0.0 or G=1.0 or even…. somewhere in between.

Accurate and representative Acoustic Modelling in the critical area encompassing the Outward-Facing Units 7, 8 and 9, the Acoustic Barriers, Gantry Cranes, Reach Stackers, and the Rail and Road Vehicles, the interplay between them, and how the resultant Noise is projected forwards towards the affected NSRs must surely be a prime requirement of the Noise and vibration study.

And the correct Ground Acoustic Absorption of G=0.0 should be used in this critical and potentially Resonant area.

During the course of the Issue Specific Hearing (ISH6) on the 24th January 2024, Tritax stated:

"The Industry Standard approach, when you've got mixed ground, which we have in this situation, is to use an absorption coefficient of 0.5"

I refer now to Tritax's ES Appendix 10.7 "Proof of Evidence of Simon Stephenson on Noise", Document Reference 6.2.10.7, prepared by RPS Consulting Services, which states:

"8.6 The noise emissions due to the proposed development have been modelled using the CadnaA environmental noise prediction software. This model calculates the contribution from each noise source input as a specified source type (e.g. point, line, area) octave band sound power levels at selected locations. It predicts noise levels under light down-wind conditions based on hemispherical propagation, atmospheric absorption, ground effects, screening and directivity based on the procedure detailed in ISO 9613.

8.7 ***The ground between the site and the receiver locations has been assumed to be soft although the site has been assumed to be hard.*** Terrain contour data has also been entered in the model based on OS land contours. The site buildings have been included and these provide some degree of screening as well as reflecting surfaces." (the bold italics are mine)

This gives the lie to Tritax's comments regarding an "Industry Standard".

A further reason for using the ***correct*** Ground Absorption coefficients in the ***correct*** places is that, if this is not done, then, as the noise propagates from the Site to the individual NSRs it will be Attenuated for Distance at the wrong rate. The CadnaA predicted noise levels will therefore be too low at those NSRs closer to the Site, and too high at those NSRs further away from the Site. Or vice versa.

The CadnaA software should be given the correct values to work with. Assuming "eyeballed" averaged values can only foster increased Uncertainty in the Noise Predictions obtained from CadnaA.

Noise Sources from the Proposed Development

1.8.13 Background and Rating Levels

Does the BS4142:2014+A1:2019 "Technical Note" published by the Association of Noise Consultants Good Practice Working Group in March 2020 have any relevance to assessments in terms of background levels and rating levels? If so, could the Applicant explain the implications?"

The Association of Noise Consultants (ANC) is the representative body for acoustics consultancies and currently has 110 member companies employing over one thousand consultants.

Membership is open to all acoustics consultancy practices able to demonstrate the necessary professional and technical competence. BWB Consulting Limited are not listed as Members.

All of the Authors of the Association of Noise Consultants BS4142:2014+A1:2019 "Technical Note" are pre-eminent in the field of Acoustics Consultancy and are variously Fellows or Members of the Institute of Acoustics.

In their Introduction to the BS4142:2014+A1:2019 "Technical Note" the Authors wrote:

"In the production of this guidance, the ANC Working Group (WG) has reviewed BS 4142 and attempted to address any content regarded as ambiguous. There are some instances where the WG has chosen to go beyond strict interpretation of BS 4142 and to offer additional ancillary advice. Wherever possible a group position has been presented. In some cases, where the WG has held a range of views, it has tried to make this clear.

The WG has tried to illustrate the guide with real life examples, some of which were provided by working group members and some of which were helpfully provided by other ANC members. In certain sensitive cases, where the group felt it necessary to alter the reported facts, it has tried to do so without changing the principles on which the assessment decisions and outcomes were based.

The discussion within the document is also intended to assist with the evolution and development of BS 4142."

Baseline and Off-Site Rail Movements

1.8.14. Rail Movements

"Data on timetabled trains has been used to provide the baseline for the existing movements at the current time on a weekday. Could the Applicant explain how this element of modelling is robust given that some trains timetabled to run do not actually run?"

Tritax stated:
"There would need to be a significant reduction in trains running for this to have an appreciable effect on the existing ambient noise levels in proximity to the railway."

Yes, I agree! And ***there is*** a very significant reduction in the number of trains running! A reduction of over 40 Freight Trains per day! As indicated below:

Weekdays (24 hours) - of the 62 Freight Trains indicated by Tritax, only 21 actually run.
Weekdays (daytime) - of the 41 Freight Trains indicated by Tritax, only 14 actually run.
Weekdays (night-time) - of the 21 Freight Trains indicated by Tritax, only 7 actually run.

The reduction is even more marked at Weekends, and especially Weekend night-times, with no trains running at all on Saturday nights.

And it is the Freight Trains that are by far and away the greatest contributors to rail noise, by a factor of 11 to 1 per train.

Small wonder then that Tritax's modelling is inaccurate!

Uncertainty

1.8.17. Uncertainty

"Could the Applicant explain how it has addressed the principles of Uncertainty alluded to in BS4142:2014+A1:2019 "Methods for rating and assessing industrial and commercial sound" for the noise and vibration assessments?"

It is evident from Tritax's reply that they have not considered Uncertainty at all. Indeed, their only mention of the word "Uncertainty" in the whole of their Noise and vibration report is in their Paragraph 10.76 which states "there is inherently a degree of uncertainty over the final layout of the site, including where primary noise sources are to be located."

Yet BS4142 devotes the whole of its Chapter 11 to the subject of Uncertainty, emphasising how important it is, especially in the more and more complex developments, and in particular in those instances where the findings might be considered marginal. And these are precisely the categories into which Tritax's Proposed Development falls.

Contrast this with Tritax's fixation upon just two sentences in BS4142, which they have used to try and justify the sweeping and almost unprecedented substitution of Background Noise by Ambient Noise in their Noise and vibration report, a substitution that is not mentioned, much less discussed, in BS4142.

In their response to the Examining Authority's 1.8.17, Tritax assert the level of Uncertainty is low. But it is not, it is very high.

Sources of Uncertainty include:

- The convoluted processes concerning the Baseline Condition.
- The many assumptions made regarding the Construction and Operational activities.
- The number and complexity of the Acoustic Models.
- The practice of considering each Additional Noise Source in isolation.
- The close parity between of Tritax's "Completed Development Noise" and the Baseline Condition Tritax have adopted.
- The practice of expunging the many Additional Noise Sources that Tritax consider insignificant.
- The marginally acceptable Noise Levels Tritax have predicted at Facades, Operational Maximum Noise Levels and WHO Noise Levels for Outdoor Areas.

It's a very tall stack of processes……

- And, finally, but by no means least, Tritax's insistence that, despite all of the contributory factors I have described above, the level of Uncertainty remains low, and is of no concern at all.

Tritax are clearly not going to engage with Uncertainty, any more than they will with Construction Noise.

With regard to ***the level of Uncertainty during measurement***, Tritax state in their reply to the Examining Authority's Question:
"The level of uncertainty of the measurement is low given the length of the measurement period and intervals, and the removal of any adverse weather conditions."

Whilst it is true that Tritax's Noise and vibration report describes in detail the measuring equipment used, the measurement periods, and the weather conditions ruling at the NMPs, it does not indicate the positions at which the NMPs were located away from the trackside (or roadside as appropriate) when the measurements were taken. As these measurements were intended to capture the Specific Sound of the Rail Noise (or Road Noise as appropriate), failing to indicate the positions of the NMPs in this way is in direct contravention of BS4142 which states:

"Measurement locations, ***their distance from the specific sound source***, the topography of the intervening ground and any reflecting surface other than the ground, including a photograph, or a dimensioned sketch with a north marker. A justification for the choice of measurement locations should also be included." (the bold italics are mine).

This means that the Noise Measurements from the NMPs that are used in Tritax's Noise and vibration report are effectively uncalibrated. Although a calibration procedure might be applied with reference to "Calculation of Railway Noise" (CRN) or "Calculation of Road Traffic Noise" (CRTN) as appropriate, Tritax's Noise and vibration report makes no mention of any such procedure.

There is strong evidence that NMP4 was placed too close to the track, and consequently its Noise Measurement are approximately 3.2dB too high. I have written about this several times previously.

As the Noise Data from the NMPs are the basis for Tritax's Baseline Conditions, this constitutes an immediate and significant source of Uncertainty.

With regard to the ***level of Uncertainty during calculation***, Tritax state in their reply to the Examining Authority's Question:
"The level of Uncertainty from the calculation is low. The resultant levels have been derived using acoustic modelling software that uses industry recognised standard ISO 9613-2 calculation method, which assumes downwind sound propagation in all directions. Standardised sound pressure levels were used as input data in the model which is considered to be representative of the sources and the conditions under which the sources are expected to operate."

But Tritax also feel free to ignore at will a warning made in that same ISO 9613-2 Standard, when it does not favour their Proposed Development, as I have indicated earlier in respect of the Examining Authority's Question 1.8.4.

Further with regard to the ***level of uncertainty during calculation***, I quote from the CadnaA website (in slightly Germanic English):
"Calculation of the uncertainty. CadnaA has a large selection of evaluation parameters. Among those, the calculation of the Standard Deviation is required by many guidelines like TA Lärm. CadnaA also includes a statistical analysis tool used to check the effect of any configuration setting that the

user may alter in the calculated results, as required by Quality Assurance Standards such as ISO 17534."

Have Tritax used these Uncertainty tools, and what Standard Deviations did they obtain?

But, overarchingly Uncertainty is about establishing, should the Proposed Development be approved, the risk that the Noise Environment will suffer an unacceptable level of degradation.

This, of course, naturally depends not just upon the "nominal" level of degradation that would be indicated in a balanced and objective Noise and vibration report. But also upon the levels of Uncertainty associated with the Baseline Conditions and with the individual Noise Sources that are created by the Proposed Development.

Tritax's Proposed Development is especially vulnerable in all of these respects.

With respect to Baseline Conditions, it is extremely dependent upon Tritax's extraordinary decision to use Ambient Noise levels rather than Background Noise levels.

With respect to the Additional Noise Sources, too, it is particularly at risk. Firstly, because of the extent and the multi-faceted nature of the Proposed Development, there are many Additional Noise Sources that have been created. Secondly, their treatment in the Noise and vibration report has often been incomplete, confused, or demonstrably wrong., but nevertheless still remains uncorrected. And thirdly, rather than combining the Additional Noise Sources together, they have been considered individually in a piecemeal fashion. As a result, many have been rejected as insignificant, and subsequently entirely lost from Tritax's Noise and vibration report.

But in the real world they will of course not be lost at all, but will simply migrate and come to roost as further factors in the accumulating Uncertainty surrounding the Proposed Development.

Given what has happened to date, the Outcome cannot be now established until the Proposed Development is built.

Rating Penalties

1.8.24. Rating Penalties

"Can the Applicant explain the methodology and rationale for the application of its various rating penalties."

I haven't paid great attention to the Rating Penalties that Tritax have applied in the Noise and vibration report, because by the time you get to that point in their report, the values you are presented with for the Specific Sound level over Background (or, bizarrely in this particular Noise and vibration report, over Ambient) are clearly already unrealistic.

But what I have noticed is that, despite a single reference to the BS4142 "subjective method", which might give the reader a feeling of vague reassurance, Tritax have not actually described any method, if indeed, method there be, as to how they actually have apportioned their Rating Penalties.

They should declare and squarely adopt a quantified procedure, for example the Joint Nordic Method, and be open about its application.

Dr David Moore