

MINUTES OF ORAL EVIDENCE

taken before the

HIGH SPEED RAIL BILL COMMITTEE

on the

HIGH SPEED RAIL (WEST MIDLANDS – CREWE) BILL

Monday 23 April 2018 (Afternoon)

In Committee Room 5

PRESENT:

James Duddridge (Chair)
Sandy Martin
Mrs Sheryll Murray
Bill Wiggin

IN ATTENDANCE:

Timothy Mould QC, Lead Counsel, Department for Transport
Alexander Booth QC, Counsel, Staffordshire County Council

WITNESSES:

Philip Atkins, Clive Thompson and David Hindle (Staffordshire County Council)

IN PUBLIC SESSION

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(At 4.05 p.m.)

1. THE CHAIR: Before I start the main proceedings, I'd just like to say a few words. Last week the Committee completed its rights to appeal challenge hearings and I'd like to announce the Committee's decision in relation to those hearings, in relation to Woore Parish Council, Celia and John Gollins, Mr and Mrs Morris, Amanda Jones, Alan Melvin and the Carter family. The Committee has determined that these petitioners do not have the rights to have their petitions heard by the Committee.

2. I am conscious the petitioners will be disappointed by this news, but the petition process exists to protect the rights of individuals and organisations whose property or other interests are directly and specifically affected by the Bill. The Private Bill Office published guidance in December on the types of petitions for which the Committee would not be likely to grant a hearing and it stated, 'Your petition is not likely to be considered by the Committee if your concerns are general, for example, if they're to do with traffic congestion or air pollution, which may be better represented by a parish or local council group or authority.' All of these petitions fall into this category, which is why we have not allowed them through and we would encourage petitioners to make representations through their parish council, or local authority.

3. In relation to the Woore Parish Action Group, Celia and John Gollins and Mr and Mrs Morris of Woore Country Store and Mr Clark, we would specifically ask them to make representations through their parish and county councils. In relation to the concerns of Mr Jones and Mr Melvin, regarding any encroachment of construction traffic onto their adjoining access areas during works, we are sympathetic to this concern and hope that HS2 can give an assurance that this will not happen.

4. We also hope that HS2 will implement a robust reporting method for communication to local residents, should any such problems arise. We hope that these decisions the Committee have made will provide guidance to future petitioners, with similar petitions, who may be considering whether to challenge the Secretary of State's rights to be heard, going forward.

5. In relation to Additional Provision 1, I'd like to remind everyone that the petitioning window for individuals and organisations who are specifically affected by AP1 is due to close on Friday, 27 April, at 1.00 p.m. Information about how to petition

is available on our website, or through speaking to the Private Bill Office.

6. That ends some preliminary words which I wanted to put on the record. I welcome everyone to the first week of the formal petition hearings. Today we are going to hear from Staffordshire County Council, Lichfield District Council, Newcastle-under-Lyme Borough Council and Sir William Cash. Just at the beginning of sessions, I'd like to just put down a marker to everyone on what the Committee are looking for. We're looking for short submissions; we are much more likely to favour those. We are not looking for repetitive arguments. We are not particularly, having read out a statement, interested in people reading out statements. Apologies for the dual standards, but we do have a tight deadline and it's imperative that we keep to this and, in fairness to everybody involved in the process, I will, after warning people, curtail them from speaking at great length, but welcome you all here as part of the process, with those provisos.

7. I'd like to start by inviting Staffordshire County Council to start today's proceeds.

Staffordshire, Newcastle-under-Lyme and Lichfield Councils

Submissions by Mr Booth

8. MR BOOTH QC: Good afternoon, sir. Thank you very much. I should firstly say that I appear on behalf of both Staffordshire County Council and also Newcastle-under-Lyme Borough Council and also Lichfield District Council, those being the relevant local authorities, for the purposes of the matters with which this session is concerned. Sir, I am not going to take more than a couple of minutes in opening. I know that time is precious and that the Committee need to keep a strict handle on things.

9. So the purpose of today's session is to address two matters, which the Committee has, as I understand it, identified as being suitable for discrete consideration. Firstly, that is to say the lowering, potential lowering of the Kings Bromley viaduct and, secondly, the replacement of the two Whitmore and Madeley tunnels, with a single lengthened tunnel.

10. Sir, first the good news, and that relates to Kings Bromley viaduct. Sir, there have been ongoing discussions regarding the content of an assurance from HS2. HS2

provided a revised assurance last week and there have since been further discussions and HS2 have today, that is to say this afternoon, agreed to further revisions. They have agreed to the inclusion firstly of a good faith provision in the draft assurance, and also a provision as to engagement and, sir, on that basis, Staffordshire County Council and also Lichfield District, which is the relevant district, are content with that assurance and as such, sir, we don't propose to address you upon it.

11. THE CHAIR: Well thank you for all the work you've done behind the scenes on that; the Committee appreciate it.

12. MR BOOTH QC: Well, it's not really my work. It's the work of others, sir, but I'm very grateful. Sir, turning then to the tunnel. Sir, again, I know the Committee is familiar with the issues and also familiar with matters on the ground, because I understand that you have at least walked some of that ground. What we do say is that the broad position can be summarised as follows. Two short tunnels, of each some 700 metres, are currently proposed.

13. I put it in those slightly vague terms because, as the Committee will be aware, HS2 last week suggested a revision to extend the length of the Whitmore tunnel. We say that those two tunnels should be replaced by a single tunnel of some 6,400 metres. So we say the adoption of that single tunnel will result in multiple benefits, both of social benefit and environmental benefit and so, in very large part, that isn't actually disputed by HS2. What HS2 says is that the additional cost that would be incurred in delivering that single tunnel would be excessive, as compared to the benefit it would deliver. Essentially, what's happened is, they carried out a balancing exercise and they have come down in favour of a two-tunnel scheme, so we recognise that there is a balancing exercise to be undertaken, but we say their balancing exercise is not sound and that really the weighting is wrong in both sides of the scales.

14. Firstly, we say that they have not recognised the weight which should attach to the harms which would result from the two-tunnel scheme, as compared to the single-tunnel scheme, and in particular in that regard, we are going to point to the loss of some six hectares of ancient woodland and that will be, as the Committee is aware, a resource which Natural England, a statutory consultee in such matters, regards as irreplaceable and, sir, we do say also that that is a harm, i.e. the loss of ancient woodland is a harm

which national planning policy contains a strong presumption against. So that is one side of the picture.

15. The second alternative side of the scales is this. We do say that HS2 have overstated the costs to be incurred in a single-tunnel scheme. We say the costs are materially smaller than identified, and we say also that the costs differential between a two-tunnel and a single-tunnel scheme, that also is far smaller than has been identified. In due course, the Committee is going to hear from an expert witness, who is going to speak to this issue, but I flag, in advance, two particular issues which we say are relevant in this context.

16. Firstly, sir, the tunnel-boring technology, which it is proposed be used in the context of either the single or the two-tunnel scheme and, secondly, we point to the ground through which these tunnels, or this tunnel, is going to be driven, because we say also that that is a very relevant consideration, in terms of its suitability for tunnelling. So we are going to call three witnesses.

17. Firstly, to my right, Councillor Philip Atkins, leader of Staffordshire County Council, who is going to provide some context to what you will hear subsequently. Second, we are going to call Mr Clive Thompson. He is an assistant director at the council, who has charge of Staffordshire's response to HS2, both in respect of Phase One and also Phase 2A. He is also a chartered engineer and I believe some of you may have actually met him in the context of the site visit that you undertook last month, earlier in the month. Thirdly, sir, the Committee is going to hear from Mr David Hindle. I don't know whether you have a CV from Mr Hindle yet. We've provided one, but it may not have come before you. That was to avoid me having to speak with a great panoply and fanfare about his qualifications. If it hasn't reached you, I can certainly provide that fanfare but, sir, we do say he has a vast experience of delivering, and managing and advising on tunnelling and engineering projects, both in a civilian capacity and in terms of a military capacity. So you'll hear from him in due course, but you can note that projects he's been involved in, very close to home, are firstly project managing a Jubilee Line tunnel at London Bridge.

18. THE CHAIR: I think we've done a mini-fanfare already. Shall we do the full fanfare when he comes? Shall we get on with number one?

19. MR BOOTH QC: I almost reached the end of the fanfare.
20. THE CHAIR: I'll cross it off my list of things to do, then: fanfare one.
21. MR BOOTH QC: Marvellous. Well, sir, without further ado as they say, I am going to ask Councillor Atkins to address you.
22. THE CHAIR: Thank you.

Evidence of Mr Atkins

23. MR ATKINS: Well thank you very much for seeing us today and taking the time to hear what is really important for Staffordshire. I've been leader of the council since May 2009, a member of the county council since 1987, so I am Staffordshire born and bred and lifetime resident and my family have farmed in the county. For a timely memorial, we bought our first farm and were indentured in 1760, so I am a seventh generation farmer, so I understand the background to it, and also a member of such matters like the LGA Resources Board and vice-chairman of the county council network.
24. Staffordshire itself is –
25. MR BOOTH QC: Can we skip on? I think, now we've had the councillor's introduction, we could probably move on. Yes, thank you very much.
26. MR ATKINS: Yes. Staffordshire itself is a large county. The population of the county council is 860,000 and with Stoke-on-Trent it is 1.1-1.2 million. As you can see from the slide, the West Coast Main Line goes all the way through the county, as does the proposed Phase 2A of HS2, and running alongside, in many ways, the M6 and the M6 toll road, so we're used to having large transport projects running through us. It hasn't actually got the canal network in there, but that's near me as well. We've got beautiful bits, round Rugeley down in the south, Cannock Chase, up in the north, the Peak part, and although we may have a reputation as being the industrial revolution, we have got actually some beautiful countryside in Staffordshire itself.
27. When we first heard about the HS2 proposals, we provided all of the county councillors affected with well £5,000 and £3,500 on Phase 2A, to help their

communities organise meetings, so that they could find out what was happening in the area and what needed to be done, so that they could make their point of view. So in Phase One petitioning, we particularly wanted to try and lower eight kilometres of a line in Lichfield, passing underneath the West Coast Main Line and under the A38, just north of Lichfield, instead of over it. This would have been quite a blight on the residents of North Lichfield in particular and the villages around it, but of equal importance was the Handsacre Link, which connects HS2 to the West Coast Main Line.

28. This link is of real economic importance to Stoke-on-Trent and Stafford, by the use of javelin trains that would be able to travel on West Coast Main Line and then go on to the high speed line at the higher speeds, so also lowering the vertical alignment, hence these. I think this points to the fact we recognise that the project is happening, we are not trying to be obstructive, we are trying to make points of importance known, so that we can get the project done, with making sure our community's voices are heard, minimising the environmental impact that the line will have on our beautiful countryside, but also, with an eye to the future, maximising the economic impact of advantages that could accrue from the line itself. So we've been quite pragmatic about it.

29. Moving on to the next slide, as Alex Booth has just said, it seems that the Kings Bromley viaduct can be lowered and we're concentrating on Whitmore Heath to Madeley tunnel. These are points of particular interest to us as a county council, alongside the other 36 petitioning points that we've brought, within our document, to Parliament.

30. THE CHAIR: We'll focus entirely on the tunnel. There will be an opportunity to come back and look at everything else. I don't want to confuse the Committee or anyone else. Just be totally forensic, so anything that's not to do with the tunnel, please cross a line through it. So I'm hoping to lead the way for others.

31. MR ATKINS: Yes, I certainly have. We're concentrating on the tunnel itself. Further important issues will be considered in due course and we will continue to negotiate, but I think the things that really need to be taken into consideration with the tunnel is the ecological benefits. There's an ancient woodland within that area that would disappear. The landscape and visual aspects, the impact of highways on closures

and of construction traffic itself, the heritage impact, the noise impact and the loss of some prime agricultural land through the construction of the land itself. I'd like to hand over to Clive Thompson and Mr Hindle, who are experts in this, so I think I'd like to, with brevity, let Clive Thompson speak to you.

32. MR BOOTH QC: Sir, if that's okay, we'll call our second witness, who is going to put flesh on the bones unless, that is, Mr Mould has any questions for the councillor?

33. MR MOULD QC (DfT): I wonder if I could just ask one question of the councillor and for that purpose we'll put our P352, which is a convenient illustration on plan of the two propositions that are in debate before the Committee, and we can see the twin-tunnel scheme, which is in the Bill, which is in the top half of this, beginning with the southern portal of the Whitmore Heath tunnel, at this point here, taking us up through the Whitmore tunnel, northern portal, the railway running and, indeed, cutting through Whitmore Wood and down to the River Lee viaduct, and then across Manor Lane and then into the Madeley tunnel and beyond, at this point here, and then the single-tunnel alternative, we can see the Whitmore Heath, the southern portal, and this proposition extended southwards, so that it's away from the A53, which is the road that is running across the plan here, and then the tunnel, the route is we'll have one of two vent shafts to the south of the disused Stoke to Market Drayton line, beneath the West Coast Main Line here, approaching the second and northernmost of the two vent shafts and then, continuing in the tunnel, until it emerges from the same point as the Madeley tunnel, north portal there, so that's the basic proposition.

34. Now you will be aware, councillor, that there are those in Staffordshire who support the introduction of a construction railhead and a maintenance base, at a point shown here as Aldersley Rough.

35. MR ATKINS: Yes.

36. MR MOULD QC (DfT): I just want to understand your council's position in relation to the choice.

37. THE CHAIR: We don't need to go there, because we're only discussing the tunnel at the moment.

38. MR MOULD QC (DfT): I just wanted to understand what Staffordshire County Council's position was, in terms of the choice between the two, and I'm not sure you have that clearly set out on the documents in front of you. If you don't think that would be helpful, I won't ask the question, but –

39. THE CHAIR: Go on, go ahead.

40. MR MOULD QC (DfT): Yes, it's simply this. Staffordshire County Council, you clearly support the single-tunnel scheme. Can I take it from that, that you favour that as a change to the Bill, over the possibility of shifting the railhead and the maintenance space from Stone to Aldersley Rough?

41. MR ATKINS: That's an interesting question. I think that we've been trying to be very even-handed with our residents and allow them to make their voices heard, so all of these groups have had some help. We've come down on the basis that we think that we need to mitigate as much impact environmentally as we possibly can. It's not our decision where the railhead is put, but if it is put at the Yarnfield Stone site, then there is a massive amount of, within our petition, environmental impact and traffic impact that needs to be addressed, as well as in this petition as well, so I can't see why two communities can lose out.

42. MR BOOTH QC: It may be that also Mr Thompson can assist further in this regard, to the extent that Mr Mould is saying, well, which side of the line do you come down on, i.e. are you in favour of the tunnel, or are you in favour of the depot.

43. THE CHAIR: I think we can make it, if I can ask a question. Are you in favour of the tunnel option?

44. MR ATKINS: Yes, we're in favour of the tunnel.

45. THE CHAIR: That's fine. That's all we're looking at today. Let's move on.

46. MR ATKINS: Yes. Fine.

47. MR MOULD QC (DfT): That's all I had to ask.

48. THE CHAIR: No, no, that was helpful actually in the end, but nevertheless, let's move on.

49. MR BOOTH QC: So we're going to have a laser focus on tunnel issues only?

50. THE CHAIR: Brilliant.

51. MR BOOTH QC: Thank you very much. And, sir, just to introduce Mr Thompson very, very briefly, he's the lead officer with responsibility, as I said, for HS2 at Staffordshire County Council. He's a chartered engineer and he's going to address the Committee in relation to impacts caused by this two-tunnel option, as compared to the single-tunnel option, setting out, if you like, the benefits which I don't consider – I don't understand to be in significant dispute between the two schemes.

Evidence of Mr Thompson

52. MR THOMPSON: Thank you. Okay, so good afternoon everyone. Just as a slight introduction perhaps, obviously I've been working with communities in Staffordshire since 2013, both on Phase One and Phase Two, and I guess the council's always taken the view, a pragmatic view, to make sure the final design, when it's complete, we recognise it's a national infrastructure project and we want it to be something we can be proud of, so we've definitely taken that view and we've chosen very carefully, in terms of the petitioning items. So in terms of Whitmore and Madeley, the design as it currently stands, we feel that there could be a much more elegant design solution and I think that's a key point.

53. THE CHAIR: Sorry, could we just check on the acoustics. We can't quite hear you and perhaps maybe sitting a bit further forward, nearer the microphone, and then we'll see how that goes.

54. MR THOMPSON: Can you hear me better now?

55. THE CHAIR: Thank you.

56. MR THOMPSON: Okay. So as I said, the key element is that we feel that the design between Madeley and Whitmore can be improved and to provide a much more elegant design solution, so that's the key point. There's a number of other issues, which are in terms of the single-tunnel solution. Firstly, there's tunnelling already been proposed by the promoter, there's actually a temporary out-of-use railway infrastructure in the area and that's perfectly positioned at the centre of the tunnel, which we think

could be used and, of course, Crewe, the significant freight depot, just six miles to the north of the area, could be used in terms of construction purposes so there's a number of issues which come together, which sort of lead our thinking there's something better that can be done.

57. Tomorrow, you're going to hear from local community leaders and I'll be leaving it to them to talk about community impacts, which obviously are substantial and I'm sure they can more eloquently express that, because ultimately they will be living with this, both in the construction phase and the operational aspects. So just before I go into more detail on ancient woodland and other matters, my colleague, David Hindle, will talk about the engineering aspects of the tunnel, so I want to look at ancient woodland, landscape and visual, highway impacts, heritage impacts, noise impacts and agricultural impacts.

58. So the first slide you have here is the Whitmore Wood ancient woodland and when we all went on the site tour, we actually passed that, and I think the really important point here is that this has been defined as ancient woodland by Natural England and Woodland Trust, I understand, are appearing tomorrow, so they will provide much more information and detail on that.

59. MR BOOTH QC: I should make it clear, of course, that Mr Thompson is not an ecologist, nor an arboriculturalist, so to the extent that you have detailed questions as to ancient woodland, the Woodland Trust is probably the better recipient of those questions.

60. THE CHAIR: I understand.

61. MR THOMPSON: But I think the important point is that it's been continuously wooded since 1600 A.D., at least 1600 A.D., and as HS2 have recognised this, so you can't mitigate a loss of the ancient woodland. Next slide please. So here we see the plan of Whitmore Wood and some 33% of it will be destroyed, that's six hectares, and I think it's true that when we passed the site, we did comment that a number of the areas have been planted with conifers, as well as the broadleaf, as displayed on the plan there.

62. MR BOOTH QC: Might I just jump in there, because it might not be clear to members of the Committee. As Mr Thompson says, there's broadleaf and there is

ancient woodland that's been replanted with conifers. It's all ancient woodland, but just so you're clear, the area that is proposed effectively to be lost is that area which is slightly lighter in hue, so the green is all broadleaf, but the lighter hatching is the area of green broadleaf that will be lost. The blue is all replanted with conifers and the lighter blue is the area of the conifers that is going to be lost, so I hope that's clear.

63. MR THOMPSON: And so the value of the ancient woodland is in not just the type of species of the trees, but actually the soil and the habitat beneath the trees, because clearly there's been a continuous 400 years of growth, which cannot be replaced, so that's a really key point and so we've done our history and it's going back to Elizabeth I, a long, long time, at least Elizabeth I.

64. MR BOOTH QC: I think if we have the next slide.

65. THE CHAIR: Can I just ask you to speak up, apologies.

66. MR THOMPSON: So here's a view along the centre line of the routes. Again, I think we sort of just skirted the edge along the footpath, on the site visit, and these are native bluebells, which are indicative of ancient woodland, and 11 plant species were identified in the ES, including native bluebells seen here.

67. THE CHAIR: It's trees.

68. MR BOOTH QC: It's trees, and you know what they are.

69. MR THOMPSON: There we go. Just one thing that we haven't touched on is the wildlife aspect. This is a designated wildlife site, so there's some images here, which are of significance, so it has been identified. So 86, so I think the summary here is that this is a significant impact on Whitmore Wood and careful consideration needs to be given, in terms of any ancient woodland being lost in Staffordshire and, indeed, the UK.

70. MR BOOTH QC: I think just to pause there, in terms of updating matters, can we flick to slide P347 and if that's not easily done, yes, just to update matters, that is HS2 slide, which in the third row shows a loss of woodland and ancient woodland in particular, of some 6.7 hectares. As we understand matters now, following the decision to pull back the southern portal, there would be half a hectare retained so that, in fact, what we see is a figure of 6.2 hectares being lost on HS2's two-tunnel scheme, as

compared to a .3 hectare loss in the single-tunnel scheme.

71. MR THOMPSON: So the really important point, if we go for the tunnel option, Whitmore Wood would be saved and the ancient woodland would be saved. So moving to landscape and visual. The Committee members will recall the landscape of the Whitmore Wood and Lee Valley area from their site visit. It doesn't have a national designation, such as an AONB. Members will recall it's rural in nature, even with the existence of the West Coast Main Line running through it. I think, on that point, Victorian engineers, when they built that line in the 1830s, they took the obvious route, which is clearly a significant challenge for HS2 to get over, and our view is rather than get over it, you need to get under it, because essentially the landscape in that area, you're going to have some 21 metre viaduct with gantries on top. This will be a significant impact on the environment.

72. MR BOOTH QC: Can we move on to the next slide?

73. MR THOMPSON: So again, Whitmore Wood, just coming back to the previous mentioned woodland, the line of the track that this photograph is taken from, Snape Hall Road, and the line of the track is effectively driving straight into the woodland there, as you can see it.

74. MR BOOTH QC: So Whitmore is behind you and I think it's, in broad terms, the route will come over your right shoulder and on into Whitmore Wood and that, I think, by illustration, visual impact.

75. MR THOMPSON: It's a meeting area, a lot of walking goes on, so it's not an area which is completely sterile. It is valued by the local community. Next slide please. Again, in terms of landscape and impact, this is a view from the ES, taken from the ES documentation of Madeley Parish Cemetery, effectively again, the ES document recognised the impact on the cemetery. In a brief visit to the cemetery last week, shows that it's not some dusty cemetery, not visited, not used, it is a key part of the community, fresh flowers at the grave last week, it's a major issue, and if you look at the slide SW, on the second bar there, you can just see the Manor Road overbridge, also the railway passing, so effectively the cemetery is going to be sandwiched from the West Coast Main Line, HS2 and the Manor Road overbridge. It's going to completely alter the area and I'd have to say, in terms of funerals in future, it's going to have quite a

big impact.

76. MR BOOTH QC: Moving on to the next issue, having dealt with ancient woodland and landscaping visual impact, sir, we'll try to take these relatively swiftly. The next issue that you raise is highways impact and if you can speak to slide 10 please.

77. MR THOMPSON: Yes. So I think the first thing to say, in terms of how we impact, is that building Phase 2A in Staffordshire is going to have a massive impact on the highways and there's a whole host of highway matters that we're going to begin with, but we're not going to talk about that today. We are resolving them, hopefully resolving them. If not, we'll be back here in a few weeks' time, but the area around Whitmore and Madeley does have a number of A-class roads, but that's probably about it. A lot of the road network off the A-road network is either C-class classification, or unclassified, so it's very rural in nature, so in terms of the highways impact, these are changes which, if the tunnel was promoted, wouldn't be required. So the southern portal, I understand now that change has been proposed.

78. MR BOOTH QC: Yes, the first dash on your slide there, that's not a consideration, because I think HS2 are also proposing pulling back the southern portal to the south of the A53 now, so that is not a benefit of the single-tunnel scheme. The four further bullets, to the bottom of the page, those are all benefits which would remain, which would be gained sorry, by promotion of a single-tunnel scheme, over the two-tunnel option.

79. MR THOMPSON: Next slide please. In addition to that, we think that vehicle movements associated with a number of satellite compounds will be reduced or indeed removed. Clearly further work would need to be done on that, but just looking at it, it's going to have a significant impact, in terms of vehicle construction movements in the area, which again is important, because the road network, as you noted on your site visit, isn't great. The A roads there, we're not talking of modern standard A roads, we're talking about A roads which have got historic classifications to them.

80. MR BOOTH QC: I think the next three slides are all examples, pictorial examples of roads that are going to be impacted. Snape Hall Road, the position there please?

81. MR THOMPSON: Yes, Snape Hall Road is certainly closed under the scheme,

but also altered in this area. You can see from the photograph there it's a rural road, you're talking about putting construction traffic down there. It's going to make a big impact, not on a temporary basis, but also on a permanent basis, I would suggest.

82. MR BOOTH QC: The next slide is Common Lane.

83. MR THOMPSON: Again, the proposal is for that to be widened for construction traffic. Again, a tunnel option, not required, no changes.

84. MR BOOTH QC: And then Red Lane bridleway, is the next slide. What's the position here?

85. MR THOMPSON: Red Lane bridleway and there's obviously a number of public rights of way are affected through the route, which would be unchanged, if the tunnel option was presented. Red Lane bridleway is actually required to get over significant infrastructure over the scheme. Again, if the tunnel option, this view would be maintained, so it's significant.

86. MR BOOTH QC: And I think the next slide is an attempt, not a particularly helpful attempt, but an attempt nonetheless to show where various of these impacts would be felt. Obviously the printed slide you have is very small and difficult to read, but if you blow up the slide you can, I think, appreciate where some of these impacts are, but it's there for illustrative purposes.

87. MR THOMPSON: So these aren't localised, the benefits are going to be spread along the final route and, indeed, I would suggest even further than that, if you get the construction right. So moving to heritage. So a number of assets shown here, which would be impacted by the current scheme, which the impact is going to be greatly reduced, if not removed, if the tunnel option is proposed.

88. MR BOOTH QC: And I think of the six heritage assets which HS2 have identified as being adversely affected by the line in the event that the two-tunnel scheme proceeds, you've chosen one for illustrative purposes and I think if we go to the next slide we can see that, Hay House Lodge.

89. MR THOMPSON: This is a frontal of Hay House Lodge, which is grade II listed, and the photograph was taken approximately on the line of route, looking towards the

scheme. The line of route here is on embankment. It's rising left to right as it crosses over getting on to the viaduct.

90. MR BOOTH QC: And I think, just so that the next two slides make sense, if you look at – you can see the listed building there in the mid ground. In the foreground there is a track, a route through the grass and a witch-like tree on the left. And if we skip on to the next slide, please.

91. MR THOMPSON: Again this is a very crude photomontage. The top photograph is the as-is. The bottom photograph, this is looking roughly from the frontage of the house, and there's a black line that we've put on, you can just see that on the lower photograph, and I think it's probably fair to say this photograph probably doesn't do it justice. The scheme again is rising up to the 20-metre-high embankment to the left. Okay?

92. MR BOOTH QC: Yes, and if we move to the next slide I think we see HS2's recognition of the impacts.

93. MR THOMPSON: Yes. So I mean these are words contained in the ES. Hay House Lodge is going to be impacted and that impact will be removed if we go for the tunnel option.

94. MR BOOTH QC: And, as I'm sure the Committee is aware, I mean HS2 say in the environmental statement that the view's an important part of its historic interest. As with all heritage assets –

95. MR WIGGIN: So of the two-tunnel option goes ahead will you be delisting this as the local authority?

96. MR THOMPSON: That would be a matter for the district council, really.

97. MR BOOTH QC: I should say it's not – I don't think even it would be up to the district – it wouldn't be up to Staffordshire County or, indeed –

98. MR WIGGIN: It's up to the county council.

99. MR BOOTH QC: No, no – yes, certainly my understanding would be that it –

100. MR WIGGIN: Listing is. Listing is county council, probably.

101. MR BOOTH QC: I –

102. MR MARTIN: Not heritage.

103. MR WIGGIN: No, I know; local authority does the listing on behalf of English Heritage.

104. MR BOOTH QC: Yes, but I think we would have to take the view, or rather the county council would have to take the view of Historic England in this regard.

105. MR WIGGIN: No. If the historic interest is removed –

106. MR BOOTH QC: Yes.

107. MR WIGGIN: – then there is no need for the listing. So if the two-tunnel option goes ahead, will you be removing the listing as a local authority? Or will you continue to insist that this is a grade II house? How fundamental is your important part of its historic interest to its listing? You've prayed in evidence for it, so, what's the answer?

108. MR THOMPSON: I think I'd have to defer to colleagues on that and come back –

109. MR WIGGIN: Right.

110. MR THOMPSON: – to you in writing on at.

111. MR BOOTH QC: We can certainly provide that view, sir, but then, with respect, Mr Thompson isn't from the relevant party and isn't in a position –

112. MR WIGGIN: No, no, but it's an important part, you've just said, an important part of its historic interest.

113. MR BOOTH QC: Yes, well then it's – to be clear, though, of course, that isn't our assessment. That is a joint assessment because that is HS2's assessment. They say that the views across are part of its historic interest. That is to say, contribute to its heritage significance. And, on that basis, sir, if you'd like the view from the county council we can certainly have an officer at district level or a relevant officer from –

114. MR WIGGIN: Whichever is the right one.

115. MR MOULD QC (DfT): Might I just say that, in my experience, it would be astonishing for an indirect effect of this kind, albeit one which is identified as being significant, to lead to pressure to delist the historic building whose setting is so affected. One would ordinarily expect that something in the order of a direct effect, some sort of effect on the structure itself, rather than simply on its setting, would be required in order to lead to pressure to delist.

116. MR THOMPSON: Okay. So the next slide, please. So moving on to noise, again these quotes taken from the ES. So that scheme as currently being proposed will have impacts on a number of residential properties as listed on those maps. So there's obviously a reference there to refer to those maps. But just go to the next slide. Okay. Thank you. So this is one of those maps that shows the noise contours on just one part of the Whitmore end. And I suppose the important point to note on here is, maybe stating slightly the obvious, but the impact of the tunnel on the noise contours. So you put a tunnel in and the noise issue goes away from those residential properties. So, clearly, by putting into the tunnel for the whole length between Whitmore and Madeley there will be benefits, noise benefits, for a number of properties that have been identified by HS2, the promoter.

117. MR BOOTH QC: I don't know if that slide is clear to the Committee but what we have on the right – in the centre of the slide is, effectively, a southern portal. That was the southern portal as proposed by HS2. In fact, one needs to pull that southern portal the other side of the A53 and that's, effectively, the area delineated in green. That's the portal area. If we come across Whitmore Heath we then have the other portal and, of course, in the event of a single-tunnel scheme the tunnel would maintain and would go under that. So the properties you see immediately to the south, which it's recognised by HS2 would suffer adverse impacts in noise terms in the event of a two-tunnel scheme, those impacts wouldn't occur in the event of a single tunnel. That's the point we're making.

118. MR THOMPSON: Okay? So if we move to the next slide, please. So I've listed here a slide on agriculture and, obviously, Committee members will no doubt be alive to the impact of the scheme on the farming community and I'm sure the NFU will come

later, and it's obviously important to a royal county, such as Staffordshire. This slide shows the significant benefits that a single-tunnel scheme would have over the promoter's scheme: something like a 35% reduction in land required on a temporary basis and a 75% reduction in land on a permanent basis. These are significant numbers.

119. I think just pointing out the best and most versatile land as well, it's a matter which I'm sure the NFU will pick up on but any loss of best and versatile land is another significant consideration, I would suggest.

120. THE CHAIR: Sorry, you lost me on percentages. It's a percentage of the agricultural land in Staffordshire?

121. MR THOMPSON: No. So this is the hectares impacted by the proposed scheme, so looking at 336 loss of agricultural land, temporary, and then under the tunnel scheme at 260, so less land –

122. THE CHAIR: And how big is that number in the context of Staffordshire agricultural land? I've got no idea whether it's 1% or 20%.

123. MR THOMPSON: Oh.

124. THE CHAIR: I'm being slightly ridiculous.

125. MR THOMPSON: That's a figure I don't have.

126. MR BOOTH QC: No. Sir, we can provide the Committee with that information. I would hesitate –

127. THE CHAIR: Well, perhaps the NFU will be, no doubt, listening and will give us some indication when we take evidence from them.

128. MR BOOTH QC: And what I can do, I think, is indicate that in circumstances where development is proposed, which will result in a loss of I forget whether it's 20 or 30 hectares of best and most versatile land, then I think Natural England have to be notified as the statutory consultee, the relevant statutory consultee, in that regard. That isn't to say that that is necessarily a bar to development but it is a notification requirement.

129. MR THOMPSON: And just before we move on from the agriculture, just one other matter. Obviously you will be hearing from individual local residents later in the year, perhaps in a few months' time, and, of course, they're the ones directly impacted by the scheme. But looking at Snape Hall Farm alone, I think my understanding is they will lose some 41% of the holding for seven years and 30% on a permanent basis. So, within those figures that we're looking at there, there are individual cases which are significant and, no doubt, you'll be hearing from those petitioners in due course. So another matter for consideration, I would suggest.

130. Next slide, please. Okay. So coming to the end of my presentation here and I just wanted to touch on disposal of additional material. It's clearly for the tunnelling option there's going to be a lot more material to be excavated and we recognise that. And one of the issues that we've been looking at is how we might be able to assist the minerals and waste authority to assist the promoter with potentially a cheaper option to get rid of the material.

131. So could I just go to the next slide? So I would stress this is just purely one option but there's obviously a number of quarries in Staffordshire, quite a few, actually, near the vicinity of Whitmore and Madeley. It's owned by Hanson Aggregates. It's currently non-operational and it's about 5 to 6 kilometres from Whitmore Heath. There's a void there of around about 1 million cubic metres. Now I'm not saying this is the solution but it's a potential solution and it's worthy of further consideration and, clearly, any such proposal if it was to come forward we'd need to go through the correct process.

132. MR BOOTH QC: And I think that quarry is identified on the next slide, which just shows the quarry's location relative to the route.

133. THE CHAIR: Okay. Carry on.

134. MR BOOTH QC: Yes. So those were the matters that Mr Thompson was going to speak to. Unless there are questions either from the Committee or from Mr Mould that was all he was proposing to add.

135. THE CHAIR: No one's catching my eye for questions. Mr Mould, did you have a question? Don't feel you have to.

136. MR MOULD QC (DfT): I think what I'll do, if it's satisfactory to you, is I'll ask Mr Miller when we respond just to pick up on one or two points of context which have been raised by the witness.

137. THE CHAIR: That seems very sensible. Thank you very much.

138. MR MOULD QC (DfT): I can help with one thing that's fresh in your mind. It relates to the question about best and most versatile land. We just put up volume 3 of the environmental statement. You'll see 2.2.4 gives you the basic data on losses in relation to that category of agricultural land. 1,370 hectares required during construction and you'll see that that represents about 0.03% of the total amount of best and most versatile agricultural land in England and about 1% of the estimated quantity of land of that character in Staffordshire and in the former Crewe and Nantwich Borough Council area.

139. THE CHAIR: Thank you very much. Please.

140. MR BOOTH QC: Sir, what I'm going to do now is ask Mr David Hindle to take the chair next to me. While we do that, though, if I may just come back to the Committee on the matter raised by Mr Wiggin in relation to listed buildings and I've been checking the position whilst we've been proceeding and, just to confirm, it is as follows. Firstly, the county council, as I thought, has nothing to do with listed buildings. Secondly, as regards local planning authorities, that is to say authorities at a district level, such as Newcastle-under-Lyme, they would be the relevant authority to whom an application for listed building consent would be made to the extent that if you had a listed building to which you wanted to works you would seek consent from them and they would themselves seek the views of Historic England.

141. As regards applications to list and delisting, that is undertaken by Historic England. As the relevant authority, Newcastle-under-Lyme would be consulted by Historic England but decisions in relation to listing and delisting, as opposed to applications for listed building consent, they are within the province of Historic England. That's certainly my understanding of the position and I think that's correct.

142. MR MOULD QC (DfT): May I just make it clear, lest anybody be in any doubt, there is no proposal to do anything that would require listed building consent in relation

to any of the listed buildings that have been shown on the slide that you saw. And, of course, lest anybody be in any doubt about that, I don't mean to take a technical legal point by saying we don't need listed building consent anyway. What I mean is, had we needed it we would not have needed it in relation to those various buildings.

143. THE CHAIR: Thank you.

144. MR MOULD QC (DfT): The route avoids them.

145. MR BOOTH QC: And, just to confirm, I mean, I can agree.

146. THE CHAIR: We're all in agreement, Mr Booth. Let's move on.

147. MR BOOTH QC: We're all in agreement. We can move on. Lawyers in agreement. There you have it.

148. THE CHAIR: It's Mr Wiggins's fault, not yours.

149. MR WIGGINS: It's the bold writing that got me cross.

150. THE CHAIR: Okay. Mr Booth?

Evidence of David Hindle

151. MR BOOTH QC: Now, sir, I've already done the fanfare.

152. THE CHAIR: Thank you. And we've got the CV in front of us.

153. MR BOOTH QC: You've got the CV and you can see that.

154. THE CHAIR: Thank you for your time, sir.

155. MR BOOTH QC: Just to confirm, though, in terms of the projects that you've set out there, i.e. selected projects –

156. THE CHAIR: Can we not confirm? Can we move on?

157. MR BOOTH QC: Well, sir, if you can –

158. THE CHAIR: You've done a mini fanfare, a pre-fanfare –

159. MR BOOTH QC: No, it's just a question of relevant experience, sir. It would be only 30 seconds but I don't want to be on the wrong side of you.

160. THE CHAIR: No, let's move on. You have the relevant experience.

161. MR BOOTH QC: Fine. Okay. Well, as –

162. MR WIGGIN: It's all in there.

163. MR BOOTH QC: As regards your evidence, please, can we turn to the next slide, please? What we have there, I think, is a slide that you've already seen. It's a slide which my learned friend took the Committee to already. It shows, in essence, the two schemes: the single tunnel at the bottom and the two tunnels on the top of it. Any comments of yours, Mr Hindle, as regards this slide? Things that you need to draw to the Committee's attention?

164. MR HINDLE: No, it's simply – good afternoon, ladies and gentlemen. It's simply to show the contrast between the impacts of a single-tunnel scheme against a twin-tunnel scheme. What's left at the end of the day will be hardly noticeable. The two ventilation house buildings will be fairly low. They'll be rather unimposing. They'll probably be screened by shrubbery and trees. They'll have an area of hard standing around them for vehicle access and emergency vehicles and general maintenance vehicles. And, of course, they'll have a permanent access probably to Manor Road, although that could be – certainly the shaft number one, the northern shaft, would access Manor Road directly but the other shaft may not.

165. MR BOOTH QC: Before we start talking about shafts perhaps we could move on to the next slide, which is a schematic of the single option. And perhaps, in very broad overarching terms, you could explain how you see this single tunnel being driven, with reference to the two shafts and the various tunnels that you've numbered one through six.

166. MR HINDLE: Yes, the two shafts, the two ventilation shafts, are required by HS2 and I don't propose to change those in any way. They are conveniently located in the Lee Valley and my proposal here is that all or pretty well most of the tunnelling work could be undertaken from the shafts with an adjacent lay-down area for spoil storage

and tunnel equipment and tunnel lining materials stored very close by. The access initially to these two sites would naturally be along Manor Road but it's not proposed that Manor Road would form the main haulage route. That would be a separate route that could be constructed along the West Coast Main Line or other routes that are available.

167. The only impact on Manor Road would be a haulage road that would cross Manor Road between the lay-down area and shaft number one on the left and that would be traffic controlled.

168. The point about the whole scheme here is so that we can split the long tunnel into six shorter tunnels. Now this will offer much more flexibility on how we can go about the tunnelling sequencing in that we don't necessarily need to access the tunnels at the portals immediately.

169. Furthermore, we do have this abandoned railway, which actually, as you probably know, is still intact and could be reconnected to the West Coast Main Line, although this scheme does not absolutely depend on it. It would be very nice if it could. It means that bulk materials coming in to the site and possibly even going out of the site could go along the railway, avoiding all heavy goods vehicles on the road. But that would be the subject of negotiations with Network Rail and, as I said, it's not essential to this scheme.

170. MR BOOTH QC: If we move on to the next slide I think we see – it's a pictorial overview, aerial photograph showing broadly how operations would be undertaken in the single-tunnel scheme with reference to these two shafts, but I think probably what one can usefully do is compare that, if we could flip quickly to the next slide, and we see the relative land takes for the two-tunnel scheme, which, of course, wouldn't be in tunnel at this location and the single-tunnel scheme, if we go back to the previous slide, apologies, where, of course, we would be underground here. Your observations, if you need to provide any, in relation to these slides?

171. MR HINDLE: Yes, this would indicate the maximum area of enabling works that would be needed for this scheme. They are very minor and they're very temporary. The temporary haul roads, as you see, will be laid out so that they interfere as little as possible with the existing field boundaries. You'll notice that the lay-down area on either side that straddles the abandoned Stoke to Market Drayton railway, the

connection to the works site at shaft number two to the south, that would be via the existing over-bridge on the abandoned railway. Obviously, the bridge would have to be checked and strengthened if necessary but it's there and, as far as we know, it's in good condition. Again, that haul road would interfere with the field boundaries on that side as little as possible.

172. MR BOOTH QC: Well, if we move on to the next slide, I think we see in section – sorry, the next slide; the slide afterwards. Thank you very much. We see your proposed single-tunnel in section and you've identified on that slide various types of ground through which a tunnel would be passing. Can you provide your view, please, to the Committee as to these ground types and their suitability or otherwise for tunnelling?

173. MR HINDLE: First of all, all of these ground types, and I'll mention the glacial channel a little later, but they're all rock. They're all a moderately strong/moderately weak type of rock. They're all completely inert types of rock. When spoil is generated from these rock types they don't generate anything nasty at all. All of these rock types, particularly the Sherwood sandstone group, have been extensively mined in the area and to the north. In fact, Liverpool is undermined extensively in that Sherwood sandstone group. The Warwickshire group, the mudstones, siltstones and sandstones, they've also been extensively tunnelled and mined and quarried. They're very stable materials. They're relatively soft. And, in fact, the whole of the formation there, the Sherwood sandstone/Warwickshire group of mudstones, sandstones, siltstones and conglomerates, represent a very easy tunnelling material.

174. MR BOOTH QC: How does that stack up next to, say, London clay, through which, obviously, Jubilee Line and others have been driven?

175. MR HINDLE: Well, it's a rock and the London clay is classified as a soil, although it's a very stiff soil. These are rock and, as such, they're much more competent, they're much, much more resistant to ground movement and settlement. In fact, settlement from this tunnel is likely to be negligible to non-existent. In fact, that would go also for the shorter tunnels but particularly for this tunnel.

176. The depth of the tunnel is certainly sufficient throughout to avoid any issues of settlement where it passes underneath roads and so on. The only point of interest is where it passes underneath the West Coast Main Line. Now, it would pass under the

West Coast Main Line at a depth of about 16 metres, which in rock is vastly more than adequate. There would be almost zero settlement.

177. However, in that area there is the possibility of a glacial channel. Now, this is very vague. It's been mentioned in the HS2 report as being up to 20 metres deep and narrow. Well, there's no actual physical evidence on that site in any boreholes that has actually identified that glacial channel.

178. THE CHAIR: Can I just check with you on boreholes as to what boreholes have been done because in Sir William Cash's evidence, although he said he's asked for boreholes to investigate the tunnelling option, it says at page 3, 'There have been no boreholes for a preliminary investigation of a longer deeper tunnel'.

179. MR BOOTH QC: Well, my learned friend's probably better placed to tell you what boreholes have been dug. You're absolutely right, sir. Sir William Cash has raised the issue on more than one occasion.

180. THE CHAIR: Right. But how sure are we that this is what's under the ground?

181. MR HINDLE: There are some historical boreholes, both deep and shallow, in the immediate area of the Lee Valley and in the Lee Valley itself. These were sunk for the National Coal Board during the 1970s. They're very detailed and they do confirm the presence of these rock types. Also, the Sherwood sandstone group, where it outcrops on the hillsides there, is actually visible and also there are plenty of quarries in that area where this material's been mined. It would be very unusual and, in fact, the geological survey map of this point of the country clearly shows that these rock types are present. The only thing that will be of issue is the extent of that glacial channel, which is likely, in my view, to be fairly restricted and will have only a minor impact on the tunnelling.

182. MR BOOTH QC: Well, that's the point I was going to come on to. And in the event that HS2 were right and there is that glacial channel present, what do you say are the implications for your single-tunnel scheme?

183. MR HINDLE: Well, they will have to be studied very carefully but certainly the tunnelling through glacial deposits is very common in this country. It can be readily accomplished by simple application of a number of techniques that are available:

grouting, dewatering and advance support. There are any number of methods for going through this material. It will not be that bad. We go through far worse ground elsewhere, particularly in London, than this.

184. MR BOOTH QC: On that basis then, let's move on to the next –

185. MR HINDLE: Oh, can I just stay with this site?

186. MR BOOTH QC: Apologies.

187. MR HINDLE: There is one other issue that I just want to show you on this slide. You will notice that there is a dotted red line directly below the tunnel, which is the base of the HS2 option for this scheme. This option showed that the low point of the tunnel was at shaft two and it was envisaged that shaft two would form a sump for the tunnel, which is fair enough and I don't propose to do anything with shaft two; leave it alone, it's in a fine location. The point I'm making is that it does not have to form the low point of the tunnel. If the low point of the tunnel is moved to directly below the West Coast Main Line, where it needs to be at its deepest, the gradient, the southward gradient, out of the tunnel can be reduced from 0.432% to 0.95%, which almost matches the gradient, the northern gradient, on the viaduct. So by doing this we can make the gradients in the tunnel very similar to those across the viaduct. This means that the power requirements for the railway will be more evenly balanced between the two schemes. So that will reduce both costs in terms of putting power equipment in there short term and long term the operation of the railway.

188. THE CHAIR: Very helpful. Carry on. I think that answered Sandy's question.

189. MR BOOTH QC: Yes, I saw that coming. Thank you. In which case we will move on to the next slide because I think this is really quite important. It goes to the crux of the costs dispute between ourselves and HS2. Can you please explain briefly for the Committee what they are looking at there in terms of on the left the mechanised open-face shield and on the right the closed-face earth pressure balance TBM?

190. MR HINDLE: Yes. I'll start on the right with the closed-face earth pressure balance TBM. It's a bit of a mouthful. They're often referred to as EPB, earth pressure balance, machines. These machines are very, very sophisticated. They are being used –

they are proposed for HS2 elsewhere on the project, particularly coming in to London. They are extensively used on projects such as Crossrail. And they're mainly used in soft ground tunnelling conditions, like silts and sands and loose materials, in an urban environment. They are specially designed TBMs, tunnel-boring machines, to reduce surface settlement. And the way they do that is they balance the pressure that's generated by the TBM on the pressure that's generated by the ground as it passes through. And, in that way, it removes to a very large extent the settlement.

191. The problem with this type of machine, it's also very similar to the slurry type of machine that's been proposed for the Cotswolds tunnels. The main feature about this machine is it's very expensive, £15 million to £25 million, and I think HS2 are erring on the cautious side at £25 million but fine, it may well cost that. These are extremely expensive machines and, worse still, even in this ground they would probably not be used for the full potential. In fact, they'd probably run in ordinary mode for much of the time.

192. Contrast with that on the left-hand side, which is called a mechanised open-face shield. These are a much simpler type of shield. They were very commonly used and are still being used. The one shown at the bottom was actually used on a railway tunnel, to dig a railway tunnel only two years ago. They're a much simpler built machine. Their history goes back quite a way but most of London Underground was constructed using these machines. In fact, Westminster station only 100 metres away from us, the two platforms at Westminster station were constructed by exactly one of these machines.

193. MR BOOTH: QC: Sorry, to be clear, which two platforms are you talking about, which line?

194. MR HINDLE: The Jubilee Line.

195. MR BOOTH QC: The Jubilee Line.

196. MR HINDLE: Yes.

197. THE CHAIR: I'm a bit confused because HS2 are going to have to buy this machine anyway, aren't they, for the two ends. Your assertion seems to be HS2 are

looking to use a boring machine that costs £15-25 million and actually you think they can use one that costs £5 million. But they're going to have to have the machines anyway for the two elements of tunnel.

198. MR BOOTH QC: To be clear, Mr Hindle can address you to the extent to which you need a new machine for each tunnel that you're going to drive but certainly in the costs analysis that's been provided by HS2 as against our scheme, it's being said that they will need to buy these machines for our tunnel. So in circumstances where the totality of that cost is being set against our scheme, what we're saying –

199. THE CHAIR: Perhaps when they come back to us they can say under their scheme how much is being spent on these machines.

200. MR BOOTH QC: Yes.

201. THE CHAIR: And if they bore how much they were intending spending on the machines that they felt required. Then we can work out if there's a difference and whether that's a significant element of the 150 additional cost –

202. MR BOOTH QC: Yes well, on your point, Mr Hindle, perhaps you can explain. What would you anticipate as regards the machines, tunnel-boring machines, whether it's the mechanised open-face or the closed-face earth brand? That one.

203. THE CHAIR: Yes, whichever one.

204. MR BOOTH QC: Whichever one. Are we looking at HS2 buying, say the machines on the right, and utilising that for the entirety of the project or are we looking at something else?

205. MR HINDLE: Usually on major projects such as this the machines are bought from new from the manufacturer. Once the machine has completed its allocated tunnels it can be sent back to the manufacturer and a cost can be recovered. It's nowhere near the cost of the new but it is a significant cost. That tunnel is there. That machine can then be refurbished by the manufacturer and resold back to the original owner if required or to someone else.

206. THE CHAIR: I'd like to see some numbers on that. I'm going to come to Sheryll

Murray and then I'm going to come to Mr Mould if he's got any comments as well.

207. MRS MURRAY: My question was going to be ask clarification from Mr Mould because surely if they purchased a machine that they've used on Phase One in the Cotswolds that may be available to be used on this scheme but it may have to be refurbished in the interim. So is the £15-25 million for the refurbishment of an existing machine or is it costed on a completely brand new machine?

208. MR MOULD QC (DfT): Well I'm very grateful for you to have raised that because I was going to deal with exactly that point. The assumption that we have made for the purpose of the costing you have in front of you is that for the single-tunnel scheme we would buy two earth pressure balance machines, each costing £15 million. So our total outlay to construct the single tunnel would be £30 million. As I understand it, Mr Hindle is saying he would forgo that cost but instead he would pay £15 million because he would buy three mechanised open-face shield machines at £5 million a shout. So the difference between us is £30 million on our case, £15 million on his case, £15 million is the difference in terms of our costings on this point.

209. MRS MURRAY: Thank you.

210. MR HINDLE: There's a little bit more to it than that.

211. THE CHAIR: I think, well, if we have to let's go into the detail but if that's broadly directionally correct. I'm in your hands as to whether you want to add more detail.

212. MR HINDLE: Yes, just very briefly. Once you've bought the machine you have to buy all the back-up equipment that goes with it. Now you'll find in HS2's tunnelling cost review where they talk about pressure balance machines and slurry type machines, which are different but similar. But it's the overall cost of one of these machines can be nearly double that amount. That's particularly so if you have very long tunnels because you can imagine all of the equipment that's needed to service that machine over say a 6.4 kilometre length. This is one of the reasons why I want to reduce the length of the tunnels to two kilometres or not more than 2.5 kilometres. That way those costs of those back up and train equipment behind these tunnel-boring machines can be drastically reduced. So it's not just the difference of £15 million, you could maybe

double that figure when you add in all of the other costs.

213. Last point is the power requirements for the mechanised open-face shield, which could be made in this country by the way just up the road in Oldham. It doesn't have to come from abroad as will all of the close-face type machines. The power requirements for the mechanised open-face shield are a fraction of what a closed-face pressure balance TBM requires. Added to that you have the much more flexible machine in that it can be maintained easily. It's relatively simple to operate. It's a very basic machine and it is tried and tested.

214. MRS MURRAY: Can I just ask about the efficiency in time?

215. MR HINDLE: Right.

216. MRS MURRAY: Would the mechanised open-face shield operate and dig the tunnel as quickly as the other one?

217. MR HINDLE: A very good question, much quicker. The closed-face machine would probably operate at about three times the speed of the mechanised open-face shield. That is why I'm proposing to use three. It may even need four machines but there's plenty of money in the kitty to have those extra machines. The main issue though you have to remember is the lead-in time to purchase these machines. A mechanised open-face shield could be specified, designed, manufactured and onsite within three months. The closed-face earth pressure balance machine, if there isn't one immediately available off the shelf, can take anything six months to a year.

218. THE CHAIR: Just to clarify what we're doing here today, we're mainly looking at whether there should be a tunnel between points A and B. We could come back to the issue of how the tunnel is constructed and some more detail at a later stage but it's the in-principle case. It's very relevant in terms of the overall picture and the numeric difference but we don't have to bottom these details at today's session.

219. MR HINDLE: Yeah I've finished with the technical side. I've finished with the technical side of this.

220. THE CHAIR: Thank you. We may come back to it. I think a number of us would be interested to do so but it's the broad principle of whether we should tunnel.

221. MR BOOTH QC: Just to pick up on the point just raised in terms of timing if we go to HS2's slide I think they both, I think HS2 has provided certainly an example construction programme which shows that both the single tunnel and the two tunnels can be done on a four-and-a-half year works programme. I think if we skip quickly to your slide A25(9), that is two slides ahead, just to be clear, we can see in the footnote we know how many, it's three TBMs are working 24/7. Three was the number you identified before. How many years do you say this would take in order to construct your single tunnel?

222. MR HINDLE: Yes the conservative advance rate for each of those three machines is six metres per day, which is conservative. They could do a bit more than that maybe eight metres a day. We could complete the job within three years. It's a fairly big ask is this but it's perfectly possible provided we can get good access to that central working site. There's no reason why we can't. Now why can we do this? It's very simple.

223. THE CHAIR: Sorry, I think we can do it in the same time or less time. That's sufficient. We can come back if we need it.

224. MR HINDLE: That's the point.

225. THE CHAIR: Anything else, Mr Booth?

226. MR BOOTH QC: Thank you very much. That was the only point we're seeking to establish. If we skip back one slide I don't ask that you read all of these out, the Committee has them. This is where you set out the advantages of mechanised open-face shields.

227. THE CHAIR: Let's move on.

228. MR BOOTH QC: Sorry, sir, I was just saying if there was anything you needed to add to that but I presume that there wasn't.

229. MR HINDLE: Only the simplicity and the fact that they can be manufactured just up the road.

230. THE CHAIR: Sorry when I said we'll move on I meant we should move on.

231. MR BOOTH QC: I'm sorry, I'm a little deaf.

232. THE CHAIR: No, no, no, Mr Booth in fairness, perhaps I was unclear, I wanted to move on from the mechanism for boring because we're looking at the principle. Because, heaven forbid, we might say we don't want any tunnels at all. In which case the method of boring is not relevant. We can come to that later if we need to. Sandy?

233. MR MARTIN: Chair, I just wanted to ask both Mr Booth and Mr Hindle on the P35(2) the applicant's map with the shafts for twin-bored single tunnel, you can see that they are proposing a very long road up to the south shaft. That's on the bottom map there, you see in the red a long road from Whitmore along to the second shaft. Why do you suppose that they are proposing that route to get to the shaft rather than from the disused rail line? I would have thought it would be cheaper to do it from the disused rail line but do you not think there might be a reason why they can't do it from the disused rail line?

234. MR HINDLE: Well I think there's a proposal in the long term to reinstate that line and perhaps they're trying to just preserve the route. But it really doesn't matter which way.

235. MR MARTIN: Okay, thank you.

236. MR HINDLE: Their option is perfectly sound.

237. MR MOULD QC (DfT): I'm sure you've picked this up but our assessment of the single tunnel option is based on the tunnel being constructed from south of the southern portal from a large construction facility to the south of the A53, which is predominantly road based, road served. That road would simply be used to provide access for construction to that particular vent shaft.

238. MR MARTIN: And not the tunnel itself?

239. MR MOULD QC (DfT): Yes.

240. THE CHAIR: Any questions for Mr Booth or Mr Hindle? I was going to propose to move to Mr Mould.

241. MR BOOTH QC: Oh, yes.

242. THE CHAIR: Oh, right.

243. MR BOOTH QC: What I was going to do is skip past the last two slides but if we go back to slide A25(10), which is where we got to in the scheme. He's there, Mr Hindle, I'm going to paraphrase, setting out a reductions in cost and risk. We don't have to have that read out nor indeed the advantages of the single-tunnel scheme as he set out in the following slide. What I think the Committee would benefit from but please tell me I'm wrong if you don't want to hear, is that on slide A25(12).

244. THE CHAIR: This is useful.

245. MR WIGGIN: Very useful.

246. THE CHAIR: It seems that the contention is – you're saying everyone agrees that the environment would be better if there was a tunnel. There's questions about the costs and the balancing between the two. So this gets to the nub of it.

247. MR BOOTH QC: Well that's it. We've been building to this moment, sir. Apologies.

248. THE CHAIR: Excellent.

249. MR BOOTH QC: We did, we feel, have to set out some of those benefits so you had them in mind but this is obviously where we go to now. I'm just going to introduce very quickly what we've got here. This is a slide which can usefully be compared and obviously one can only really have one up in front of one at a time. But this slide is to be compared with slide P34(2), which is a costing slide which HS2 have used to compare our costs with theirs so to speak. So we've used the same tabulation and where you see red text on this slide, this red text is text that is changed from HS2's costings. Where the text is black that is effectively figures or wording which remains the same between the two slides. So in terms of the first row tunnelled, the wording should be in black. That's blown my theory out of the water straight off the bat. The wording should be the same, apologies. The proposed scheme we have got at £160.64 million as against a cost for our scheme of £314.59 million. In terms of those two figures they are both reductions on the P34(2) slide. Perhaps very briefly, Mr Hindle, if you can explain why we see those figures reduced?

250. MR HINDLE: Well the first obvious reason for reducing them is the cheaper

machine. That does take a large portion of the costs out. The other reason to bring the figures down is that we consider that these tunnels are in a very open environment, very low risk in a very, very good tunnelling medium compared to elsewhere on HS2. So the tunnelling costs taken from the Treasury forecasts and other sources can be reduced more to the lower band of the average figures per kilometre. So what we've done is we've reduced accordingly the single tunnel option but also we've reduced the twin tunnel option for the same reasons assuming if HS2 agree that the open-face tunnel-boring machine which is cheaper could be used for the two shorter tunnels. Then obviously their scheme also reduces in cost.

251. MR BOOTH QC: Now onto the second row there there's no entry for the proposed scheme. There's only an entry for the single tunnel. That £14.7 million as against all disposal from a single-tunnel scheme, what is that figure intended to represent?

252. MR HINDLE: That intends to represent the surplus material identified by HS2 at about 680,000 cubic metres of solid material coming out of the tunnel being disposed of to landfill. Obviously the tunnels would generate a lot more than that but we assume that HS2 have other ideas to use the other two-thirds of the spoil that is not designated as superfluous. The £14.7 million then is a calculation based on industry accepted standards for transporting spoil for disposal a distance of seven kilometres. It also includes landfill tax that will go alongside that. Although if that spoil is reused or used elsewhere there will be a landfill tax credit. Anyway, we've gone on the conservative side there with £14.7 and it assumes that all of that surplus material will be disposed of locally. I think that's been adequately identified by the previous speaker.

253. MR BOOTH QC: Now onto the row 3, that shows discounts applied by HS2 for revised extension to Whitmore tunnel, just to paraphrase there. I think the Committee has already received the notes from HS2. They're pulling the southern portal south and they say there's a £12.8 million saving to them. Now of course we were already proposing to have our southern portal there. Why have you put a saving in our single-tunnel scheme in circumstances where that was already part of your plan?

254. MR HINDLE: Simply because before HS2 told us the other day that they were proposing to move the southern portal south of the twin-tunnel scheme and save £12.8

million we hadn't counted it in our savings. Simply because we were just looking at the saving in the earthworks on the civil engineering between the then existing portals, particularly in the Lee Valley. So now we know what the figure is on the saving by taking it south of the main road then we can say it balances the saving that we'd have for the single-tunnel scheme. It's as simple as that.

255. MR BOOTH QC: Okay and then the last figure that I really need to have you explain to the Committee because I think everything else flows through down the table. The last line is the fourth, civil engineering. Now if one looks, and it doesn't need to be pulled up but slide P34(2) the equivalent line in the HS2 table states civil engineering excluding earthworks. On an excluding earthworks basis the figure is £144 million. We have included earthworks and if you include earthworks you have raised the figure to £208 million. Can you confirm the basis on which you've done that and explain to the Committee why it is that those earthworks come in at that cost?

256. MR HINDLE: Yes. You've seen that the earthworks in the Lee Valley are very extensive. There are some very large cuttings and some very large embankments. The cuttings and embankment material may well be excavated and constructed in rock not soft ground. So this material has to be excavated. There are published rates available for, mainly for highway work but it applies equally to this work, for excavating cuttings in rock, in soft rock and transporting it very locally and then depositing it, compacting it and forming embankments. Other costs that are involved in that, in the overall price, would be any slope stabilisation measures that are required in the cuttings, any drainage to the cutting sides on the embankments, the foundations of the embankment and the compaction and the stabilisation of the embankment.

257. So our contention is that the earthworks that were indicated by HS2 which were actually placed underneath the line there as earthworks reduction against the proposed scheme, which is not used any more. That figure is underestimated by HS2 by quite a large factor. We're only going by current industry figures that are readily available. I have had those figures checked and verified and they seem to be, if anything, a little on the conservative side.

258. MR BOOTH QC: The last point, just to confirm, as regards contingency and I raise that because I think the Committee touched on contingency last week or indeed

earlier in the process. Have we applied the same contingency measure as HS2 in their table or have you taken a different approach?

259. MR HINDLE: Not at all, it's exactly the same application of the 40% contingency. As with HS2 the contingency is placed on the difference in cost not the total cost. It's on the difference in cost. It's done in exactly the same way using exactly the same spread sheet. That results in the final cost at the bottom, the total cost difference, which is around about £60 million.

260. MR BOOTH QC: So that figure of £60 million compares as to certainly on its existing slide at P34(2) the HS2 cost differential of £176 million?

261. MR HINDLE: That's right. Tunnels are often thought of as being very expensive beasts and indeed they are. This is because most tunnels that are built in this country are built in urban environments like Crossrail. These types of tunnels are exceedingly expensive. Tideway is another one. Here we're going to be constructing a tunnel completely in a green field, in inverted commas, setting. Risks are much lower. The ground conditions are much better and the tunnelling methodology can be much simpler. So we can be looking at tunnelling costs, which are very comparable to what you see on the continent and elsewhere in the world in these very open environments. Really, perhaps that cost can be adjusted. These are not final figures by any means. They are very broad brush figures. I admit that.

262. What's needed now is a very detailed bottom up costing of both of these methods to tease out the contingency, particularly the risk. The risk for building this tunnel I would contend would be less than it would be for constructing the railway in the open on the surface. Why is that? There are far less interfaces. We're only using one or two methods of construction whereas if you are building the railway on the surface you've got innumerable methods of construction all going on at once. So you have these multiple interfaces. These all present risk. Not only risk to the contract but risk to the environment and so on.

263. THE CHAIR: Sandy has a question.

264. MR HINDLE: Certainly.

265. MR MARTIN: Yes, Mr Hindle, comparing the two charts on the costs, I must admit I'm not particularly comfortable with the way the HS2 chart is set out. But they make it clear that in their estimation there is roughly a £9 million difference in the earthworks costs between the single tunnel and the proposed two-tunnel scheme. So the single tunnel would actually save £9 million on the earthworks. On your chart comparing the costs with what you've allocated for earthworks for the two-tunnel proposal as opposed to the single tunnel, there seems to be a £60 million difference.

266. MR HINDLE: That's correct.

267. MR MARTIN: That is a massive difference between £9 million and £60 million. Where do you think that difference has come from and do you not think that there might be some earthworks involved in the single tunnel proposal which you haven't noticed or accounted for?

268. MR HINDLE: There will be earthworks involved in the single tunnel proposal but they will be the same earthworks as in the existing scheme at the portal areas. So they're like for like. They're no different. The earthworks that we're considering are the major earthworks within the Lee Valley. I think even as a layman just looking at that, there are these very, very large cuttings going into the portals. There are these very large embankments, 21 metres high. There are also earthworks associated with the roads that cross the alignment at various locations. Does it seem reasonable that that will only cost £8 million? Certainly if you just look at the basic figures from industry standards that everybody uses, the figure of £50 per cubic metre pops up always. Particularly if you're excavating in rock. We're excavating in solid rock. We're transporting that and we are depositing it. We have to compact that. We have to stabilise that and form the embankment. I don't think you get very much for £8 million.

269. MR MARTIN: So in your view the £8.82 million difference is just plain wrong?

270. MR HINDLE: I believe it needs to be revisited. I may have missed something. I'm not perfect but it looks wrong. It certainly looks wrong.

271. MR BOOTH QC: Well, sir, unless the Committee have any further questions that was what Mr Hindle was intending to say to the Committee. I don't know if Mr Mould has some questions but if there were nothing else from the Committee?

272. THE CHAIR: I don't think there's anything else from the Committee. Mr Mould, any questions from this witness?

273. MR MOULD QC (DfT): About three points I'd just like to flag up because I'll get Mr Smart to explain the point that Mr Martin has raised and one or two other matters. Just as a way in, Mr Hindle, the top line on the screen in front of us, we know that your figures both for the twin-tunnel scheme, i.e. the Bill scheme, and the single-tunnel scheme. Those figures are in each case lower than the corresponding figures in HS2's costs aren't they?

274. MR HINDLE: That's correct, yes.

275. MR MOULD QC (DfT): £170 in place of £182 for the twin-tunnel scheme, £340 in place of £369 for the single-tunnel scheme. You describe the crux of the difference between you on construction assumptions I think as being the selection of machine.

276. MR HINDLE: It's one of the main assumptions.

277. MR MOULD QC (DfT): Yes and that accounts for a significant part of the reduction in costs that you're showing on this line, isn't it, as compared to the HS2 costings?

278. MR HINDLE: Correct.

279. MR MOULD QC (DfT): Yes. Can we just pick up on a point on that by reference to the geology, A25(6) please? We'll come back to this schedule in a moment. On your very helpful geological log section, can I just point you out to a notation if I can right in the middle of the upper.

280. MR HINDLE: Yes, that's the ground water table.

281. MR MOULD QC (DfT): That shows the water table doesn't it?

282. MR HINDLE: That's correct.

283. MR MOULD QC (DfT): Yes. We can see that a central section of the single tunnel would need to be bored below the water table?

284. MR HINDLE: That's correct.

285. MR MOULD QC (DfT): Yes. Whereas we can see that if one imagines the twin tunnels, they're going to be located much higher in the ground, respectively under the high ground here at Whitmore Heath and the high ground at Madeley. There the tunnels are going to be bored above the water table aren't they?

286. MR HINDLE: That's absolutely correct.

287. MR MOULD QC (DfT): Yes. And the key risk with using an open-face tunnel machine is the risk of water ingress isn't it? It can't cope with encountering substantial quantities of ground water during the tunnel bore.

288. MR HINDLE: If that were the case in the sandstone I'd be concerned but the Warwickshire group, the mudstone, siltstones and very thin sandstones actually and conglomerates are very much less permeable. There will be water. We can't avoid that. We are under the water table but there will be very little of it. What there is, and if it's a problem there are techniques available such as dewatering where we could lower the ground water table a little bit so that the water inflow to the tunnel is acceptable. The cost of doing that, we've already got the shafts there so we can do quite a lot of it from the shafts. In fact, the shafts will drain the formation anyway. But the cost of the dewatering will be very minor compared to the cost of the expensive machines. If you look at my programme in detail you'll see that I've accounted for any dewatering in the programme. I am anticipating it.

289. MR MOULD QC (DfT): Have you accounted for it in your costs?

290. MR HINDLE: Yes, I have. Yes.

291. MR MOULD QC (DfT): What cost have you on that?

292. MR HINDLE: It's only a couple of million.

293. MR MOULD QC (DfT): A couple of million?

294. MR HINDLE: Yes.

295. MR MOULD QC (DfT): But it also – we're here planning. We're trying to explore the comparative costs of on the one hand a twin-tunnel scheme and on the other hand a single-tunnel scheme on the basis of a conservative, a prudent approach, to the

risks associated with those two propositions on the basis of what we presently know, aren't we?

296. MR HINDLE: Yes.

297. MR MOULD QC (DfT): Yes. And it's fair to say from the factors that I put to you and where the water table is located in the ground that on the face of it the twin-tunnel scheme presents a significantly less risky proposition for an open-face tunnel bore than does the single-tunnel scheme. Because the former is above the water table and the latter is below the water table. Is that a fair point?

298. MR HINDLE: It's not unfair.

299. MR MOULD QC (DfT): Thank you.

300. MR HINDLE: Can I just explain a little? For the twin-tunnel scheme there will be virtually no risk of water ingress in those two tunnels. The risk of water ingress into the single-tunnel scheme causing a problem will be small.

301. MR MOULD QC (DfT): Right, thank you. And we can go back to your costs now just to complete my final couple of questions. You have shown spoil disposal on the second line as a separate line from tunnelling costs as a whole. You understand don't you that HS2 have included that costs within their overall cost of tunnelling?

302. MR HINDLE: The spoil disposal from the single-tunnel scheme?

303. MR MOULD QC (DfT): Yes.

304. MR HINDLE: This is the surplus spoil.

305. MR MOULD QC (DfT): I know and HS2 have accounted for the cost of disposal to an assumed disposal point up to 20 kilometres.

306. MR HINDLE: Twenty kilometres, we've identified a location within seven kilometres.

307. MR MOULD QC (DfT): Yes.

308. MR HINDLE: The cost does go up drastically.

309. MR MOULD QC (DfT): My only question, if you don't know the answer I'll ask Mr Smart to deal with it. I'm just asking, was your understanding of our cost of tunnelling, that is the top line on HS2's cost schedule that in each case the tunnel costs included an allowance for the cost of disposal of the excavated material?

310. MR HINDLE: I'll be honest and say no.

311. MR MOULD QC (DfT): All right.

312. MR BOOTH QC: Always good to be honest.

313. MR MOULD QC (DfT): I can deal with that.

314. MR WIGGIN: I would say it was essential.

315. MR BOOTH QC: Yes.

316. MR MARTIN: Chair, if I may, I'm not quite clear why that makes any difference? I mean what has happened in Mr Hindle's assessment is he's got two figures but actually the fact that he's got two figures rather than one doesn't alter the line where it says 'subtotal construction indirect costs'. It is still the same subtotal as it would have been if they'd been kept together.

317. MR MOULD QC (DfT): I'm just trying to isolate out where the true difference is. I'll move on to the next point. You've added into this schedule since you've received some information about the southern extension to the Whitmore tunnel. You've added in an allowance on both sides of the line for that element, yes?

318. MR HINDLE: Yes.

319. MR MOULD QC (DfT): You're clearly right to do that insofar as the twin-tunnel scheme is concerned because that is a significant change to the design of the twin-tunnel scheme. The twin-tunnel scheme in the Bill does not include the southern extension and therefore one needs to allow the saving that would come from including it in the twin-tunnel scheme. Do you see? That's what you've done.

320. MR HINDLE: No. No, I don't think so.

321. MR MARTIN: No.

322. MR MOULD QC (DfT): Well what have you done?
323. MR HINDLE: Well, originally the single-tunnel scheme...
324. MR MOULD QC (DfT): No, the twin-tunnel scheme.
325. MR HINDLE: Okay. Originally the twin-tunnel scheme did not cross the main road, the report, which therefore when we did a comparison of costs we only simply compared portal to portal ignoring the fact that the single-tunnel scheme did have this benefit in it. We ignored that simply because we didn't have the detail on how to cost that. Since HS2 have recognised this advantage that was already inherent in the single-tunnel scheme they've changed their scheme and assigned a saving. That saving was in the single-tunnel scheme.
326. MR MOULD QC (DfT): Exactly.
327. MR HINDLE: But it was not actually costed.
328. MR MOULD QC (DfT): But why have you made a saving for an element of the single-tunnel scheme that was already inherent in the number that is shown on the top line?
329. MR HINDLE: Because we haven't made that saving anywhere else in the calculations. We were only made aware of that saving a couple of days ago.
330. MR MOULD QC (DfT): Well, I won't take this any further. Our position is it's double counted there and I'll ask Mr Smart just to explain to the Committee.
331. THE CHAIR: That would be helpful because at the moment I don't understand your case fully.
332. MR WIGGIN: Can I just ask Mr Mould what he thinks the total cost difference from the proposed scheme really is?
333. MR MOULD QC (DfT): The total cost difference is as set out in our schedule. I'm prepared to make an allowance for, sorry?
334. MR MARTIN: Just what the number is? I can look it up otherwise.

335. MR MOULD QC (DfT): £175 million.

336. THE CHAIR: We'll come to examine that in more detail. Can I just clarify, we're due to finish this session at five minutes to six. Mr Booth, can I just confirm that you're not calling anyone else in evidence because Lichfield District Council were due to speak on Kings Bromley viaduct. Presumably they're not speaking?

337. MR BOOTH QC: No, no, sir, we were going to recall Mr Thompson to speak on that. We're not going to recall him because the Kings Bromley viaduct issue has been resolved. All that I was proposing to do was to beg one and a half, perhaps two minutes of your time just to try and draw a couple of strands together. That was going to be job done.

338. THE CHAIR: And so equally, Newcastle-under-Lyme Borough Council weren't going to be called either?

339. MR BOOTH QC: No, no. Insofar as I and the three witnesses have made the case for the single tunnel that is on behalf of Newcastle-under-Lyme as well.

340. THE CHAIR: Right, and you're asking for one and a half minutes at the end once Mr Mould has made his case and you've examined any witnesses he's brought forward.

341. MR BOOTH QC: Yes.

342. THE CHAIR: Thank you. Mr Mould, do you have any further questions or does it make sense to come back and hear from you?

343. MR MOULD QC (DfT): Yes, Mr Martin raised the really big difference between our costs and Mr Hindle's costs which relates to the allowance for earthworks saved in the single-tunnel scheme. I'm conscious of the fact that as you see from the last exchanges this doesn't necessarily always elicit a clear explanation of the position. So what I'm going to do if it's convenient to you, I'll ask Mr Smart to deal with that when we come to present our response.

344. THE CHAIR: That's fine. In which case I think it makes sense for us to end this bit of the meeting and come back at seven o'clock.