PUBLIC SESSION

MINUTES OF ORAL EVIDENCE

taken before

HIGH SPEED RAIL COMMITTEE

On the

HIGH SPEED RAIL (LONDON – WEST MIDLANDS) BILL

Monday 1 February 2016

In Committee Room 5 (Afternoon)

PRESENT:

Mr Robert Syms (Chair)
Sir Henry Bellingham
Sir Peter Bottomley
Geoffrey Clifton-Brown
Mr Mark Hendrick

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IN ATTENDANCE

Mr James Strachan QC, Counsel, Department for Transport
Ms Jacqueline Lean, Department for Transport
Mr Robert McCracken QC, Nabarro

WITNESSES

Mr Robert Latham
Mr James Adam
Mr Tom Crane
Mr Piers Connor
Mr Kieron Gayler
Ms Jo Treweek
Mr Philip Branchflower
Ms Julie Gartside
Mr Colin Pill
Mr Jon Berry
Mr Nigel Cronin
Mr Tim Smart, International Director for High Speed Rail, CH2M Hill

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IN PUBLIC SESSION

INDEX

129. MR ADAM: Two-way traffic up Rocky Lane is impossible, sir.

130. CHAIR: Is it impossible, Mr Strachan?

131. MR STRACHAN QC (DfT): No. Obviously, we recognise Rocky Lane is a relatively narrow road, it's not ideal, it's not impossible, but of course, it's all feeding into the discussions that we're having about managing traffic down Rocky Lane, and indeed the potential to connect further along onto the A413. I can't speak for Buckinghamshire as to how those things will progress, but they are all under active consideration.

132. CHAIR: Okay. Well, no doubt your county council will...

133. MR ADAM: Well, it's as far as we can go, isn't it, sir?

134. CHAIR: It is. Thank you very much, thank you very much both of you for coming today. We now move onto 1591 HS2 Action Alliance Limited.

HS2 Action Alliance Limited

135. MR MCCRACKEN QC: Good afternoon, sir. I'm Robert McCracken, Queen's Counsel, and I'm instructed by Nabarro. You have, I hope, not only slides, but also a bundle of printed material which sets out both the printout of the slides and some summary documents from our expert, who are, all of them, technical experts in the field on which they are going to give evidence.

136. The matters that the Committee has been considering over the last, I think, 18 months, are substantial and it's become apparent, I think, and I'm sure it is apparent to the Committee that many of the points that petitioners are making, are broadly similar points, and indeed, some of the points that our experts make will be putting in technical language, points that have been made by other lay people.

137. Inevitably, in view of the shortage of time that the Committee has, much will have to be left to the written material that we presented, and today, I intend to focus orally on four principle points, although briefly, I'll be presenting all our witnesses to you. But the four principle points that I'm going to focus on orally, are first of all, the need for an independent adjudicator to deal with the many matters that are not yet determined, and

also to ensure that those matters in respect of which details have already been determined, actually occur in practice in the way that we've been told that they will do. And we have a draft of amendments that we invite the Committee to recommend to the full House.

138. The second point that we intend to focus on orally this afternoon, is the value of reducing the speed from 360kmph to 300kmph. It's obviously still a high speed train. It would use a lot less energy. The full costs of journeys would be a lot less and the reduction in time would be very small, probably no greater than the time it takes to walk from the ticket off at St Pancras, back through the shops and up the escalators, if you're going to get on the East Midlands line at the moment. So, a relatively trivial saving of time.

139. SIR PETER BOTTOMLEY: How long is that time?

140. MR MCCRACKEN QC: The time saving I think, is three and a half, or four minutes, are the various estimates that have been given. I think three and a half minutes is the estimate that we take.

141. SIR PETER BOTTOMLEY: And what percentage is that of the estimated time to Birmingham?

142. MR MCCRACKEN QC: I'll ask one of our witnesses to give you that but it's a trivial saving of time, but the saving...

143. SIR PETER BOTTOMLEY: Whether it's trivial or not is a matter for each person to have their view on. It's a saving of time; whether it's a sufficient saving of time is the issue you're going to put to us.

144. MR MCCRACKEN QC: Absolutely, and I'm – I mean, that's my submission that it's a trivial saving of time. That's my submission.

145. MR HENDRICK: It's a sixth, it's roughly a sixth.

146. MR MCCRACKEN QC: Yeah. If you then think about the reduction in noise, it would be a quarter of the noise energy, as it were, and the reduction in loudness would be one third. So, it's a very substantial saving...

147. SIR PETER BOTTOMLEY: We'll get that in detail, your first point was the independent adjudicator, the second was the speed –?

148. MR MCCRACKEN QC: The third point is noise and fourth point is air quality. And then there are various other witnesses that I intend to present briefly, but those are the four principle points that we'll focus on orally.

149. CHAIR: You have 90 slides, so I presume you're not going to go through all of the individually?

150. MR MCCRACKEN QC: We're not going to all the slides; we'll go through some of the slides, but this...

151. SIR PETER BOTTOMLEY: Can you also remind us who the petitioners are? Is it mainly people in Bucks? I know it's route-wide your concerns. But this is HS2 AA, Bucks is what I saw on the petition.

152. MR MCCRACKEN QC: May I come back to you on that Sir Peter because I can't give you an immediate answer as to where the majority are and I think it's an important question, or you wouldn't have raised it, but it deserves a properly considered answer. And it may need to be an answer in writing.

153. MR HENDRICK: Well, as a percentage of the petitioners, have you got a rough idea?

154. MR CRANE: Sir, in terms of HS2 AA membership, most of the members are in the Lichfield, Staffordshire constituency, it's north Warwickshire, those will be the core areas, Buckinghamshire as well. I mean there's a large number of people in Central London, Euston area. In broad terms it's similar to the number of petitioners you've seen over the last 18 months, the proportion is broadly similar to our membership.

155. MR HENDRICK: And the petitioners who are asking for a reduction in the speed, is that unanimous or is it just a majority of them or what?

156. MR CRANE: What we've done is an extensive engagement process with our registered supporters; we've taken soundings in terms of the kind of points which we are putting forward to you, understanding we've got a limited amount of time; and what would make the most practical difference.

157. CHAIR: Okay.

158. MR MCCRACKEN QC: We have prepared three draft amendments and I would ask that those be circulated; they are in hard copy because I am conscious that it little helps you to have broad generalities. You need to have some draft amendments to look at, and the three draft amendments relate, first of all, to limitation on speed; secondly to the obligation to plant trees, which I suppose is a fifth main point this afternoon; and finally, the independent adjudicator. It may be helpful, once that's been circulated –

159. CHAIR: Carry on talking? Save time.

160. MR MCCRACKEN QC: Yes, I appreciate that. It may be helpful if I just highlight one or two features of the wordings that we're putting forward. First of all, as far as the speed limitation is concerned, we are suggesting that there should be, within the Act in due course, there should be a prohibition on taking trains above 300km/h, and then we've got various means of achieving that in the sub-clauses that we've set out in our draft clause.

161. SIR PETER BOTTOMLEY: When was the last time there's a railway Bill that had a speed limit?

162. MR MCCRACKEN QC: I don't know, sir. But I think this is the first time that we've been looking at HS2 and it's a pretty unusual project, both for good; and for those who think it for ill.

163. SIR PETER BOTTOMLEY: If any of the people involved in the Alliance know a time when a speed limit has been put in a railways Bill, I'd be grateful to know.

164. MR MCCRACKEN QC: Certainly if we do; but I would suggest that the fact that it hasn't been done previously doesn't, with respect, begin to be a reason why it shouldn't be done now.

165. MR HENDRICK: Do you accept that the aim of a high speed rail project should be to maximise the speed?

166. MR MCCRACKEN QC: No, I wouldn't accept that, and I would refer you to the Environmental Statement, to the petitioner's response document, which accepts that

300km/h would be a high speed train. So if I can take you to the petitioner's response document, it actually accepts that this would be a high-speed train. I think that's as important, in the light of the point that's put to me by Mr Hendrick, that I direct your attention to, that provision. I am also reminded that high speed trains in Germany, France and other countries travel at 300km/h. I would say that, actually, as it was to pick up on Sir Peter's formulation, where do the promoters identify precedents for high speed trains that are going not at 300km/h but at 360km/h. The Chinese, for example have reduced the speed of theirs from the original speed to that lower speed.

167. MR HENDRICK: Temporarily.

168. MR MCCRACKEN QC: No, but if this Committee is to prove a tiger with teeth and a watchdog that does actually bark when there's a problem, then it is going to need to include –

169. MR HENDRICK: One of the criticisms of many petitioners is that, even at the speed that is being proposed, it doesn't make enough of a difference on certain journeys, to justify the expense of this project. If they reduce the speed even more, that argument would be strengthened.

170. MR MCCRACKEN QC: No, that argument would simply not be affected either way; the reason why the speed makes no difference is no affected by the speed –

171. MR HENDRICK: By definition it is –

172. MR MCCRACKEN QC: With respect, no. If the time saving is insignificant, then it will remain insignificant whether –

173. MR HENDRICK: There are degrees of insignificance.

174. MR MCCRACKEN QC: Well, you are, sir, entitled to take the view that there are degrees of insignificance. I would respectfully suggest that if the time saving is insignificant, it's insignificant, regardless of whether –

175. MR HENDRICK: It's not like being pregnant.

176. MR MCCRACKEN QC: Well the difference –

177. SIR PETER BOTTOMLEY: I wouldn't bother. Just carry on.

178. MR MCCRACKEN QC: Fair enough, alright. Well, if I can then return to the document that I was looking at which is the draft speed limitation clause, we then have the draft clause, imposing an obligation to plant the two million trees. Because much has been made by the promoters of the two million trees, but as with so much, there's no firm commitment that is enforceable to achieve that.

179. SIR PETER BOTTOMLEY: Is there a precedent in a railway Bill or even a road Bill to specify how many trees are planted?

180. MR MCCRACKEN QC: Sir Peter, I'm not aware that there is, but I suppose one of your predecessors in the 19th Century might have said, when the first railway Bill was presented to the House, is there a precedent for a railway Bill, and the answer would've been, 'No, there is no precedent for a railway Bill'. A good idea is a good idea, regardless of whether it's the first time that it's done.

181. SIR PETER BOTTOMLEY: In that case, a competent lawyer – which is the only adjective I use – persuaded the Committee of MPs it was physically impossible for an engine on a wagon to pull other wagons with freight, and they were only given permission to build the railway on the condition the engines were on the side of the track and it was pulled by ropes and pulleys. So the lawyer did too well, and he got his physics wrong.

182. MR MCCRACKEN QC: Yes, and it may indicate that Members of the House should have a degree, I suppose, of humility, about matters, and should be very willing to listen to outsiders as well as promoters on all these matters.

183. MR HENDRICK: Well, that's why we're here.

184. MR MCCRACKEN QC: Then we turn to the matter that I think probably calls for most exposition from me; the proposed wording of the independent adjudicator. I emphasise – you've heard all sorts of references to Environmental Minimum Requirements, standards in the Environmental Statement, Information Paper, Code of Construction Practice and so on, many of them in draft. For example, the Code of Construction Practice, the Environmental Minimum Requirements, are in a November

2013 draft so far as the public are concerned. There is enormous amount that is going to depend upon what happens in practice and, as one can readily appreciate in so many situations, the devil is often in the detail.

185. SIR PETER BOTTOMLEY: The adjudicator is not more than 17 and not fewer than eight people?

186. MR MCCRACKEN QC: Yes, we are suggesting – we set out a schedule which sets out the, as it were, constitution of the adjudicator; and the functions of the adjudicator would be, on the one hand, to ensure compliance with requirements; to monitor and inspect and to make reports. But the critical provisions, and this is where what we're suggesting would be very important, not only to those affected who are petitioning through me, but also to many other people, including for example, Mr Latham's clients in and around Euston. The section, clause 6 as we propose it, requires the adjudicator to keep under review compliance by HS2, any nominated undertaker, and their contractors, with standards, measures and other obligations, set out in the Environmental Statement, Environmental Minimum Requirements, including all the annexes thereto, such as the Code of Construction Practice, and the undertakings provided to the Select Committee, or derived from the aforementioned documents. I would add, we need to insert in there, HS2 Information papers between Environmental Statement and EMR.

187. That's the starting point; that's, as it were, its broad remit. Then its enforcement powers are set out in clause 7. If it appears to the adjudicator that any person has failed or is likely to fail to comply with those obligations for which he is responsible, then the adjudicator may – and I emphasise this is a discretion – may address to that person an enforcement notice. An enforcement notice comes into effect 36 hours after it's published on the website, and an electronic version must also be transmitted to any nominated undertaker or contractor or local authority who have supplied the adjudicator with an email address. An enforcement notice must also be placed on a hard copy register. So it's made generally public.

188. Then, and this is a key point, the notice specifies the matters which are a breach of the obligations –

189. SIR PETER BOTTOMLEY: Is there a typo in the first line of sub-section 10, to

this clause?

190. MR MCCRACKEN QC: It is possible, but it –

191. SIR PETER BOTTOMLEY: It should be, 'A defence to any criminal proceedings…'

192. MR MCCRACKEN QC: Yes there is, there's a double 'to any'. You are much ahead of me, Sir Peter. If I can just return to 5; 5 is the notice should specify the matters that constitute a failure, prohibit the recurrence or occurrence of those matters, and require the person doing this address to carry out any specified works and to take any steps which the adjudicator thinks are necessary to achieve compliance.

193. Now, then there comes a very important provision. 'Where a notice has been served and somebody suffers loss or damage as a result of those matters, he can recover in the civil courts damages for that loss or damage'.

194. SIR PETER BOTTOMLEY: Can't they do that anyway?

195. MR MCCRACKEN QC: No, I don't think so because there would be, very often, there would be statutory authority, there would be many reasons why there would be difficulties even insofar as statutory authority didn't prohibit nuisance claims; there would be many reasons why it would be difficult for somebody to succeed. But they are a provision to protect the undertakers and operators, by providing a defence which is set out in section 7, i.e. there has been no non-compliance, because the matters that are alleged haven't occurred, or because they don't constitute non-compliance; or that the person on whom the notice was served was not responsible. Before Sir Peter points it out, there's a spelling mistake in the penultimate word of the penultimate line; it's 'person' rather than 'perosn'.

196. SIR PETER BOTTOMLEY: I wasn't going to deal with that, but I was going to ask you about sub-section 9, one fine cannot exceed £20,000, and a conviction or indictment, to a fine – presumably it means without limits?

197. MR MCCRACKEN QC: Yes, that's the standard words, for example, from the Environmental Protection Act. So it's also a crime not to comply with the requirements in an enforcement notice; and there, in addition to the defences that would apply in a

civil claim, there would also be the defences that were set out previously; and in addition, that despite due diligence, he was unaware of the provisions of the notice – that's (d) – which shouldn't actually be –

198. SIR PETER BOTTOMLEY: Well, the detail we may not need to get to.

199. MR MCCRACKEN QC: Indeed, and I apologise for being perhaps rather tiresome about the detail, but I'm conscious that we're asking for something which would be an important provision to probably all the people who provisioned about the effects upon their homes and so on; and that you are naturally very wary of those who come along and ask for something in broad, general terms. We are suggesting something that we've sought to draft in a way that would work.

200. Those are the amendments that we are suggesting there. If I can indicate one of the reasons why it's so important for us to have that; if we take the petitioner's response document in relation to our suggestion of an independent adjudicator, it's in the – it's at page 17 of the PRD for our objection? You will notice, under paragraph 8 of the response, that the promoter says, 'Under the draft Code of Construction Practice, local environment management plans are to be produced in parallel with the Parliamentary process… They will set out how the nominated undertaker will adapt and deliver the required environmental community protection measures'. But then you'll notice in the pre-penultimate line, 'Details of the engagement process will be discussed with local authorities at the appropriate time.' So we don't even know the basis upon which these local environmental management plans will be prepared, let alone what their content will be.

201. If we look at paragraph 10, and here we have perhaps echoes of what Mr Latham was talking about this afternoon. 'Undertakings and assurances will be recorded in the Official Register. The Register itself will be a list of commitments and to whom. It will not necessarily give details of each undertaking or assurance and in some cases, may simply refer to other documents, such as signed undertakings between the promoter and the third party concerned'. So there we have simply a sign post on the way that says, 'Footpath' or 'Undertaking' doesn't tell us where the undertaking goes to.

202. SIR PETER BOTTOMLEY: I read that as a commitment.

203. MR MCCRACKEN QC: Well, it may be a commitment, but we're not told what the –

204. SIR PETER BOTTOMLEY: Isn't a signed undertaking a commitment?

205. MR MCCRACKEN QC: Well yes, but people aren't going to be told what they are; they are simply going to be told in the Register –

206. SIR PETER BOTTOMLEY: If there's a signed undertaking between the promoter and the third party concerned, the third party concerned presumably knows what the signed undertaking is.

207. MR MCCRACKEN QC: Yes, but it doesn't follow from the fact there's an undertaking to one person that other people aren't affected by that, Sir Peter.

208. MR HENDRICK: If you're going to put a pathway in and you give an undertaking to anybody, it applies to everybody that that path will go in, surely?

209. MR MCCRACKEN QC: Well, no. The point is, I agree with you, that if you give an undertaking to put a path in to Mr Smith, then Mr Jones is just as much entitled to be aggrieved if you don't put that path in. But the method that's proposed here is – and Sir Peter's point was that an undertaking to Mr Smith is just an undertaking to Mr Smith; it's not an undertaking to Mr Jones.

210. SIR PETER BOTTOMLEY: My point is, it is known to Mr Smith.

211. MR MCCRACKEN QC: Yes, it's known to Mr Smith, but if Mr Jones wanted to find out about it, or Mr Smith's wife or daughter; or Mr Smith's successors in title want to find out about it, they can't do that by just looking at the Register. But can I move on? I mean, that is my answer; it seems to me that Mr Hendrick's point is a good point. But be that as it may: 'The Register should be read in conjunction with other documents that are part of the draft Environmental Minimum Requirements', namely the draft Code of Construction Practice, the draft Environmental Memorandum, the draft Planning Memorandum, the draft Heritage Memorandum. The entries on the Register will not therefore be definitive in themselves.' So much yet to be determined, and the protection which this Committee has been so honourably given to little people will no longer be there. You won't be there to protect little people.

212. SIR PETER BOTTOMLEY: I think if you're going to have witnesses on whether we should have an adjudicator or not, the sooner we get to them the better. Is this a preview or is this the main argument for the adjudicator?

213. MR MCCRACKEN QC: This is the main argument for the adjudicator; and the Register suggests that it's worth considering this very carefully.

214. Then you look at paragraph 12. 'Undertakings and assurances are binding on the nominated undertaker or the Secretary of State. The way in which undertakings and assurances depends on the classification. In relation to undertakings, any commitments given to Parliament would be enforced through recourse to Parliament.' One has to ask, how? What does it envisage that one complains to one's MP?

215. SIR PETER BOTTOMLEY: We had that last week.

216. MR MCCRACKEN QC: And what was the answer?

217. SIR PETER BOTTOMLEY: The answer is, it ends up with the Speaker, we're told.

218. MR MCCRACKEN QC: Well, that's a ludicrous answer –

219. MR HENDRICK: The Speaker's at the end of a very long chain though isn't it?

220. MR MCCRACKEN QC: He's got enormous burdens; it's impossible.

221. MR HENDRICK: In practice it would never go that far, but theoretically it could; that's the point.

222. MR MCCRACKEN QC: Well, with respect.

223. MR HENDRICK: It would go to the Secretary of State before it would go to the Speaker.

224. MR MCCRACKEN QC: Well, no, that wouldn't be satisfactory. It's said here in relation to undertakings, commitments would be enforced through recourse to Parliament, not the Secretary of State. But whether one is thinking about the Secretary of State or the Speaker, the independent adjudicator would take the burden off either of those people and provide reassurance. If I can just interject, it's not only a matter of

ensuring that these commitments are honoured; it's also giving people reassurance. That reduces the stress that they experience; and it also increases the acceptance of the project. We don't want to go back to what happened when, for example, the M3 was being built and there were constant demonstrations and acts of civil disobedience. Where there is no confidence in the process that has led to a major project, and it's going to cause adverse effects both local and in general, that can well lead to – and does lead to civil disobedience.

225. MR HENDRICK: You mention the reduction of speed in China. Do you think this level of consultation went on in China to get this reduction in speed?

226. MR MCCRACKEN QC: Are you suggesting, Mr Hendrick, that we should use China as a good precedent –

227. SIR PETER BOTTOMLEY: I will answer for him and the answer is no.

228. MR MCCRACKEN QC: I would suggest that your colleagues will not agree with you on that.

229. MR HENDRICK: Not at all, but it just highlights the differences in the way that you've been selective with particular arguments.

230. SIR PETER BOTTOMLEY: I think it would help the Committee if you would let me just read out the second part of the first bullet point at 12. 'Multilateral commitments have the effect of legally binding contracts, and would therefore be enforceable through the courts', we are told.

231. MR MCCRACKEN QC: Well, I have to say I would like to see the decisions of the courts that uphold that principle. I think I would call upon my learned friend to present the precedents that indicate that it would be courts – the High Court of Parliament that one would go to in respect of those undertakings.

232. I then notice that assurances are unilateral commitment, and that enforcement is through the Secretary of State, who will be answerable to Parliament for securing compliance. It's such a hopelessly indirect method of enforcement. The independent adjudicator is an elegant, straightforward method which provides an effective –

233. SIR PETER BOTTOMLEY: You go to one of the Officers appointed by the Chief Officer, who presumably is overseen by between 8 and 17 people who will then say you can go to court, who can then on indictment…

234. MR MCCRACKEN QC: No, with respect. First of all, this is a board rather like the Health and Safety Executive or the Environment Agency or Natural England. It's a very common practice in this country, to have those boards. That doesn't stop them from being effective – or the Office of Rail and Road Regulating. They have boards and they have chief officers who are able to be effective. The enforcement notice, one hopes, would be generally speaking, sufficient to lead to compliance. But where it isn't, there are two mechanisms for enforcement of the enforcement notice. One is prosecution and the other is civil action. Indeed, there's a third one, actually, which is the effect of public opinion and the ability of Members of Parliament to add to all of those.

235. SIR PETER BOTTOMLEY: Is this coming before, or after, or alongside escalation to the Chief Executive of the Department for Transport Complaints Assessor, the Member of Parliament, the Parliamentary Ombudsman?

236. MR MCCRACKEN QC: I would say it would almost certainly come before those things. It's not realistic to suggest that Parliament is going to be policing the number of hours that people are working on a particular site on a construction project. It's really not; it's simply not going to happen.

237. CHAIR: Given the way this place works, it would not surprise me if there were adjournment debates fairly regularly with the Under-Secretary of State for Transport, having to explain why assurances given by HS2 were not being complied for their constituents. So the poor old Under-Secretary of State for Transport is going to have quite a lot on his plate, I suspect, or her.

238. MR MCCRACKEN QC: He or she would have a lot on his plate, but would be protected by the Chief Whip; the great merit of having an independent adjudicator is there's somebody who is independent, who would be able to look after the interests of the little people who will no longer have recourse to this Committee.

239. MR HENDRICK: Had you considered, before you came up with this proposal, an

Ombudsman type role?

240. MR MCCRACKEN QC: Well the independent adjudicator is effectively an ombudsman, but an ombudsman with power. I mean, ombudsman is just a Nordic term for a commissioner who is responsible –

241. MR HENDRICK: As you know, Ombudsman advise and suggest; they don't have powers you're spelling out with the adjudicator?

242. MR MCCRACKEN QC: It's critical that he has powers to do things; and insofar as your question is, 'Have you considered somebody whose role is to advise and mediate?' such as the complaints commission suggested in paragraphs 14 and 15 of the promoter's response, then we've considered it, we've rejected it. It wouldn't be effective. We note, for example, that they're proposing a small claims scheme for schemes up to £7,500 for physical damage. Well, a lot of what is going to happen is going to be worth a lot more than £7,500 and isn't going to be the result of physical damage. So, we say this is a neat, elegant solution that would be effective and would give people confidence. We actually drafted something which you can put in front of you and I think it would protect the Secretary of State, the Speaker of the House, and those who work here from being endlessly bogged down – I imagine that this Committee feels it has been bogged down over the last 18 months, in a very worthwhile task, with very honourable motives and so on. But I imagine, it's beginning to feel that it's heard enough about HS2 and would quite like to move on to other matters. So, that is what, in broad terms, we say about the independent adjudicator.

243. Now, if I may, I would like to turn to the slides. If we can move to the second slide straight away? You asked, Sir Peter, who we were in a sense; the second slide says quite a bit about who we are. You can see there that we've a broad range of people.

244. Next slide please? We've set out there the response to the many points made in our petition, and the answer to all of them has been no, apart from some partial corrections of defects in the Environmental Statement.

245. SIR PETER BOTTOMLEY: Am I wrong in remembering the suggestion there would be no net loss in biodiversity?

246. MR MCCRACKEN QC: Well, we don't – that doesn't appear to be what's going to be achieved in practice, but certainly it's what should be achieved in practice.

247. SIR PETER BOTTOMLEY: I thought we'd been working for the past year or so on the basis that the aim was to have no net loss of biodiversity?

248. MR MCCRACKEN QC: Well, I'm delighted to hear that, but it's put in as an aspiration rather than as something that will actually be achieved. So perhaps, if you were to ask Ms Treweek questions about that when she comes to give her evidence.

249. SIR PETER BOTTOMLEY: I would prefer to ask the promoter because they are the ones who give the commitment.

250. MR MCCRACKEN QC: Well, indeed.

251. SIR PETER BOTTOMLEY: First looking at this, something strikes 13 – being close to the clock tower, one starts doubting some of the other 12 strikes, is my own sort of contribution to the metaphor.

252. MR CRANE: Sorry to interrupt, the commitment is to strive for no net loss; to achieve no net loss – and we've got the expert who can speak in more detail on that, if you'd like to ask questions on it. But there is not a clear, unambiguous commitment as you'd expect, for no net loss.

253. MS TREWEEK: To deliver it.

254. MR MCCRACKEN QC: An aim and an aspiration is a world apart from actually a commitment which involves an obligation to provide something. And it's also necessary of course, if you are going to say that's your aspiration, without demonstrating how you're going to do it, to let people – give people a feel for how you will do it. Because if in practice, you haven't assessed things and it seems to our expert that the baseline hasn't been properly assessed, then you're not in a position to actually make an aspiration, something that is worth having.

255. Next slide please? Now, we're asking the Committee –

256. SIR PETER BOTTOMLEY: We've read that; and we've heard on four of the five points.

257. MR MCCRACKEN QC: Yes, and we want the commitment to plant trees to be made real, and we put in a draft clause to that effect. I suppose in relation to request one, we are asking that even where there isn't time this afternoon to present material, that you consider the written material when you haven't had chance to hear it this afternoon.

258. Next slide please? These are the range of experts that we're proposing to call, and you'll see that their qualifications are considerable. These are not merely well-intentioned lay people. These are people who are expert, who are probably normally acting on behalf of the promoters of projects.

259. Next slide please? Now, here I want to pick up particularly the question put by Mr Hendrick about three and a half minutes, and remind the Committee of what the Secretary of State said in September 2013 when he said, '20 minutes off the journey to Birmingham is almost irrelevant. It's nice but it's not important. It should always have been about capacity'. I think that is really very important. I'd also like to remind the Committee of what the Environmental Audit Committee said in its report, that HS2 and the Department should examine the scope for requiring a reduced maximum speed for the trains, until electricity generation has been sufficiently decarbonised to make that a marginal issue, and publish the calculation that would underpin such a calculation.

260. SIR PETER BOTTOMLEY: Thank you for reporting that accurately; last week we had people who did it inaccurately.

261. MR MCCRACKEN QC: I'm obliged, sir. And, I think I would just add to that, of course, until we have totally decarbonised our electricity generation, any electricity use that we can avoid will effectively be increasing the marginal amount of non-decarbonised electricity generation that we have to produce.

262. SIR PETER BOTTOMLEY: That's nearly correct; but the difference doesn't matter too much –

263. MR MCCRACKEN QC: There will be, at the margins, it could be conceivably at three o'clock in the morning –

264. SIR PETER BOTTOMLEY: If, say, half of our electricity generated by burning

coal in this country or elsewhere, is substituted by no carbon or less carbon generation, what you've said doesn't necessarily logically apply; you won't have eliminated it, but it may have reduced it significantly. So if you had a train which used, say, twice as much electricity, but only used one-quarter of the amount of fossil fuels to generate it, you'd still be having an improvement.

265. MR MCCRACKEN QC: Of course you'd still be having an improvement, yes, but the point is that if you reduce the electricity consumption by 20%, you will effectively be reducing the national carbonised electricity generation –

266. SIR PETER BOTTOMLEY: Probably –

267. MR MCCRACKEN QC: I accept that it could be, at three o'clock in the morning, nuclear power stations are producing electricity too cheap to meet – and there'll be no emissions and nobody is using it. I accept that's theoretically possible, although it's somewhat unlikely because on the whole these high-speed trains won't be whizzing through the night.

268. The next slide, if we may? We emphasise that reducing the speed of HS2 will mean far better environmental outcomes than the current scheme. And the advantage is, we it the overall balance, as it were, for the Committee's deliberation, it will be cheaper, it will reduce the technical risks which the project has struggled with since outset; and there will be lower operating costs, and that means lower ticket prices, which is quite important. I hesitate to say it to a Committee that includes Members of Parliament who come from the northwest but the cost of rail fares is already horrific, and high-speed train fares are going to be even more horrific, and therefore anything that reduces the fare is a good thing for ordinary folk who have to pay for their tickets.

269. MR HENDRICK: I wouldn't pretend that the fare price is excessive, and I don't think it's necessarily linked to electricity by the amount that you'd like to suggest. But on McLoughlin's point – or the Secretary of State's point earlier, about 20 minutes not making much difference. My train today was delayed by 30 minutes, and it was the difference between me being late for this Committee and me being here on time. I think it is important.

270. MR MCCRACKEN QC: Well, delay is always important, so I readily recognise

if the train doesn't arrive when it should arrive, that is always important. But of course, here we're not talking about, as it were, un-programmed delays. What we're talking about is programmed time. But actually, in relation to delays – and you make, if I may, respectfully say sir, rather an astute and important point. Un-programmed delays are very important. They are more likely when you are running at the margins with a 360km/h train than they are when you're going comfortably at 300km/h. So in the context of programmed delays, it's better to have a more modest aspiration which is more realisable; and so I would respectfully suggest that that's a point –

271. MR HENDRICK: Well, I think the train may be obliged to have a maximum of 360km/h but I'm sure these trains technically can go faster if they wish to?

272. MR MCCRACKEN QC: Yes, they probably can. But this is one of the –

273. MR HENDRICK: When you design something like that, you don't design it to operate at the maximum; like a car, you design it to operate normally at a speed which is whatever is comfortable.

274. MR MCCRACKEN QC: Well, at any event, un-programmed delays are quite different in context from programmed delays –

275. MR HENDRICK: I accept the point, but I'm saying sometimes very fine margins are important.

276. CHAIR: Your four witnesses, you've already trailed that they're excellent witnesses, are we going to get on to –

277. MR MCCRACKEN QC: Alright, let's go straight on to a witness then if we can? Let's go on to Mr Connor, our rail expert, if we may? I will ask him to –

278. CHAIR: He will be off-camera; either budge up and move to the right; if you move one over and he goes in the middle? You might have to move your files.

279. MR MCCRACKEN QC: Is Mr Connor visible now?

280. CHAIR: Yes.

281. MR MCCRACKEN QC: Good, now you are Piers Connor, you've over 50 years'

railway experience?

282. MR CONNOR: I do.

283. MR MCCRACKEN QC: Starting I think as a driver on London Underground trains?

284. MR CONNOR: Even before that?

285. MR MCCRACKEN QC: But you have a Master of Science in railway systems engineering?

286. MR CONNOR: I do.

287. MR MCCRACKEN QC: You are a Member of the Chartered Institute of Logistics and Transport?

288. MR CONNOR: I am.

289. MR MCCRACKEN QC: And the IRO –

290. MR CONNOR: Institution of Railway Operators.

291. MR MCCRACKEN QC: Thank you. And you've worked in operations, maintenance engineering, planning, training and education. And the projects that you've been involved in, I think for operators and promoters, rather than objectors and so on, include Channel Tunnel, HS1, New York Subway, Hong Kong KCRC, London Underground, Los Angeles and Johannesburg?

292. MR CONNOR: That's correct, yes.

293. MR MCCRACKEN QC: So on slide – slide (15) thank you. Next slide please? Now, that slide shows five of the elements of a system and you make an observation about the effect on all of those of increased speeds?

294. MR CONNOR: That's correct. Because the railway is a system, the systems are all linked and if you change one of the systems or if you change the performance, then all of those different parts of the system are affected by that change. So if you are talking about the difference between, say, 360km/h and 300km/h, it will affect all of

those; it will affect the infrastructure, it will affect the rolling stock; it will reduce the need for power supply; it will affect the way the trains are controlled; and it will affect the operations.

295. MR MCCRACKEN QC: Okay, next slide please? Now talk us through these – they're rather important, they need a bit of explanation I think. So if you take us through these carefully?

296. MR CONNOR: Okay, acceleration and braking on trains – it affects cars and planes as well. They are not constant throughout the speed range. So in the case of acceleration, it's a gradually decaying curve and the decay becomes greater as you reach the top speed of the vehicle. In braking, it's very low at high speed and then as the train speed falls, the braking rate increases. These are matters of physics.

297. In respect of how we calculate for a system like a railway, looking at timetables and things like that, we use a straight line; so we take the average of the acceleration or braking, from 0 to the top speed; or from the top speed down to 0.

298. MR MCCRACKEN QC: Now I expect the Committee knows what a headway calculation is, but just in case any of them don't, can you just quickly explain that?

299. SIR PETER BOTTOMLEY: Gap between the trains.

300. MR CONNOR: Exactly, nailed it in one. It is the gap between trains; it's in official terms, it's the time elapsed between the passing of the head of one train to the passing of the head of the next.

301. MR MCCRACKEN QC: And it's critical in terms of working out the capacity of the line?

302. MR CONNOR: Exactly, it is.

303. MR MCCRACKEN QC: So pragmatically speaking, what assumptions should be made about HS2's acceleration and braking?

304. MR CONNOR: In my opinion, we should start with $0.3m/s^2$ for acceleration and $0.5ms^2$ for braking.

305. SIR PETER BOTTOMLEY: Say it again slowly?

306. MR CONNOR: It's 0.3ms^2 for acceleration and 0.5ms^2 for braking. So braking –

307. SIR PETER BOTTOMLEY: Neither of which match the figures you're showing us on the next slide?

308. MR CONNOR: That's correct.

309. MR MCCRACKEN QC: If you'll bear with us, Sir Peter, for a moment. What figures though, by contrast, have HS2 used for braking?

310. MR CONNOR: HS2 are using 0.67m/s^2.

311. MR MCCRACKEN QC: And how do you view that?

312. MR CONNOR: I think it's technically doable, but operationally ambitious.

313. SIR PETER BOTTOMLEY: Does it matter whether it's regenerative braking or it's friction braking?

314. MR CONNOR: It doesn't matter from the point of view of the performance of the braking, but it does matter from the point of view of recovery of energy and things like that. By that I mean that if you're looking at the train braking in terms of its performance, the level of braking is not dependent upon the type of braking used, provided it's reaching –

315. MR HENDRICK: But the regenerative braking does conserve more energy doesn't it?

316. MR CONNOR: The regenerative braking will allow energy to be recouped and fed back into the supply system, provided the supply system is designed to accept it.

317. MR HENDRICK: Yes. So that – to some extent, not totally, but to some extent, means that some of the energy that the trains are taking can go back into the grid.

318. MR CONNOR: Yes, it's a good thing; regenerative braking is in principle a good thing. And modern trains and Network Rail and so forth are adapting to do that kind of thing more and more across the country.

319. So the reason for HS2 using 0.67m/s^2 is because it's a standard sort of figure; and in my view, in operational terms, that figure is not realistic which is why I've selected 0.5m/s^2. The acceleration range isn't specified in their rolling stock published information, but by looking at how they've calculated certain things in some of the documentation that has been issued, it suggest that 0.14m/s^2 is what they would get between 225 and 360km/h, which is a very low rate of acceleration.

320. MR HENDRICK: Without going into too much detail, what leads you to these assertions?

321. MR CONNOR: It's simply a matter of calculation? We can calculate it from the way –

322. MR HENDRICK: We will see what HS2 say afterwards, fine.

323. MR MCCRACKEN QC: Could you supply the calculations to the Committee afterwards if that would helpful.

324. MR HENDRICK: I don't want to look at them, even though I can probably understand them. I just want to know what HS2 are going to say about them.

325. MR MCCRACKEN QC: Okay, and then you've got some examples –

326. SIR PETER BOTTOMLEY: Effectively saying, they're being - optimistic might not be the right word, but let's just say optimistic on braking and pessimistic on acceleration?

327. MR CONNOR: No, what I think I tried to do with it was use their figures to demonstrate what they were expecting their trains to do. I haven't tried to view them in terms of how they've developed figures; I'm just using the figures they published. My view is that certainly in terms of the braking, that it's ambitious –

328. SIR PETER BOTTOMLEY: It's better at 0.5m/s^2.

329. MR CONNOR: It's ambitious. In terms of the acceleration, it's what I would expect.

330. MR MCCRACKEN QC: Sir Peter, in response to your question of course, don't

forget that the 0.14m/s-2 is only between 225 and 360, so at lower speeds you'd achieve a greater rate which accounts for the 0.3m/s-2 average.

331. Then we've got train speeds there, and we see that none of the neither the German, French or Japanese go above 300km/h; and none of them have a braking which begins to approach 0.67m/s-2.

332. SIR PETER BOTTOMLEY: Are these their existing fast railways, or the ones they're proposing for the future?

333. MR CONNOR: These are existing.

334. SIR PETER BOTTOMLEY: The ones they are proposing for the future? What about the ones they're proposing for the future?

335. MR HENDRICK: The Shinkansen are actually building alongside and I've seen it with my own eyes, particularly between Tokyo and Osaka, a new generation that will be even faster than these.

336. MR CONNOR: I believe they are. And what you have to remember, gentlemen, is that train speed is not directly related to just a speed; it's related to what you want your capacity to do between the distances of the city as they are set apart. So in terms of, let's say, 400km between cities, then a speed of 360km/h might be suitable if it was a non-stop railway because you are competing with airlines. But if you look at, for example, London to Birmingham, or even Old Oak Common to Birmingham interchange, the distance there I think is 117km, which is quite –

337. MR HENDRICK: Yes, but would you accept though that if this is a new design, as it is, and the Japanese are producing faster trains on their lines, that clearly they wouldn't be limiting themselves to 300km/h, otherwise it would be pointless.

338. MR CONNOR: I don't know what their plans are in terms of how many –

339. MR HENDRICK: I don't know what the top line figure, but they will be faster than the current Shinkansen.

340. MR CONNOR: This is possible.

341. MR HENDRICK: It's a matter of fact; it's not possible. It's a matter of fact, otherwise they wouldn't get out of bed in the first place.

342. MR MCCRACKEN QC: Do you know whether the environmental standards, in terms of carbon emissions and noise impact are the same as they are in this country?

343. MR CONNOR: I've got no information about that.

344. MR MCCRACKEN QC: Are they important in terms of assessing what the acceptable maximum speed is?

345. MR CONNOR: They are important, and in fact, it's a question of making sure that the system – that is the distance between stations, the number of people you expect to travel during any particular period, the amount of energy you're consuming, the effects on the environment, the speed you choose for the particular environment you're in, all of these different factors, will determine what is the ideal choice from an efficient, economic and environmentally friendly sort of system. So there are a lot of variables.

346. MR MCCRACKEN QC: Can we move now please from Japan to China in the next slide, (19), and you there set out the actual performance in China, where the intention was to have a maximum speed of 350km/h, which has now been reduced to 300km/h. You've got a graph which shows on the Y-axis the speed in kilometres per hour that's achieved; and in the X-axis the time that's taken. To get to 300km/h, you say it's taking seven minutes. Now, we notice that that's going from 10 to 19, which looks on the surface like nine minutes. Why did you say that was seven minutes rather than nine minutes?

347. MR CONNOR: That's because if you notice at 80km/h was the time where the train actually stays at 80km/h for about three-quarters of a minute, then the speed rises to 150km/h, then stays at 150km/h for a minute; and therefore I've taken those two times out in order to give an even, a straight line curve, if you like?

348. MR MCCRACKEN QC: Because the driver chose to coast at those speeds rather than to accelerate, it would be unfair to say that it need to have taken that period of time to…?

349. MR CONNOR: Yes, a choice was made to travel at that particular speed for a

distance, we don't know why.

350. SIR PETER BOTTOMLEY: Just as a helpful reminder, when was this line planned?

351. MR CONNOR: This line, I cannot tell you exactly but it was certainly within the last 10 years.

352. MR HENDRICK: The Beijing Link is four or five years old.

353. SIR PETER BOTTOMLEY: So it would have been planned about 10 years before that?

354. MR HENDRICK: 10 or 15 years ago?

355. SIR PETER BOTTOMLEY: 10 to 15 years ago?

356. MR HENDRICK: Yes.

357. MR CONNOR: And just to go on from that, it is a similar mix in terms of both at the end of it, as a tangent, it then goes onto the national network, it serves other cities.

358. MR MCCRACKEN QC: I expect you can give us a broad indication of the comparison between the environmental standards applied in China and in this country?

359. MR CONNOR: They are certainly not the same.

360. MR MCCRACKEN QC: Does that mean higher or lower?

361. MR CONNOR: They are bound to be lower.

362. MR MCCRACKEN QC: Thank you. Now we come – next slide please? – to, as it were, the critical comparisons that we invite the Committee to note. You've got three columns; the factors, and then what they are like at 300km/h and then what they're like at 360km/h. So just take us through those if you would?

363. MR CONNOR: Okay, for each of the two speeds I put down the difference between the braking distances which is 7.5km for 300km/h and 10.5km for 360km/h. The acceleration time is seven minutes and 12 minutes respectively; to get to 360km/h,

studies show it will consume 19% more energy. And the noise levels will go from 90dBA to 97dBA. In terms of capacity, the train capacity at 300km/h is in the region of 13.5 an hour and at 360km/h, it's in the region of 10 per hour.

364. MR HENDRICK: Does the energy figure mean net energy because with the braking as we said earlier, was regenerative braking, some of the energy is going back into the grid?

365. MR CONNOR: As far as I'm aware in this particular study, they didn't take that into account.

366. MR HENDRICK: So they are just looking at energy consumed?

367. MR CONNOR: They are just looking at energy consumed.

368. MR HENDRICK: Not necessarily what comes from it?

369. SIR PETER BOTTOMLEY: 19% extra energy is during that part of the journey where you're going above the 300km/h?

370. MR CONNOR: That's correct, that's just for the extra speed.

371. MR HENDRICK: Well, what capacity of that would be going back into the grid with the braking?

372. SIR PETER BOTTOMLEY: That I additionally appreciate; and can someone give us a figure roughly what proportion of a journey to either Birmingham or Crewe or Leeds would be at the 360km/h rather than 300km/h?

373. MR CONNOR: London to Birmingham, the difference would be – assuming a stop at Old Oak Common and Interchange, it's about 5.5 minutes; I'm assuming non-stop it's 4.5 minutes.

374. SIR PETER BOTTOMLEY: So the amount of extra energy used on the whole journey, by giving up 360km/h, is not 19%; it's probably about 3%?

375. MR CONNOR: I don't follow you, sorry.

376. SIR PETER BOTTOMLEY: The extra energy needed to go at 360km/h rather

than 300km/h, only applies to that part of the journey where you're going above 300km/h?

377. MR CONNOR: That's correct.

378. SIR PETER BOTTOMLEY: If you're stopping at Old Oak Common and you're stopping at Birmingham International before you get to Birmingham; you've got two stops, you've got tunnels where you don't go at 360km/h so I'm just trying to work out what, actually, for the journey itself, having the capacity at 360km/h; and what the overall increase in energy use would be. I don't think it's 19%?

379. MR CONNOR: There are a number of graphs which have been published which show train speeds along the currently-planned route of HS2. And there are variations on that, according to various different route options.

380. MR MCCRACKEN QC: Could you present a paper to the Committee just covering those points –

381. SIR PETER BOTTOMLEY: It's not a matter of argument; it's just a matter of estimates.

382. MR CONNOR: Well, you're quite right, Sir Peter. That's the calculation.

383. MR MCCRACKEN QC: Can we then turn to the next slide now? Sorry, just before we do – trains per hour, 13.5, 10. What effect does that have on the factor which –

384. SIR PETER BOTTOMLEY: The headway is determined by the fastest speed?

385. MR CONNOR: Yes.

386. MR MCCRACKEN QC: What effect does that have on the capacity of the line, the point that the Secretary of State considered to be critical?

387. MR CONNOR: Yes. The lower the speed, the more trains you can fit because they are allowed to run closer together. It's a very simple thing. It allows you – it also gives you some leeway in terms of times of trouble, when you've got some recovery –

388. SIR PETER BOTTOMLEY: Recovery time.

389. MR MCCRACKEN QC: Now, assuming for the moment that the law of supply and demand determines prices – and I know it's a big assumption – but assuming that, for the moment, what effect is there on prices, on being able to have 13.5 trains an hour rather than 10 an hour?

390. MR CONNOR: You'd get more people on the railway so you'd get more money in?

391. SIR PETER BOTTOMLEY: If you're running at capacity?

392. MR CONNOR: If you're running at capacity.

393. MR MCCRACKEN QC: And to increase the number of people, what do you do to the prices?

394. SIR PETER BOTTOMLEY: We are grown up!

395. MR MCCRACKEN QC: Alright, very well. It's probably a submission point rather than a point to ask the witness about. So let's have the last slide if we could, (21)? So these are the overall points that you make there?

396. MR CONNOR: That's right. The international acceptance of 300km/h is the normal speed for high-speed trains in the European context. It saves energy; it provides a cost reduction for the maintenance of rolling stock and infrastructure.

397. SIR PETER BOTTOMLEY: We can read faster than you can speak. Are there any higher speed railways being planned throughout mainland Europe at the moment?

398. MR CONNOR: The French are looking at 320km/h for certain of their routes. I'm not aware of any others at the moment.

399. SIR PETER BOTTOMLEY: When I ask these questions, I'm not trying to make an argument; I'm just trying to understand.

400. MR MCCRACKEN QC: I entirely appreciate that, sir. It's extremely helpful to have questions from all members of the Committee. Mr Connor, would you wait because there may be questions from Mr Strachan?

401. MR STRACHAN QC (DfT): Well, I'm very happy to do this in any number of

ways. I think it's probably going to be simpler if I just ask Mr Smart, either on this topic or at the end, just to come back.

402. SIR PETER BOTTOMLEY: It would be helpful if you go through the petitioner's witnesses then have the promoters deal with the things together?

403. MR STRACHAN QC (DfT): Can I just flag up one thing, which relates to noise, and no doubt to be discussed later on. I think the Committee has already heard evidence that the difference between 360km/h and 300km/h is 4dB difference, which is set out in our Volume V technical appendices document. I just raise it because it notes that in this witness's evidence and indeed later on, a larger figure is given.

404. SIR PETER BOTTOMLEY: From high noise it will be a noticeable difference rather than a very noticeable difference?

405. MR STRACHAN QC (DfT): Well, it depends –

406. SIR PETER BOTTOMLEY: Are you taking 90dB as the baseline or is that being challenged as well?

407. MR STRACHAN QC (DfT): I'm not sure we've got the same figure of 90dB, but certainly the change is 4dB. I'll look up the precise maximum level. I wasn't intending to get into a debate about it now, just flagging it up as a point we've got in our documents. Other than that, I'll ask Mr Smart to cover the points you've just heard from our perspective.

408. MR MCCRACKEN QC: It's very helpful that Mr Strachan flags that up because our figure in our noise expert of 6dB comes from the promoter's material; it's not a figure that we have calculated, it comes from the promoter's material. So it's interesting that things have moved on. It's also noteworthy that 3dB is conceded by the promoter to be significant and so –

409. SIR PETER BOTTOMLEY: We get the point.

410. MR MCCRACKEN QC: Mr Connor, thank you very much, but if you don't leave for the moment in case you are needed later. I think what I propose now is to go straight on to deal with noise, I think? For noise, it's Kieron Gayler? His qualifications and so

on are set out at A20703 and 0095 so in the bundle of written material that I think you have, you're looking at either A20703 or 0095, that's where his personal introduction is and if I could just run through it. You are Kieron Gayler of Sharps Acoustics? You are a chartered scientist, a chartered environmentalist, and you hold a Bachelor of Science (Honours) degree in environmental science? You're a member of the Institution of Environmental Scientists, a Member of the Institute of Environmental Management and Assessment, and a Member of the Institute of Acoustics? And you've been consulting on acoustic matters for almost 20 years with a particular specialism in environmental noise, noise nuisance and environmental impact assessment; and you started your career at Ashford Council in Kent in 1997, and you are an environmental control officer there during the construction of the Channel Tunnel railway? And you joined Sharps Redmore as it then was in 2000; and you became a Director in 2008. In September 2015, you joined Sharps Acoustics as Partner. You've been asked to advise on and to make a presentation to this Committee on the likely noise benefits of reducing the maximum speed of HS2 trains?

411. So I would now like us to go to A2068(23) that's the first material slide? And this is information that you managed to obtain under the Freedom of Information Act?

412. MR GAYLER: I didn't but the HS2 Action Alliance obtained in, I understand.

413. MR MCCRACKEN QC: Yes, somebody did. Can you just explain what this shows?

414. MR GAYLER: Well this is effectively the whole-day level from the trains on HS2, noise level at 25 metres, and it's a curve which shows the increase in noise level with increase in speed. You can see that from 300km/h to 360km/h, the curve increases upwards at a greater rate than is the case below 300km/h.

415. MR MCCRACKEN QC: So above 300km/h, each unit of speed produces more units of noise, if I can put it that way?

416. MR GAYLER: Yes, that's correct.

417. SIR PETER BOTTOMLEY: It shows that the rate of increase of, let's say, noise, from 150km/h to 300km/h declines, but the rate from 300km/h to 350km/h is roughly

the rate between 50km/h and 100km/h?

418. MR GAYLER: There's a kink upwards from 300km/h –

419. MR MCCRACKEN QC: No, Sir Peter, I entirely accept the point you make, but in terms of the comparison between 300km/h and 360km/h, I think the way I put it works for that.

420. SIR PETER BOTTOMLEY: It's in the middle range where it doesn't increase at the same rate as it does at the earlier increase in speed, and the later increase in speed?

421. MR MCCRACKEN QC: Yes.

422. SIR PETER BOTTOMLEY: That's what the graph shows?

423. MR GAYLER: Yes.

424. SIR PETER BOTTOMLEY: Whether it should have been on a log graph, I don't know.

425. MR STRACHAN QC (DfT): It shouldn't be Leq either.

426. SIR PETER BOTTOMLEY: We know all that –

427. MR MCCRACKEN QC: Well, I think all sorts of debates can be had about Leq. But let's now move to the next slide, (24), what does that show?

428. MR GAYLER: This shows the influence of various elements of the noise from trains, rolling noise and aerodynamic noise for example. What you see, the two red dashed lines, the top one of those is rolling sound; and the lower one is body aerodynamic sound. At the higher speed, above 300km/h, the aerodynamic sound has more influence on the total noise level. That's what results in that kink upwards at 300km/h and above aerodynamic noise becomes much more influential.

429. MR MCCRACKEN QC: Thank you, so if we now turn to your slide (25), help us as to where you got these figures from and what they indicate?

430. MR GAYLER: This is a table that I derived from the chart at slide (23), the first Leq line. It just sets out in table form the difference in sound level at each speed, in

10km/h steps, and shows the reduction for each, reduction in 10km/h, reduction in sound in the right-hand column. So you can see, 340km/h, the difference is 2dB between 360km/h.

431. MR MCCRACKEN QC: Yes, and so we see that the difference between 300km/h and 360km/h is a difference of 6dB?

432. MR GAYLER: Yes, from the chart at slide (23).

433. MR MCCRACKEN QC: Yes, now a couple of points I want to ask you about that. If we reduce the number of trains per hour, that might well reduce the average hour noise level throughout the day, the Leq. But would it make any difference to the difference between going at 300km/h and going at 360km/h?

434. MR GAYLER: The number of trains per hour would make a difference to the absolute level, but not the difference between sound levels between different speeds.

435. MR MCCRACKEN QC: Do these figures take account of the reductions that are achieved by acoustic barriers? In other words, are these before or after?

436. MR GAYLER: No, these are unmitigated, so these are base levels at 25 metres from the track.

437. MR MCCRACKEN QC: Now, if as you get above 300km/h, the aerodynamic component of the noise increases, does that have an effect upon the ability of barriers to reduce the noise at the receptors with which you are concerned?

438. MR GAYLER: Yes, because the barriers are less effective against aerodynamic noise because that occurs higher above the ground; and rolling noise is obviously at track level. Aerodynamic noise is generated by the flow of air over the train body and so occurs at a higher level above the track, so screening effects can be lessened by the fact the noise source is higher.

439. MR MCCRACKEN QC: Okay. Right, now can we look at the petitioner's response document for a moment as to speed, because I think the promoter's response document about speed is dealt with at paragraphs – in paragraphs 83-91 of the petitioner – and that's page 7 under general concern, I think they deal with speed. Let's just have

a look at that? Yes, speed. It's page 10, paragraph 6 and 7. The promoter says about speed –

440. SIR PETER BOTTOMLEY: 7 is on page 11. It starts on page 6, page 10, number 6?

441. MR MCCRACKEN QC: Yes, that's right, starts on page 10, goes on to page 11, and is there any suggestion there that the difference in noise levels is 4 dB rather than 6 dB?

442. MR GAYLER: Not that I'm aware of, no.

443. MR MCCRACKEN QC: Have you seen the suggestion that the reduction in noise levels is four decibels rather than six decibels?

444. MR GAYLER: I haven't, no.

445. MR MCCRACKEN QC: No. I wonder if we could have a copy of whatever it was that suggested that the noise was 4 dB rather than 6 dB, because I'd like to get Mr Gayler to –

446. MR STRACHAN QC (DfT): Do you want to just get back to your other slide, slide 24? It's on your own slide. It's also reflected in the ES. There we go. If you look at 300 kilometres per hour it's at 90 dB. 360 is 94. It is shown elsewhere, at paragraph 1.3.8 of volume 5 of the technical appendices, that there's a 4 dB change.

447. SIR PETER BOTTOMLEY: So that was used by the petitioners in creating their graph?

448. MR STRACHAN QC (DfT): I don't think it has been because this is what's in the environmental statement –

449. SIR PETER BOTTOMLEY: This chart?

450. MR STRACHAN QC (DfT): This chart is derived from the environmental statement, which shows a 4 dB difference between travelling at 360 and 300. It's also shown on another figure in the technical appendices to the environmental statement, where that level of difference is shown. I'm not quite sure how the petitioners have

derived their figures–

451. MR HENDRICK: 4 dB or 6 dB unmitigated in either case?

452. MR STRACHAN QC (DfT): It is, unmitigated.

453. MR GAYLER: The point being, if I can answer, the chart there on slide 24, are Lmax levels, so peak – discrete peak noise levels. The chart from the freedom of information request is an 18 hour Leq or average whole day level, so they're in a different index. So HS2 provided this chart to say that the relationship between speed over the whole – speed and noise over the whole day as a whole day average is that Leq line in slide 23. The slide 24 chart is in a different index.

454. MR MCCRACKEN QC: So slide 24 is just telling you what the maximum – the difference in maximum speed is, but slide 23 is telling you what it amounts to when you allow for the fact it goes on all day.

455. MR GAYLER: As an Leq, which is – I know members have had various lessons on Leq and Lmax, but it's the whole day average level, for want of a better description.

456. MR MCCRACKEN QC: And how widespread now is Leq as an index of the actual impact of noise on people's lives?

457. MR GAYLER: It's very widely used as an index for noise assessment. Most environmental noise assessments use Leq.

458. MR MCCRACKEN QC: So the difference between you is not that you misread slide 24 but rather that slide 23 is using the Leq index, as the HS2 have done at the time that the information was produced, which – to which the response –

459. MR HENDRICK: Could Mr Strachan respond to that specific point?

460. MR STRACHAN QC (DfT): Sorry?

461. MR HENDRICK: About the use – you've used Leq or not.

462. MR STRACHAN QC (DfT): Yes. His graph is showing the Lmax difference between the one that's on screen, slide 24. I'll ask Mr Thornely-Taylor to deal with the Leq difference when he comes to give evidence.

463. MR HENDRICK: Alright. So there's no dispute as to whether it's six or four now, they're two different figures.

464. MR STRACHAN QC (DfT): I think, as I've understood the petitioner's case, they are talking about a 6 dB difference for Leq, and I will get Mr Thornely-Taylor to deal with that. I think the petitioners are accepting it's 4 dB in terms of LAmax.

465. MR MCCRACKEN QC: Well, before my witness goes I'd like to know that you accept that on Leq it's a 6 dB difference.

466. SIR PETER BOTTOMLEY: I think when we come to hear from Mr Thornely-Taylor we will hear probably that he doesn't agree with that, but we will remember that you think it is.

467. MR STRACHAN QC (DfT): He doesn't.

468. MR MCCRACKEN QC: Well, I mean, I would like Mr Gayler to be cross-examined about the point. I mean, it's a very simple point. He reads this as showing 6 dBA

469. SIR PETER BOTTOMLEY: You're being helpful to us. I don't think it would help for him to do that yet. Let's see what you may want to add after Mr Thornely-Taylor has spoken.

470. MR MCCRACKEN QC: Very well. Yes. Okay, so I think we then turn to slide 26, if we may. So your summary, if you would.

471. MR GAYLER: Yes. So the reduction in speed from 360 to 300 brings about a 6 dB reduction in noise level, which is the overall Leq, as we just discussed. You may get further reductions from better screening, because aerodynamic noise is less influential to the higher noise sources. Higher off the ground the noise sources are better screened.

472. MR MCCRACKEN QC: So, in other words, to be – noise attenuation barriers can be more effective where you're dealing with – yes.

473. MR GAYLER: Yes, because aerodynamic noise is less influential, so the screening is better because the noise sources are lower down. 3 dB reduction is

described as significant and with a significant positive impact. 6 dB would be substantially beneficial, the sound a third less loud or two thirds as loud, and it's reasonably practicable. The Noise Policy Statement for England suggests that you consider reasonably practical mitigation measures. It seems reasonably practical and beneficial to bring about that reduction in speed from a noise perspective.

474. MR MCCRACKEN QC: Is there any difference between the concept of reasonably practical and reasonably practicable for these purposes?

475. MR GAYLER: It's the wording. The way the noise policy statement for England words it is 'practical', and the other legislation says 'practicable'. In this case it means the same.

476. MR MCCRACKEN QC: Very good. Unless there are any further questions from the Committee at this stage, would you step down and be ready to come back after Mr Taylor? Thank you very much.

477. MR MCCRACKEN QC: Now we move onto air quality, and that's Mr Philip Branchflower. You're Philip Branchflower. You're a technical director in air quality at SLR Consulting and you're a committee member of the Institute of Air Quality Management. You've over 15 years' experience in undertaking detailed assessments of air quality from a wide range of developments, including mineral extraction development involving large quantities of spoil material, heavy goods vehicle movement, and development in areas of existing poor air quality. And you have been asked to consider the legal framework for air quality and the implications for HS2 of recent developments, the health effects caused by poor air quality and the contribution of HS2 to these, and to assess the adequacy of the methodology used by HS2 in the environmental statement, significance of its findings, and to identify clear and robust options to enable HS2 to undertake monitoring that can demonstrate compliance with legal limits and protect human health.

478. MR BRANCHFLOWER: That's correct, yes.

479. SIR PETER BOTTOMLEY: Would you like to show us your page early, rather than build up to it slowly.

480. MR MCCRACKEN QC: 35. Is this a slide?

481. SIR PETER BOTTOMLEY: Yes, yours. It's the required actions one. I really find it's helpful to know what we're being asked to do.

482. MR MCCRACKEN QC: Yes. And of course all of this has to be in the context of our – the various other measures that we're asking for, such as the independent adjudicator, but – okay, yes, so running through the actions that you think need to be undertaken. So first of all, first one.

483. MR BRANCHFLOWER: Yes, no, firstly that all the HGVs being used to move the spoil and other movements comply with the standard the High Speed Two are proposing for London, the Euro 6 standard, which is the most recent standard for HGVs.

484. MR MCCRACKEN QC: And what does that involve? I mean, Euro 6 may not mean much to people from Norfolk. It may mean a lot to people from London, but it may not mean much to people from Norfolk, so what does Euro 6 mean?

485. MR BRANCHFLOWER: Euro 6, I mean, Euro 6 for cars came in this year. There's been a lot of talk about that. It basically means that both oxide and nitrogen and particulate matter have to be very highly abated, and certainly for HGV travel, the London buses etc, a lot of the new buses have that kind of abatement fitted.

486. MR MCCRACKEN QC: So this is a European requirement that applies only to new vehicles, and therefore unless there's a commitment to that the contractors might use old vehicles that didn't comply with it.

487. MR BRANCHFLOWER: Yes.

488. SIR PETER BOTTOMLEY: I think the promoters will be able to tell us what they've told us already on some of that.

489. MR MCCRACKEN QC: Okay. Then you also want all non-road construction vehicles to comply with the London – and I think you'd better run through the acronym there, because not everybody will be immediately familiar with it.

490. MR BRANCHFLOWER: Yes, it's non-road mobile machinery. Again, it's another European directive that sets limits for – I mean, it goes from – all the way up

from, sort of, petrol chainsaws right the way up to dump trucks and bulldozers.

491. MR MCCRACKEN QC: And LEZ stands for?

492. MR BRANCHFLOWER: Low emission zone. There's the London low emission zone for cars and construction as well.

493. MR MCCRACKEN QC: And then, finally?

494. MR BRANCHFLOWER: That a dust management plan is developed for all of the community forum areas rather than the very generic one we have at the moment.

495. MR MCCRACKEN QC: Just a broad question, putting all of this in context, in the environmental statement of the promoters, do they actually consider emissions from non-road mobile machinery?

496. MR BRANCHFLOWER: No. There's no detail about that at all. There's some very unclear mentions in the code of construction practice, but in the air quality chapter they're very much ignored as a source of pollution.

497. MR MCCRACKEN QC: So what does the environmental statement cover when it comes to air quality? What does it actually look at and report on?

498. MR BRANCHFLOWER: It's very much focused on HGV movements and exhaust emissions from HGV movements.

499. SIR PETER BOTTOMLEY: On road vehicles?

500. MR BRANCHFLOWER: On road –

501. MR MCCRACKEN QC: Off-site. Off-site, yes.

502. MR BRANCHFLOWER: Off-site on the main access routes.

503. SIR PETER BOTTOMLEY: Can I, just to help us, ask Mr Strachan how far do we think the promoters can meet these requests?

504. MR STRACHAN QC (DfT): Well –

505. SIR PETER BOTTOMLEY: I'm not after the full answer, just an indication how

much more we need to dig into what's being asked for.

506. MR STRACHAN QC (DfT): Well, I think you've already heard about these issues in terms of some assurances we've given other local authorities. Euro 6 vehicles is the subject of specific assurances to both Camden and the London Borough of Hillingdon, where there are – we can put those assurances up on screen. So far as Euro 6 for the rest of the route is concerned, the effect of Euro 6 is that once vehicles are manufactured after, I think, April 2016, they will be Euro 6 compliant in any event. So it's expected that when it comes to the construction parts of the remainder of the project –

507. SIR PETER BOTTOMLEY: But there's not yet a commitment or a requirement outside of the major conurbations.

508. MR STRACHAN QC (DfT): No, for two reasons. One is that the Euro 6 point is to address air quality emissions, and where there are issues with air quality, bearing in mind it's a rapid dispersion –

509. SIR PETER BOTTOMLEY: Those are in conurbations.

510. MR STRACHAN QC (DfT): Those are in conurbations. So that's where specific assurances have been –

511. SIR PETER BOTTOMLEY: So you're proposing to say they've got that. They've got it in the –

512. MR STRACHAN QC (DfT): They've got it where it matters.

513. MR MCCRACKEN QC: What about Birmingham?

514. MR STRACHAN QC (DfT): I'll check where – the position in Birmingham.

515. MR MCCRACKEN QC: Well, it's quite important.

516. SIR PETER BOTTOMLEY: He's going to check. Is there a progressive system – the on-site vehicles, engines, sorry?

517. MR STRACHAN QC (DfT): The on-site vehicles, we've already committed to doing better than the London version of the non-road mechanical machinery

requirements, and we've explained, for example, for Camden that – in a route wide assurance – stage four plant, which is a staging in the requirement, will be used in the central activity zone from the start of the works, with 3B, or 3A with an approved diesel particulate filter, to be used on the rest of the route. So we're actually – in our – you'll recall Camden came in on route wide air quality issues, so that's why we dealt with these assurances. So I think, in effect, the commitments we've given are either the same or better than that which they're seeking.

518. Dust management, which I think was the next issue, that's already covered by the draft code of construction practice. We've commissioned research from King's College London to update the relevant guidance on monitoring within construction sites and advice on relevant trigger levels, were they to be used, and we're expecting that work to be completed at the – by the second quarter of 2016. And we've made a commitment to local authorities along the route obviously to manage significant air quality effects where –

519. SIR PETER BOTTOMLEY: So you'll aim to adopt a standard and to comply with it, require compliance with it, it sounds like.

520. MR STRACHAN QC (DfT): Well, from the research we're – the research will identify what should be the trigger levels for us to use. So, again, that is part of a detailed process of dust management, which we say is dealt with under the code of construction practice and, more importantly, is site sensitive and construction specific. So what you're doing on a particular site –

521. MR MCCRACKEN QC: Could we have the references in the CoCP to where dust management –

522. MR STRACHAN QC (DfT): Section 7.

523. SIR PETER BOTTOMLEY: So the point which won't be resolved this afternoon is the question of whether Euro 6 will be formally required outside of the areas where there isn't – it's not adding obviously to existing an problem.

524. MR STRACHAN QC (DfT): Correct. Can I just give you a bit of context to that? It will happen, as a matter of fact, because of the change in manufacturing requirements

for vehicles, but, for example, requiring small businesses, who might – and one of the aspirations is to involve small businesses. To comply with Euro 6 standards, as a matter of contractual principle, to supply parts of the route where there isn't an air quality issue would potentially preclude small businesses from taking part in the project. So those sorts of things will have to be looked at as the project goes forward, but where it matters for air quality purposes we've drawn up these specific assurances, and I'll come back to –

525. SIR PETER BOTTOMLEY: Significant points which Mr Branchflower's brought forward in most of the areas are accepted by the promoters and will be – what he's after will happen.

526. MR STRACHAN QC (DfT): And they've already been raised by the relevant air quality monitoring authorities, namely the local authorities.

527. SIR PETER BOTTOMLEY: Yes. I think, give or take some details, your witness has raised good points.

528. MR MCCRACKEN QC: Yes, but are we content that in countryside areas, for example where people are living close to a construction site or close to a route that many HGVs will use, that they don't have – that the vehicles won't be subject to Euro 6?

529. MR BRANCHFLOWER: Not particularly, no. I mean, the impact of nitrogen dioxide, which is the main pollutant we're talking about, you know, from HGVs, what they're really looking at are more than threshold pollutants, so where the existing air quality isn't very bad already the effect on health for those residents will be the same essentially, because the more – the increase is still the same. There's several hundred HGVs past their door, so whilst they may not be suffering significant health effects at the moment that increase is still going to be there, and I don't –

530. SIR PETER BOTTOMLEY: I think we understand. Thank you. I think you're being nudged to move on.

531. MR MCCRACKEN QC: Yes. Well, then I'd simply say this. First of all, astonishingly, we haven't been told whether or not we will have Euro 6 in Birmingham.

Secondly –

532. MR STRACHAN QC (DfT): It's not astonishing, because I've indicated that I would come back to you with the information which you just asked me, but if that's not good enough for you then I can't do any better.

533. SIR PETER BOTTOMLEY: It's a fair point for counsel to have made. It wouldn't have been a surprise if the answer had been known straight away, but –

534. MR STRACHAN QC (DfT): Well, I'm afraid I don't keep all of the details in my head for a project of this size.

535. SIR PETER BOTTOMLEY: It's not a criticism.

536. MR STRACHAN QC (DfT): The fault lies with me rather than the project.

537. SIR PETER BOTTOMLEY: The petitioner's counsel has asked a perfectly sensible question. Mr Strachan, you've given a perfectly sensible response, and we will hear the answer.

538. MR MCCRACKEN QC: Yes. Well, I'd simply say this, our position that Euro 6 should apply throughout the route was set out clearly in the actions that we said were required. The response was, 'Oh, we will in London', and that's a pregnant answer –

539. CHAIR: We got a slightly different response: 'We will in London but because of new vehicles it will happen anyway', except the proviso that in one or two cases there may be operators in certain areas who wish to tender for work who have older vehicles. Are you going to exclude them?

540. MR MCCRACKEN QC: Well, that's not at all, with respect, reassuring. What he's saying is –

541. SIR PETER BOTTOMLEY: We've heard and we can interpret. Our life, like yours, is about discussion and argument and picking up meaning. Let's leave it like this: if it turns out that in Birmingham where there's – significant work's going to happen, they're going to use vehicles which are – meet lower standards than the ones in London, that might surprise us, and it might surprise a Committee in the House of Lords. Let's just leave it like that for the time being.

542. CHAIR: We don't even know whether Birmingham city asked for those standards.

543. MR MCCRACKEN QC: I don't think it matters whether the city asked for it. Lots of local authorities don't do what's in the interests of their people, and where health is concerned we need not simply to rely upon the resources of local authorities to be able to cover all points, with respect, sir. Right, well –

544. CHAIR: I think you're winning most of these points, so shall we move on?

545. MR MCCRACKEN QC: Yes, of course. Can I simply say that insofar as matters are left, as it were, in the air, it only reinforces the arguments in favour of the independent adjudicator, and I –

546. SIR PETER BOTTOMLEY: That doesn't follow logically, and you're going to get a pen tapping on the table soon if you don't move on.

547. MR MCCRACKEN QC: Alright. Well, in that case we move onto the next witness who is – and I should add, by the way, monitoring is something that we've asked for, and that's not proposed, but slide 36, perhaps, is just worth putting up on screen, because that's not on the –

548. SIR PETER BOTTOMLEY: We can ask Mr Strachan to respond to that when it comes to the response.

549. MR MCCRACKEN QC: Yes. I mean, the monitoring is very important. It was conceded for Crossrail but it's not being offered here. So we'll move onto our next topic, which is – I think it may be convenient as the next topic to deal with greenhouse gas emissions, so that takes – the slide – the first slide is 68, greenhouse gas emissions. It may be helpful to deal with that. And that is Julie Gartside, and you are – you have a first class master's degree in mechanical engineering energy systems.

550. MS GARTSIDE: Yes.

551. MR MCCRACKEN QC: You have 15 years' experience in delivering carbon and energy mitigation strategies. You produce greenhouse gas lifecycle assessments for construction companies, councils, food and drink companies. I think you have to

articulate your yes so that it goes into the record –

552. MS GARTSIDE: Sorry, yes.

553. MR MCCRACKEN QC: – so nodding won't do. You've supported governments on carbon development policy and low carbon development strategies.

554. MS GARTSIDE: Yes.

555. MR MCCRACKEN QC: And you wrote and delivered the Carbon Trust workshop on carbon footprints.

556. MS GARTSIDE: Yes.

557. MR MCCRACKEN QC: And you're chair of the Emissions Trading Group's Domestic Measures Group.

558. MS GARTSIDE: Yes.

559. MR MCCRACKEN QC: Okay. Now, slide 70 please.

560. SIR PETER BOTTOMLEY: This goes on to slides 78 and 79, I think, in terms of the recommendations. It's always a good idea for us to have the recommendations in our minds when we start.

561. MR MCCRACKEN QC: Right, let's have a look at that, but I think in this particular instance it may be very – it may in this instance be helpful to actually explain how we get to the recommendations. Unless you know what it is – how we get there –

562. SIR PETER BOTTOMLEY: Well, the biggest problem I've got in doing that, having looked through them, is when you get to 78 you've got a suggestion that if you reduce the maximum speed from 300 – assuming the word 'maximum' ought to have been there, the maximum speed 360 to 300 results in 23% energy saving. I think we've already established in practical terms going to either Birmingham or Crewe or Leeds you're saving probably about 4% not 23%, because you aren't going at 360 all the time.

563. MR MCCRACKEN QC: Would you like to comment on that?

564. MS GARTSIDE: I appreciate the maximum speed isn't going to be 360

throughout the cycle of the journey.

565. SIR PETER BOTTOMLEY: The average speed's not going to be 360, yes.

566. MS GARTSIDE: So the maximum operational carbon emissions, so those are the emissions every year that HS2 is going to emit as it's – once it's constructed and it's operating. The annual emissions – if it was 360 for the whole journey it would be 20% saving, reducing the speed, so accepting that it's not going to be 360 for the whole length of the journey it's probably somewhere between 5% and 20%, but we need to look at those speed profiles.

567. MR MCCRACKEN QC: So would you be able to look at those and produce a note for the Committee on that?

568. SIR PETER BOTTOMLEY: All we know is it's not 23%, and we were offered 19% earlier on by one of the witnesses, yes.

569. MS GARTSIDE: But that's speed, so this is specifically looking at the carbon emissions, and it would probably be up to a maximum of 20% reduction in carbon emissions for the annual operating –

570. SIR PETER BOTTOMLEY: Does that include the regenerative braking?

571. MS GARTSIDE: Yes.

572. MR HENDRICK: Apart from the carbon emissions as a result of obviously energy that's been supplied to the grid, what other emissions are – sorry, what other carbon emissions are there?

573. MS GARTSIDE: So can we skip to –

574. MR MCCRACKEN QC: Why don't we look at – shall we look at 74 for a moment? That may be a useful one, because there you look at how HS2 has assessed the emissions, don't you, and they say that the gross emissions over 60 years would be about 8.4 million tonnes.

575. MR HENDRICK: Sorry, I was talking about operation and maintenance. I wasn't discussing construction.

576. MR STRACHAN QC (DfT): I don't know if it helps, and if it doesn't I'll be told it doesn't, but in our environmental statement, the route wide effects, we did, amongst other things, carry out an assessment of reducing the speed in terms of carbon footprint from 360 to 300 kilometres per hour. That's at page 55 and it's at paragraph 5.5.32. We estimated it would make approximately 7% difference to the operational carbon footprint of the scheme, and we identified why this is ultimately, I would suggest, a matter for Parliament to take into account. We identified why that saving was not – did not justify the consequential dis-benefits of operating at 360 –

577. MR HENDRICK: Well, the 7% is between 5 and 20.

578. MR STRACHAN QC (DfT): It is indeed between the 5 and 20, but it's closer to the 5.

579. MR HENDRICK: Quite a big gap there, but, you know.

580. MR STRACHAN QC (DfT): Do you want me to put that on – just so you can see the relevant extracts, it is an exercise that –

581. MR HENDRICK: The 20's just above the 19 and the 7's just above the 5.

582. MR MCCRACKEN QC: So it's conceded that there would be a 7% reduction in the carbon footprint in operational terms, yes. Now, can we just for a moment have a look at the way that the HS2 assessed emissions, and we note that they suggest that modal shift, that's presumably of passengers, would be 3.2 million tonnes, and that freight uptake of released capacity would be 2.1 million tonnes, tree planting 0.5 million tonnes. Do you have any comments on those calculations, those estimates?

583. MS GARTSIDE: Just referring to the graph in this slide, the grey box where it talks about the operation and maintenance and construction emissions, the purpose for me of the greenhouse gas assessment is not just to derive a number. It's to derive by how much that number could reduce by. And what we haven't seen yet, and I know that there's a commitment but I would like it to be brought forward, is to look by how much that 8.4 million figure overall can be reduced. And the other little graph there, which is the diagram with the coloured areas, what's usual in a greenhouse gas assessment is to predict the carbon emissions that are going to happen as a result of a project, and then

look at different measures and how they can reduce those carbon emissions. So we've had tree planting as one potential suggestion, which I think needs to be examined very carefully.

584. What we've got in this graph, we haven't got a model of – or predictions as to what different measures could be implemented, like use of recycled steel or recycled aggregates. We've got this is what the emissions are predicted to be at the moment and then this is what will be – in a broader context what savings will be achieved because of other things that happen as a result of HS2, but in the broader economy, so that a lot of that is – the 2.1 and the 3.2 in that graph is modal shift. So that's assuming that because of HS2 people will stop using their cars, there'll be less flights, there'll be more movement of freight from the motorways to the released rail capacity.

585. We haven't seen any analysis behind those numbers or the assumptions, and we would very much welcome for the data and the assumption behind those numbers to be released, because that's a very, very significant saving of carbon which is being predicted. The tree planting I see as a mitigation measure, and it should be evaluated in conjunction with all the other mitigation measures to make sure it's the best economic and environmental outcome.

586. MR MCCRACKEN QC: In assessing what the reduction would be achieved by the tree planting, do you need to know what kind of trees you're planting?

587. MS GARTSIDE: There's a whole load of detail I would like to see on that which I haven't seen, I'm afraid.

588. MR MCCRACKEN QC: Okay. And, now, in terms of modal shift, 3.2 million tonnes, modal shift from air to train, is that affected by the fact that the connections that were previously proposed to HS1 have been removed?

589. MS GARTSIDE: I don't know. I'm sorry.

590. MR MCCRACKEN QC: Right. Okay.

591. SIR PETER BOTTOMLEY: I think that it's an interesting thought, but I don't think it's critical to the argument.

592. MR MCCRACKEN QC: Well, I think it may be a matter of submission. If you're not connected up to HS1 you can't – if you can't go from Manchester to Marseilles –

593. SIR PETER BOTTOMLEY: The point in your mind we understood straight away.

594. MR MCCRACKEN QC: Yes, indeed.

595. SIR PETER BOTTOMLEY: It's better than swimming across the channel.

596. MR MCCRACKEN QC: Yes. Okay. Right, let's – if we look at your slide 75, what is it that Government – oh no, we need to go back actually because I think in terms of whether 7% is significant or not we need to look at what the targets that the Government –

597. SIR PETER BOTTOMLEY: 7% is significant, but it's not nearly as significant as 23%.

598. MR MCCRACKEN QC: No, accepted, but then if you look at what we're trying to achieve in 72, and if we could have 72 please up on screen. Clerk, 72 please. Thank you. Oh, whoever it is. 72. Sorry.

599. SIR PETER BOTTOMLEY: Technical expert.

600. MR MCCRACKEN QC: Yes. If we look at that graph we can see, for example, in 2014 if you compared what we were emitting in 1990 with what we emitted in 2014 we were down by 36%. Well done us, but by 2020 we've got to go down another 9%.

601. MS GARTSIDE: Yes.

602. MR MCCRACKEN QC: Help me on this: relatively speaking, how does the ease of reducing our emissions change as we go down?

603. MS GARTSIDE: So over the last few years we've implemented quite a lot of what we would call quick wins, a lot of easy things that are capable of doing that that have –

604. MR MCCRACKEN QC: Low hanging fruit.

605. MS GARTSIDE: Yes, that's the good phrase.

606. SIR PETER BOTTOMLEY: Like exporting our heavy industry to other countries and not having smoke stacks.

607. MS GARTSIDE: And that has not helped. It is a lot of things. Going forward –

608. MR MCCRACKEN QC: Indeed, yes.

609. MS GARTSIDE: Going forward, industry and domestic emissions and travel, there's needed to be a lot of capital investment to continue that path to decarbonisation, and the targets are very, very aggressive.

610. MR HENDRICK: Could I just – on that point, I mean, it was mentioned earlier that you chair one of the emissions trading committees or panels. Clearly the UK has limits, and I would imagine that factored into the energy that's supplied to the grid is the carbon that is produced from power stations as is now, as I understand it, as well, aircraft emissions, which through modal changes some of which we hope will transfer as a result of HS2. Can I ask the question more generally? I mean, obviously it's good to have lower emissions and more efficient usage of energy, but would you accept that whatever happens that Britain will – the UK will still have the same obligations as to the Emissions Trading Scheme, and will have to keep to them irrespective of whether HS2 is 7% more or 7% less efficient?

611. MS GARTSIDE: I agree we have our obligations under the EU emissions trading scheme. What I'm hoping for through HS2 is that we commit to the best environmental and economic outcomes to make sure we keep the carbon emissions to a minimum.

612. MR HENDRICK: So we get the best contribution, yes. So it's not necessarily the fact is the diagram would show that we're likely to actually breach our emissions trading obligations, it just that we may not come down as quickly as we might like to.

613. MS GARTSIDE: This graph is from the Committee on Climate Change and it uses DECC's latest energy projection figures. This is our carbon budget. This is what we are challenging ourselves as a country to try and commit to, and how we get to that EU ETS is part of this, but it's not the sole solution.

614. MR HENDRICK: Of course.

615. MR MCCRACKEN QC: Can I ask you this question? If we decided not to take advantage of the 7% reduction that we could get through reducing the speed to 300 kilometres an hour, might that have an effect on what we allowed small businesses to emit?

616. MR HENDRICK: It's very tenuous.

617. MS GARTSIDE: If energy consumption is higher and carbon emissions are higher than they need to be through any part of the economy it makes the burden higher for everybody else to meet.

618. MR MCCRACKEN QC: Thank you. Yes, that's – I mean, it might not be small businesses. It might be old ladies who can't afford –

619. SIR PETER BOTTOMLEY: It's quite a stretch of argument, and the fact is, to me, to target – were you not to have the extra 7% of 360 kilometres per hour, then meeting a national target wouldn't require quite so much from everywhere else is what we're being told, yes?

620. MR MCCRACKEN QC: It would be –

621. MR HENDRICK: That was my point.

622. SIR PETER BOTTOMLEY: Which we got before – you don't need to hammer that point.

623. MR MCCRACKEN QC: Alright, yes. Very well. Can I just put it, finally, just in one broad way, from your broad experience of what we've done so far, what we've got to do and how easy or difficult it's been, can we afford to lose 7% of reduction?

624. SIR PETER BOTTOMLEY: On this particular project in operation.

625. MR HENDRICK: Given the scale of the national consumption and the percentage that this scheme is likely to –

626. SIR PETER BOTTOMLEY: The outcome to your question may make more sense than the question.

627. MS GARTSIDE: Every area of the economy is being asked to do its bit, and steel industry, paper industry, food and drink etc, all areas and domestic buildings, everywhere is being asked to do its bit. Sorry to quote a famous retailer but 'Every little helps'.

628. MR MCCRACKEN QC: Yes, thank you. Thank you very much. Yes. Right. Now, you talk – you deal with trees and so on, and in slide 76 you make the point that offsetting standards should be followed, if adopted, to ensure additionality and permanence. So just taking the 0.5 million tonnes of carbon emissions which HS2 assumes it can achieve, are they adopting an approach to achieving that that's consistent with adequate standards?

629. MS GARTSIDE: At the moment the approach proposed – if trees planted is a good mitigation measure to implement, at the moment there is no mention of external standards for ensuring that those CO2 emissions that they're – the trees are planning on sequestering, that they are permanent and additional to what is above and beyond the scheme's remit, and above and beyond our commitments. Permanence means that – and there has been cases in the last decade where trees, forests, have been planted to offset emissions, but they have not been managed carefully and they were basically subject to fires, and all that good work was undone.

630. So the idea of permanence is to make sure that, if there is a tree planting scheme, that beyond the life of the HS2 construction and into its operational phase that because these are emissions that are being sequestered and offset for the lifetime of the project that that – those trees and that – the land that's used is managed for the life of that scheme to ensure that that sequestering continues. There is a standard called PAS 2060, which the UK Government was part of developing in association with the British Standards Institute. That sets out clear requirements to ensure that any offsetting project achieves additionality, it achieves permanence, and that that – the forests, or the area where the trees are, are protected so that those CO2 emissions are actually achieved, those savings.

631. CHAIR: May I ask, the 2 million trees you want planted, is it on the land required for the Bill or do you require more land to be taken from farmers in order –

632. MS GARTSIDE: The 2 million trees is taken from the HS2 literature, and it sets

out where those trees would be put, some along the line, some of them places. But some of that land I think it says after five years will be reverted to other owners, landowners, so that is at the mercy of those new landowners about what they do with those, which would risk the permanence of this.

633. MR HENDRICK: But is that not true of trees anywhere?

634. MS GARTSIDE: Sorry?

635. MR HENDRICK: Isn't that true of trees anywhere?

636. MS GARTSIDE: If the tree planting is being part of the environmental benefits of this scheme, and those 0.5 million tonnes of CO2 are going to be said that's what we're going to achieve as a saving, then it needs to be guaranteed that that actually gets achieved. And if it's at the mercy of landowners that don't have a contract in place or a standard to work to –

637. SIR PETER BOTTOMLEY: I used to plant a million trees a year when I was junior Minister for Transport, and I think most of those trees are there. One or two may have fallen over in 30 years but most still seem to be there without guarantees. I'm not sure that –

638. MR MCCRACKEN QC: But the trees you were planting when you were Minister of Transport were, I think, Sir Peter, not directed towards carbon sequestration.

639. SIR PETER BOTTOMLEY: They had the same effect.

640. MR MCCRACKEN QC: Well, they did, but the motivation for those people wanting the trees was somewhat different, and therefore their willingness to keep them was somewhat different. And picking up, as it were, a similar point by Mr Hendrick, if I have a copse which I use for shooting, or which I use as part of the landscape of my country house, it's there. I want to keep it. It's there at the moment because I, the landowner, want it to be there. But of course with these trees they aren't there at the moment, and they won't necessarily stay there later on. They're being put in for the purposes of HS2.

641. MR HENDRICK: I think whoever owns the land once the trees have been put in,

I think obviously they'll be clear why the trees were put there, but are you suggesting some sort of tree guarantee, perhaps a preservation order on every –

642. MR MCCRACKEN QC: Well, the PAS – all the –

643. MS GARTSIDE: The Government were part, in 2010, of developing this PAS 2060 –

644. MR HENDRICK: You said that, but what's in there that commits the future of that tree?

645. MS GARTSIDE: The purpose of the PAS is to do rigorous checks, to make sure there is a commitment, there's the legal framework, and that that CO2 saving is going to be permanent.

646. MR HENDRICK: And is there legislation to support that?

647. MS GARTSIDE: No, this is a voluntary code, PAS 2060.

648. MR HENDRICK: Well, there we are.

649. MR MCCRACKEN QC: But they can commit to complying with PAS 2060, and if we have the environment – if we have the independent adjudicator then he can ensure that they comply with that. So it is quite possible to achieve permanence. You know, there's no doubt that it can be achieved. And of course if it be the case that the landowner would be likely to want to keep the trees then there'd be no difficulty in him signing up to a permanent arrangement. There's only going to be a difficulty in signing up to a permanent arrangement if there isn't really a willingness to keep them there.

650. MR HENDRICK: I think that's a bit far-fetched.

651. MS GARTSIDE: If there isn't a commitment to definitely guarantee that that sequestration will happen then it shouldn't be in the draft or in the report to say that this saving will be achieved.

652. SIR PETER BOTTOMLEY: I think we'll come to a view on that.

653. MR MCCRACKEN QC: Yes, okay. Well, now running – bearing in mind that the Committee will come to a view, can we just run through the four recommendations?

The first one is that there should be quantification of the potential emission reductions from various mitigation measures with an associated cost benefit analysis.

654. MS GARTSIDE: Yes.

655. MR MCCRACKEN QC: And your evidence is that has not been done and you'd expect it to be done in accordance with good practice.

656. MS GARTSIDE: Yes.

657. MR MCCRACKEN QC: Yes. Secondly, that the assumptions and research substantiating the potential modal shift should be made publically available for review and comment.

658. MS GARTSIDE: Yes.

659. MR MCCRACKEN QC: And in your view have they been?

660. MS GARTSIDE: I haven't seen the detail to be able to review those properly.

661. MR MCCRACKEN QC: Okay. And then you want a full environmental cost benefit analysis of implementing the sequestration project.

662. MS GARTSIDE: Yes.

663. MR MCCRACKEN QC: And you want them to be subject to PAS 2060, to which the Committee's going to form a view on, and finally –

664. SIR PETER BOTTOMLEY: This is sequestration by growing vegetation, trees –

665. MR MCCRACKEN QC: Yes.

666. SIR PETER BOTTOMLEY: Rather than sequestration in terms of smoke stack emissions and power stations.

667. MR MCCRACKEN QC: We're not talking about carbon capture and storage here. We're talking about tree planting. Yes, I mean, it's perhaps rather a grand term, in a sense. Modelling emissions associated with subsequent phases should be started so you can understand – what do you mean by that?

668. MS GARTSIDE: Some of the mitigation measures that should be modelled to see what the alternatives are for reducing the carbon emissions may be more cost beneficial if they are extended out and committed to for subsequent phases, so it might help the business case for some mitigation measures.

669. MR MCCRACKEN QC: Alright. If you'd wait there for any questions if there are any. Thank you.

670. MR STRACHAN QC (DfT): No, I propose – well, I was just going to ask the witness whether you had seen these documents, which are all publically available, and then these, which set out the modal – the calculations of modal split.

671. MS GARTSIDE: We haven't seen the calculations on the carbon front.

672. MR STRACHAN QC (DfT): Right. Well, you've seen all this. Okay. For those who are watching, there are available, both in the route wide effects section 3, an assessment of the scheme in terms of climate change, which includes the section I referred the Committee to a moment ago considering the implications of reducing line speed from 360 to 300 kilometres per hour. They also deal with modal shift, the way that – what modal shift assumptions have been made, along with the construction phase, for example how construction emissions are calculated depending on types of construction, but I'll – rather than take the Committee's time I'll deal with that in a response in a moment.

673. MR MCCRACKEN QC: Do you have any comment on that characterisation by Mr Strachan of those documents which you said you had seen?

674. MS GARTSIDE: I've seen the documents but we can't – we haven't seen the carbon calculations that correlate that we can then substantiate those numbers.

675. MR MCCRACKEN QC: So if Mr Strachan were seeking to imply into the record that those documents actually do set out the relevant data, what would your comment be on that?

676. MS GARTSIDE: I think they set out the assumptions but I haven't seen the calculations, how they're used.

677. MR CRANE: Can I just say something very quickly? In our petition we asked for – it was a calculation done by the company engaged by HS2 for the carbon assessment. We wrote to HS2 asking for it and got no response, so we emphatically have not seen the methodology used to calculate the carbon which is set in that report.

678. SIR PETER BOTTOMLEY: Potential modal shift into carbon efficient influence.

679. MS GARTSIDE: Yes.

680. MR CRANE: We've asked for it. We haven't got it.

681. SIR PETER BOTTOMLEY: Sorry, I wasn't asking you to repeat what you said just now. That's the point of this. So it's not a question of what their estimates are of modal shift. It's a question of what the consequences of that modal shift might be in terms of carbon emissions.

682. MR CRANE: Precisely.

683. SIR PETER BOTTOMLEY: Yes.

684. MR MCCRACKEN QC: Okay. Thank you very much.

685. MS GARTSIDE: Thank you.

686. MR MCCRACKEN QC: The next witness is Colin Pill, who deals with landscape and visual matters. Can I just indicate that the witness after this is Ms Treweek, who deals with ecology, but she has to fly to Scotland tonight for a funeral and needs to leave here by six o'clock, so I understand the Committee normally sits – takes a break at half past five rather than earlier than that, so I would hope we'd be able to cover her before that break.

687. CHAIR: If you're quick with your current witness then of course we'll get her on. Yes, we'll deal with that.

688. MR MCCRACKEN QC: Okay. 38 in the slides. You're Colin Pill. You're a chartered landscape architect and partner with Tyler Grange, and your firm's one of the country's leading environmental consultants.

689. MR PILL: Yes.

690. MR MCCRACKEN QC: You're going to talk about landscape and visual assessment, and you're going to discuss the environmental statement and the extent to which HS2 has followed good practice, and your instructions were to take an independent view. Slide 39 you explain what LVIA is.

691. MR PILL: Yes.

692. MR MCCRACKEN QC: What does it stand for, first of all?

693. MR PILL: It's landscape and visual impact assessment.

694. MR MCCRACKEN QC: Right. And it's a process, yes?

695. MR PILL: It's a process and it's a tool for assessing change in the landscape.

696. MR MCCRACKEN QC: But it's only one of three different but related assessments, one of which is townscape assessment.

697. MR PILL: That's right.

698. MR MCCRACKEN QC: Which would obviously be appropriate in the urban area.

699. MR PILL: Yes, that's right.

700. MR MCCRACKEN QC: Okay. And then slide 40 you explain the guidance that should be followed, and the Landscape Institute and Institute of Environmental Management and Assessment have produced a third edition of their guide.

701. MR PILL: Yes, this one here.

702. MR MCCRACKEN QC: Yes. And you then set out on this slide some key components and steps of LVIA, and you're going to discuss the extent to which they have been achieved here. Slide 41, as it were, sets the scene by explaining that you consider the four bullet points set out there to be ones where there's non-compliance with the guidance.

703. MR PILL: That's right.

704. MR MCCRACKEN QC: And I'm going to get you to start with slide 42.

705. MR PILL: Okay.

706. MR MCCRACKEN QC: So dealing with the first point on slide 42 –

707. SIR PETER BOTTOMLEY: It may not be a question for this witness but generally, in the urban areas what proportion of the urban areas are tunnelled?

708. MR MCCRACKEN QC: I think we need to phone a friend on that one, sir, and we may well come back to it.

709. MR CRANE: I know a rough figure but I don't want to give you an exact – I don't want to give you –

710. SIR PETER BOTTOMLEY: So far as most, is it, except parts of Birmingham where you're running along the existing railway line?

711. MR CRANE: I think most is the right characterisation.

712. SIR PETER BOTTOMLEY: We'll keep that in mind as we hear the questions to the witness.

713. MR MCCRACKEN QC: Yes. Right.

714. MR PILL: Well, in terms of the type of assessment, the environmental statement deals with landscape and visual impact assessment but, as I said, there are also other assessments. And where you're in an urban environment something called townscape and visual impact assessment is relevant, and it has different criteria, looks at different –

715. SIR PETER BOTTOMLEY: Can anyone give me a kilometre stretch of urban area where you haven't got an existing railway line?

716. MR PILL: Within the CFA areas there are at least five in London that are in urban context.

717. SIR PETER BOTTOMLEY: That aren't along existing railway line?

718. MR PILL: Well, they're in the urban landscape, the urban townscape, so… I

can't…

719. SIR PETER BOTTOMLEY: I don't normally like to repeat my question. I haven't yet got what the problem is. Where is the HS2 line going somewhere in the town landscape that's – in the open air that's not alongside an existing railway?

720. MR MCCRACKEN QC: Would you like to comment, as it were, on the extent to which where you add –

721. SIR PETER BOTTOMLEY: Maybe we're discussing a problem that isn't there.

722. MR MCCRACKEN QC: No, that's why I'm asking this question. I'm picking up on the point you're making, Sir Peter. Where the railway line widens an existing railway line, can that have landscape effect, or townscape effects I should say?

723. MR PILL: It needs to be clear whether it's a landscape assessment or a townscape assessment. There are different –

724. SIR PETER BOTTOMLEY: That I understand. I'm trying to ask until someone can give me a significant stretch where you are actually making a difference to existing townscape on the surface.

725. MR PILL: I believe that's all the stretches within London. There are elements –

726. SIR PETER BOTTOMLEY: But most of it's been tunnelled.

727. MR PILL: Some of them are tunnels where they have elements above ground. They have changes to roads and vent shafts.

728. SIR PETER BOTTOMLEY: Well, if, for instance, you're here to talk to us about the vent shafts we can – pretty briefly, can't we?

729. MR MCCRACKEN QC: Well, can we take it in two stages? On the one hand, where you've got a tunnel you say there are things above ground and they should have been subject to a townscape assessment. Can I also ask you though, where you've got a stretch of line that's not in a tunnel that widens an existing bit of track, can that have a significant effect on the townscape?

730. MR PILL: Absolutely. There are changes which, if you do a landscape

assessment, they are not the same changes that you would have on a townscape assessment. There are different criteria, there are different effects, and those are quite different, and so, in my opinion, there should be a townscape assessment.

731. MR MCCRACKEN QC: Okay. So that's your answer to Sir Peter's question. Then what about night time effects?

732. MR PILL: Night time assessment has been covered very briefly and, in my opinion, not appropriately for, again, potential changes. There is no night time baseline that's been done. There is very, very brief mention of it, and some of the construction effects and some of the permanent operational effects are within areas where there is no lighting at present, and so you can't be clear on what the significant lighting effects would be of the proposals, but you would expect there to be some. And I just don't feel that it's been appropriately covered in the environmental statement.

733. MR MCCRACKEN QC: Yes.

734. MR PILL: The level of detail isn't there, the evidence base isn't there, the baseline isn't there, and so you can't then understand what the change or the effects are.

735. MR MCCRACKEN QC: If a properly conducted study were being undertaken that covered a matter that wasn't significant, would you expect it to be ignored or to be covered with the conclusion that it wasn't significant?

736. MR PILL: It needs to be covered, yes.

737. MR MCCRACKEN QC: Yes. And what conclusion do you draw about the general reliability of the study if it wasn't covered?

738. MR PILL: It means that there would be effects that you don't know what they are. You cannot – it is not robust.

739. MR MCCRACKEN QC: Okay. Now I want you to turn to other aspects of non-compliance with the guidelines, study areas, slide 44.

740. MR PILL: The study areas. The methodology of HS2 says that study areas would be agreed, and what we're looking at when we look into the assessment is that these study areas have not, in some cases, been set out. In other cases, they've been given a

corridor of either a kilometre or half a kilometre from the track. They're not consistent and, again, that means that sometimes the effects of a proposal are not fully understood. And that's –

741. MR MCCRACKEN QC: What about the level of assessment and analysis?

742. MR PILL: The level of assessment and analysis doesn't follow GLVIA3. It is a very, very high level assessment. It doesn't look at – particularly at landscape character in enough detail. It doesn't look at the components of the landscape character. It doesn't look at the key characteristics, the elements, the features, and so you have a baseline, i.e. the existing landscape, you do not know what's there. You don't know what the receptors are, and so you cannot possibly understand what the level of change is or who that would affect and what the significance is.

743. SIR PETER BOTTOMLEY: Can you remind me what ZTV OLE stands for?

744. MR PILL: ZTV is zone of theoretical visibility.

745. SIR PETER BOTTOMLEY: Zone?

746. MR PILL: Theoretical visibility.

747. SIR PETER BOTTOMLEY: Yes.

748. MR PILL: It's basically a computerised model –

749. SIR PETER BOTTOMLEY: Yes.

750. MR MCCRACKEN QC: It's based upon altitudes and so on, without having regard to intervening topographic –

751. SIR PETER BOTTOMLEY: I'm just asking.

752. MR MCCRACKEN QC: Yes.

753. MR PILL: So the overhead line equipment, which are any gantries and electrification.

754. MR MCCRACKEN QC: Now, how important is the omission of overhead line

equipment when it comes to carrying out a landscape assessment?

755. MR PILL: Well, they are potentially significantly visual elements of the scheme. They're elements that are above ground. They can go up some considerable distance, and also they have visibility and they would be seen, particularly in open landscapes. If those were then on top of, say, some embankments, again, it just raises the visual effect of that particular part of the line.

756. MR MCCRACKEN QC: And then the penultimate point on this page, viewpoints – page 44, viewpoints.

757. MR PILL: Yes. The methodology again states that – and good practice within any environmental statement are the viewpoints are agreed in advance. There is some evidence there's been consultation of viewpoints and locations, but there isn't evidence that those have been fully agreed with the relevant parties, including, in the Chilterns, the AONB board.

758. MR MCCRACKEN QC: And then what about the illustrative material?

759. MR PILL: There is again strong – strict guidance on the presentation of particularly photomontages and baseline photography. There's a Landscape Institute advice note, 11/1, which specifies how the information is presented on the page so that they aren't misrepresentative and that you can see the effects of them. And that includes viewing distance, height of image, which again hasn't been followed.

760. MR MCCRACKEN QC: And to what extent does taking, for example, an excessive viewing distance, what kind of effect does that have on the impression of the –

761. MR PILL: It can underplay the effect. It can underestimate it. An important part of communicating the landscape assessment is how you present the information.

762. SIR PETER BOTTOMLEY: Appreciate that. We've had a lot of presentations, and I think that we can get onto the constructive points as soon as we can.

763. MR MCCRACKEN QC: I won't labour the point then. And then I think you make the comment on slide 45 that trying to follow what's been undertaken by way of

assessment is trying to follow a paper chase, and, to use a phrase of Mr Latham's this afternoon –

764. SIR PETER BOTTOMLEY: Can we accept that the scheme has not been designed in detail yet, so some of the things which we read in these sensible slides couldn't be done until it has been designed more in detail, the options for detail have been worked on.

765. MR PILL: I can accept the detail. The problem I have is that the baseline information, i.e. what is there in the landscape at present, isn't fully understood, and, whether you have the detail of the scheme or not, the evidence base of what's there at the moment is crucial.

766. SIR PETER BOTTOMLEY: I understand that. Can we keep tracking on?

767. MR MCCRACKEN QC: Now, Sir Peter wants us to move to putting it right on slide 47, and I'm very happy to do that. So what should be done?

768. MR PILL: Well, I'm suggesting that other assessments need to be done. Those include the townscape and visual impact assessments of areas of the CFAs that – within the urban environment. A proper night time assessment of the route needs to be undertaken, so there is a proper baseline, again, for which you can identify the receptors, the existing light sources, and then look at the scheme to find out where the proposed light sources are and the effects of those on the particular receptors are done. Another assessment is the cumulative assessment, which is an important part of EIA, and that has been touched on in the environmental statement but is not thorough enough.

769. There needs to be much more work on the landscape and visual baseline in terms of the way that the characteristics, the features, the elements are looked at and identified. And it's something which, in terms of the level of detail that's been provided, we – obviously the company I work for do a lot of assessment work, and often some of the very, very small schemes I've worked on have much more in depth descriptions of character and analysis than what I'm seeing in the HS2 work. So it needs to be appropriate to the type, the scale, the magnitude of development that is being proposed.

770. MR MCCRACKEN QC: Can I just go back for a moment to the second bullet

point, night time assessment?

771. MR PILL: Yes.

772. MR MCCRACKEN QC: To what extent at the moment has the assessment actually considered which areas have dark skies or broadly dark skies, at the moment?

773. MR PILL: Within the assessment I think there's a couple of lines on night time assessment. There's no night time photography, so – which would have been a useful way of recording dark skies or where the light sources are, and at present there isn't any. It's very minimal.

774. MR MCCRACKEN QC: Okay. We're at the – our pre-penultimate point, I think. Many more photomontages required to help people understand, and they need to be produced in accordance with the strict guidelines.

775. MR PILL: Yes.

776. MR MCCRACKEN QC: And then the penultimate point.

777. MR PILL: Mitigation proposals. Again, at the moment it's a very high level, and lots of that mitigation relates to screening. And sometimes with screening itself the type of tree planting, if you're talking to that, will in itself have an adverse effect if it's not in the – designed correctly or specified correctly for the type of landscape that it's going into. So we have to be very careful with mitigation that it does the job it sets out to do and doesn't actually cause additional effects.

778. MR MCCRACKEN QC: Are there tensions between the different objectives you have for tree planting as, for example, carbon sequestration versus landscape integration versus landscape screening, for example?

779. MR PILL: Yes. There'll be different species, different mixes, different characters of tree planting.

780. MR MCCRACKEN QC: Does the environmental statement and the material presented enable us to know how those conflicts will be resolved?

781. MR PILL: It doesn't, no.

782. MR MCCRACKEN QC: Thank you. And that takes us neatly to the last point. You want a detailed set of parameters for assessment purposes.

783. MR PILL: Yes. We're aware that the scheme is yet to be fully detailed. It would have been very helpful and is normal practice, particularly on outline applications, to have a set of parameters which give a different series of levels of information, so you can test it against worst case and various other things, so that people are fully aware of what to do.

784. MR MCCRACKEN QC: Okay. If you wait there then, in case there are any questions.

785. CHAIR: Do you have any questions, Mr Strachan?

786. MR STRACHAN QC (DfT): Well, I was just going to refer the witness to the Scope and Methodology Report, dated November 2013, which I assume you've read. And that was subject to consultation, wasn't it, with local authorities, statutory consultees, including the Landscape Institute and Natural England, in identifying the correct scope and methodology for this environment at stake?

787. MR PILL: Yes.

788. MR STRACHAN QC (DfT): Yes. And likewise, the third edition of the guidance documents that you've identified came out after the consultation and work on this environmental statement, didn't it?

789. MR PILL: It was a matter of months, I believe, after it, and –

790. MR STRACHAN QC (DfT): Yes. And the guidance is – from the Landscape Institute is to continue using your – the second edition of the guidance if you have started your assessment work, which is of course what was done, but in addition in the environmental statement account is taken of additional points and guidance in the third edition. For example, dealing with how you treat landscape character. So where it's appropriate those additional points have been taken into account in this Environmental Statement, haven't they?

791. MR MCCRACKEN: Well, Mr Pill, can I first of all ask you –

792. MR STRACHAN QC (DfT): Well, I think I was asking the questions actually.

793. MR MCCRACKEN: Fair point. But I think in that case I'd like to be clear. It's been suggested that none of the consultees raised criticisms of the scope and methodology.

794. SIR PETER BOTTOMLEY: I don't think we heard that.

795. MR MCCRACKEN: Well, that was the inference that we were expected to draw from the question.

796. SIR PETER BOTTOMLEY: You're being more sensitive than we are.

797. CHAIR: Answer Mr Strachan's question.

798. MR PILL: In terms of GLVIA3, the draft version was out some time before this was published and, yes, there was guidance on what to do when the new guidelines came in. But even GLVIA2 required more in depth analysis and particularly looking at characteristics than the GLVIA3. So it doesn't make a massive amount of difference.

799. MR STRACHAN QC (DfT): Rather than take a lot of time going through our points of disagreement on what's contained in the Environmental Statement, just to make it clear we don't accept your criticisms of it. But can I just deal with, for example, the landscape point? In addition to the point about the percentage of the line that goes through townscape, the scope and methodology of the report identifies specifically, doesn't it, that for the purposes of the document the definition of 'landscape' includes townscape, countryside, villages, towns and cities, and to avoid the use of interchangeable terms such as 'townscape' the term 'landscape' has been used throughout. That's explained in the scope and methodology report, isn't it?

800. MR PILL: Yes, but it's a very old-fashioned –

801. SIR PETER BOTTOMLEY: It doesn't undermine the point that he has put.

802. MR STRACHAN QC (DfT): Well, the next point is you may not agree with it but there is an assessment of the effects of the railway line when it is in a town as a matter of principle.

803. MR MCCRACKEN: There is an assessment of the landscape element.

804. MR STRACHAN QC (DfT): No, the townscape elements including, for example, the effect of putting vent shafts into conservation areas. We've looked at this in some detail in particular areas but there are assessments. You may not agree with them but there are assessments there, aren't there?

805. MR PILL: There are assessments.

806. MR STRACHAN QC (DfT): Thank you very much.

807. CHAIR: Mr McCracken, do you want to ask anything further?

808. MR MCCRACKEN: Yeah, I did just want to ask. I wanted to ask how significant the difference between GLVIA2 and GLVIA3 is in terms of the criticisms that you've made.

809. MR PILL: GLVIA does require… the third version requires more narrative generally. But, as I said, the draft version was available some time before it was actually published so people were aware of it in the profession and people knew it was coming in. The narrative and the transparency of how judgements and decisions are made needs to be spelt out. Before that, people used to do a lot more matrix based, very quick assessment. And GLVIA 3 is about telling people how you've come to your judgement.

810. MR MCCRACKEN: What about the criticism of the photo montages? Has that changed significantly between GLVIA 2 and 3?

811. MR PILL: No. The technical note came out some time before so that's…

812. MR MCCRACKEN: Yeah. Alright. Yes. Thank you very much.

813. We next turn to Jo Treweek, our ecologist. Slide 48. You're an ecologist with 25 years' experience in research and environmental impact assessment practice. You've contributed to national guidance on ecological impact assessment under the IEEM EcIA guidelines. That's the Institute of…?

814. MS TREWEEK: Ecology and Environmental Management. And they are the

guidelines that we use to conduct the ecological assessment of EcIA.

815. MR MCCRACKEN: And you designed the first version of the Defra biodiversity offset metric being used by HS2.

816. MS TREWEEK: I did indeed.

817. MR MCCRACKEN: And you've been instrumental in developing international standards and audits on large scale infrastructure projects on behalf of international finance institutions such as IFC and EBRD.

818. MS TREWEEK: That's the International Finance Corporation and the European Bank for Reconstruction and Development.

819. MR MCCRACKEN: And those have covered mining, oil, gas and linear infrastructure projects both in the European Union and Africa?

820. MS TREWEEK: Yeah.

821. MR MCCRACKEN: Okay. Well, now, slide 49 please. What does that show you?

822. SIR PETER BOTTOMLEY: We can read.

823. MS TREWEEK: You can read. The point is that there are very significant impacts from this project due to its scale and the sensitivity of the environments it goes through. And it's important when we get on to the discussion of no net loss to know what some of those are.

824. MR MCCRACKEN: Yeah. Now, we see a dead barn owl there unless it's sleeping. Do you know what proportion of the barn owl population would be on the route?

825. MS TREWEEK: Apparently 1% of the national population; 52 pairs. And it's identified as a permanent residual adverse effect.

826. MR MCCRACKEN: Okay. And next slide, 50. You made the point that ancient woodlands that are destroyed are not replaceable and that there are 32 sites and 30 hectares of ancient woodland?

827. MS TREWEEK: Yeah, there are actually different figures provided throughout the documentation but it's in the region of 30 sites. And I should emphasise that these are agreed by everyone to be irreplaceable national assets.

828. MR MCCRACKEN: And then you make the point that 500 kilometres of hedgerows will be destroyed and that it takes 10 years to grow and replace a hedgerow.

829. MS TREWEEK: To be fair, that's a precautionary estimate that HS2 have provided but it's an absolutely huge figure and includes unsurveyed hedgerows that may or may not be important. So it's another case where the evidence base for the baseline is not established for the full range of features that are affected.

830. MR MCCRACKEN: Now, the last point on this page; can you just explain why that matters?

831. MS TREWEEK: I've really just made that point, that without a strong evidence base or a baseline it's necessary to resort to precautionary… or the project's claimed to take a precautionary approach. But actually that could be serious risks to other irreplaceable features that have not even been identified at this point.

832. MR MCCRACKEN: Slide 51, if you would. Here you're saying what you think should happen here to project the ecology.

833. MS TREWEEK: I'm applying the bar that I would apply if auditing a major infrastructure project for a financial institution or a government or as part of an independent panel, which I'd done many times. And those international, well-accepted standards require net positive in certain situations where critical habitats are affected, those being the equivalent of priority habitats. So even if the project didn't decide to go for net positive overall, it should at least adopt a similar standard to other international projects when it comes to priority features, is my view.

834. MR MCCRACKEN: And that hasn't happened. What about the mitigation hierarchy of avoiding, reducing, restoring, offsetting to achieve no net loss?

835. MS TREWEEK: Right, there's a very good reason for this mitigation hierarchy being enshrined in international good practice, and that's because we need to avoid 'license to trash' which is where offsets are used when there hasn't been adequate

avoidance in the first place of important features. So in this case we're in a licence to trash scenario because there is not adequate evidence that enough effort was made to avoid things like ancient semi-natural woodlands which are irreplaceable and should be avoided. So we either have a strategic level review where avoidance should be possible to a greater degree or we have a detailed scheme that explains how good mitigation would be used to cope with the fact that those sites haven't been avoided; and neither of those things apply.

836. MR MCCRACKEN: Now, the next bullet point – the need to survey habitats in advance – you've already made, and it's important and, in a sense, obvious. But what about the next point you make: to achieve a connected landscape using well-designed wildlife crossings. Just explain why wildlife crossings are important.

837. MS TREWEEK: So this is a complete barrier. Animals will not be able to cross this railway without assistance unless they're a bird; and even birds and bats will have turbulence effects to deal with that will potentially expose them to collisions and mortality. The point is that the Lawton recommendations that the government follows by policy have been used to inform offsetting and mitigation but not sufficiently across the route. So I accept that efforts have been made to network habitats on one side of the railway route or the other but, looking at good practice for the numbers of crossings, which haven't been described in detail yet, there appear to be about one-tenth of the number of crossings there should be.

838. MR MCCRACKEN: So how many is that?

839. MS TREWEEK: I've been told approximately 16 are being looked at. That may not be the case but it's difficult to find the information.

840. SIR PETER BOTTOMLEY: This is in addition to the tunnelling?

841. MS TREWEEK: Yeah. And there's a lot of good design that has to go into wildlife crossings so that they work.

842. SIR PETER BOTTOMLEY: I understand that. But if anyone gets the impression that the only way that wildlife can cross the line of the route is on these 16 or whatever it is crossings, we should not forget that a lot of money is planned to go into tunnelling

so that the wildlife won't be disturbed.

843. MR MCCRACKEN: Obviously in the urban areas. Urban foxes will be able to go across the tunnel –

844. SIR PETER BOTTOMLEY: No, I wasn't thinking about –

845. MS TREWEEK: You're talking about culverts and wildlife tunnels. Yeah, there's hazy detail available on that at present. The point is that they have to be well designed in relation to the –

846. SIR PETER BOTTOMLEY: We appreciate that.

847. MS TREWEEK: Yeah. We haven't seen evidence so far.

848. MR MCCRACKEN: So no evidence that, even were they going to have a culvert, that it's going to be designed in such a way that it would take wildlife that might be able to take advantage of it?

849. MS TREWEEK: It may have been designed well. I haven't seen the evidence.

850. MR MCCRACKEN: Yeah, ok.

851. CHAIR: We have had a lot of discussion about this. This has come up repeatedly from Warwickshire all the way down about design of green bridges.

852. MR MCCRACKEN: We'll not labour the point although I may labour the point about the independent adjudicator.

853. MS TREWEEK: You're looking at about 1 kilometre on average instead of one every 15 kilometres as an approximate.

854. MR MCCRACKEN: Okay. Offset strategy. And what about offsetting outside the rail corridor?

855. MS TREWEEK: I want to see the offset strategy in particular partly because of my experience and knowledge about offsetting, and because the metric has been, shall I say, adjusted to deal with certain issues potentially inappropriately. I really want to make a very strong point regarding use of offsetting for irreplaceable impacts on

irreplaceable habitats. It doesn't matter how much offsetting you do, you cannot use offsetting on the ground to actually deal with that problem. The impacts are no off-settable; therefore offsetting cannot be used to deal with them. And at the moment the no net loss strategy of the project appears to depend on offsetting non-offsettable impacts which is not in line with –

856. MR MCCRACKEN: Yeah, so this comes back to your wildlife crossing point, as well, doesn't it, in the sense that if you can cross there'll be less impact in the first place.

857. MS TREWEEK: Yeah, it's more about appropriate use of offsetting in line with agreed principles.

858. MR MCCRACKEN: And then you say that the scheme as currently presented doesn't demonstrate that acceptable outcomes can be achieved, as it were, through independent transparent accounting, monitoring and reporting.

859. MS TREWEEK: That's true, yeah.

860. MR MCCRACKEN: Now, you have some comments about the Environmental Statement and the information papers and so on in slide 52 if you can turn to that.

861. MS TREWEEK: I think people can probably read that for themselves. The point is that it is very difficult to see the wood for the trees in this ecological work. And again it's a paper chase and a bit of a challenge to find where all the commitments actually are. There's a lot of content in the statement that says no net loss will be achieved other than appropriate avoidance has taken place. But the evidence for that isn't presented.

862. MR MCCRACKEN: Okay. And we've already this afternoon touched upon the absence of a commitment to achieve no net loss as opposed to an aspiration to do so.

863. MS TREWEEK: Yeah, so I'm very trained in my auditing role to look for 'get out clauses' along the lines of 'strive to achieve' and 'make reasonable efforts to if feasible', etc. And I find most of the commitments are made in those forms of words.

864. MR MCCRACKEN: Yeah. And then we notice the next bullet point, 'compliance where appropriate with other relevant major conservation policy'. How do you characterise that?

865. MS TREWEEK: Well, that implies to me that there isn't a commitment to follow policy in all cases. Either it's always appropriate to follow it, in which case the statement does need to be made, or not all policy is going to be followed.

866. MR MCCRACKEN: Yeah, okay. Thank you. And you've already made your point about priority species. So let's just look at the context for all of this in slide 53, if we can.

867. MS TREWEEK: So what this slide says is that there's a recent paper that's come out from the Centre for Ecology and Hydrology which just emphasises the fact that we do have an ongoing and serious decline in biodiversity in this country and in existing services such as pollination on which we require for our wellbeing. And therefore commitments do need to be genuine and serious and result in action on the ground, not just aspirational statements; otherwise the situation is not going to change.

868. MR MCCRACKEN: Now, I'm just intrigued by this graph you've got. 1968, which is an important date in the world, in Europe anyway. You've taken 100 as your baseline.

869. MS TREWEEK: This is an index used in a paper to show decline in population, species richness and population abundance over time; and it's really just an illustrative –

870. MR MCCRACKEN: But I just want to make sure I understand it because it seems that we've lost four-fifths of our population over that period of 40 years.

871. MS TREWEEK: The point is that if you take into account the abundance of population as well as the number of species that are represented, you get quite a serious picture. And although some UK indicators are stable at the moment, there are others that are still in decline; and that includes farmland and woodland birds, for example.

872. MR MCCRACKEN: CEH, which is your source for some of this, what does that stand for?

873. MS TREWEEK: Centre for Ecology and Hydrology.

874. MR MCCRACKEN: Right.

875. MS TREWEEK: It's a well-respected research institute.

876. MR MCCRACKEN: Yeah. Then slide 54. Basically you there set out a number of documents and policy statements that suggest that the no net loss should be what we are securing in project.

877. MS TREWEEK: Yeah, and it's a minimal requirement. It's a bit like stopping climate change. And it arises out of the Convention on Biological Diversity and EU policy. And we are, as a nation, signed up to that commitment.

878. MR MCCRACKEN: But we see that Defra goes a little bit further: 'We will move progressively from net biodiversity loss to net gain.' So that's not no net loss; that's actually wanting to achieve gain.

879. MS TREWEEK: Yeah, because we have a legacy of historic decline to deal with.

880. MR MCCRACKEN: Alright. And then you set out on slide 55 the various things that you have to think about. 'Negative impacts' there presumably are adverse impacts.

881. MS TREWEEK: Yeah, I wasn't sure how familiar everyone is with what no net loss is so I don't want to insult you in any way. It's just to show how in a normal project design you go from an adverse impact to efforts to avoid, efforts to minimise. And then if you can't do that you then look at how you might offset any residual impact. And that's what HS2 has, in their slightly wishy-washy way, stated a partial commitment to. But the problem is that the outcome depends on inappropriate use of offsetting, in my view.

882. MR MCCRACKEN: Alright. Now, let's now look at how HS2's commitments stack up against accepted principles of no net loss.

883. MS TREWEEK: Right. So whatever way you look at it, there's a residual loss of ancient semi-natural woodland, and that has to be taken on the nose as a residual adverse impact that can't be offset.

884. MR MCCRACKEN: That's just going to happen, yeah.

885. MS TREWEEK: So trading up would then be appropriate but also efforts to look at individual species and make sure that… Just to explain the Defra metric was always intended to be an initial minimum tool to identify what's the land area you need to be

able to get no net loss of biodiversity, looking at the broad habitats represented. However, what it doesn't do is deliver you no net loss as a species level because that requires efforts to actually understand the populations of the priority species and how they're working in the landscape. And it's that level of detail that, so far, hasn't been built into the offset strategy.

886. MR MCCRACKEN: Okay. And then?

887. MS TREWEEK: And then another very important thing is that if you look at a species level and you look at things like noise emissions from the railway, there's a lot of evidence to show that you get depression of animal populations within a zone of noise impact from linear infrastructure. And in this case the project has constrained to delivering its offsets within the corridor that includes that zone that's affected and disturbed by noise, which automatically reduces its value. So the fact that offset provision is confined within a railway route means that the gains that can be claimed have to be looked at in the context of the impacts that the project will have.

888. MR MCCRACKEN: I mean, to put it bluntly, will offset actually work if it's in the confined railway corridor?

889. MS TREWEEK: So for some species it will work; for other species it won't work. To get the level of trading up that's required to deal with the fact that there are residual impacts on woodlands, hedgerows and other important habitats, I would suggest means at least looking at the ability of the land to provide the offsets that are needed. Is it suitable quality? Is it suitable type? Can it actually deliver the outcome that's required or is it necessary to go outside that corridor and trade up, looking at higher conservation priority?

890. MR MCCRACKEN: Would you expect with a linear project of this sort that the developer would actually be looking to offset outside the railway corridor as opposed to confining itself –

891. MS TREWEEK: I've never seen a project where the offset is confined within the corridor or the concession area of the project.

892. MR MCCRACKEN: Before this one?

893. MS TREWEEK: You have to go where it's appropriate to go to get the biodiversity outcome that you need to get.

894. MR MCCRACKEN: But you have done now.

895. MS TREWEEK: I know but it's not good practice to do that.

896. MR MCCRACKEN: Okay, let's turn to the practical steps to minimise HS2's impacts on wildlife. And you said that HS2 is committed to few, if any, verifiable measures to mitigate wildlife impact. And if it was serious it would… and then list a number of things. So the first thing are crossings.

897. MS TREWEEK: Yeah, we've touched on crossings. So I think the point here, again, is we're moving to detailed design. We need to see how many crossings are proposed and we need to understand what's been done to manage mortality impacts on animals and to understand the population level implications of that mortality in slightly more detailed terms than just 'this is 1% of the country's barn owls'. We need to know a little bit more exactly what the outcome might be.

898. MR MCCRACKEN: And you also explained that species need time to adapt to crossings or they won't use them. And then you also mention reducing animal mortality by discouraging foraging on adjacent verges. I mean, that seems in one sense fairly obvious but is that actually being done?

899. MS TREWEEK: Well, this is where the detail is a little bit lacking. So in some places gains are referred to in terms of habitat along the route. That would have to be managed carefully not to lure wildlife into a risky situation. But the way the route is fenced along a lot of its alignment and where noise barriers are used, nothing would be able to get on to the route anyway. It's just a question of making sure that this is designed in detailed.

900. MR MCCRACKEN: Well, you say nothing can get on the route. I mean, a bird can obviously fly in front of a train if it chooses to, can't it?

901. MS TREWEEK: It won't if there's no food to go for.

902. MR MCCRACKEN: Alright. 'Suitable linear habitat can be created

perpendicular to tracks to lure target species away.' Again, this is off-line, as it were, which is not envisaged –

903. MS TREWEEK: Yeah, and it may be happening and there may be a lot of detailed design work going on that we haven't seen. But at the moment this detailed mitigation is important because it affects the offset requirement at the end of the day. And before you get to offsetting you'd expect to see enough detail about the mitigation to know what the residual impact will actually be. And if you jump the gun and go directly to offsetting without doing that first, you're breaking the offsetting rules.

904. MR MCCRACKEN: Yeah, and you repeat the point – or rather you summarise the point – that you need a full assessment before you start which we haven't got. And you want a clear commitment to no net loss in the environmental memorandum with a net gain for priority habitats. Now, you've got a lot of experience working for banks and promoters of projects. Is it reasonably practicable to give a clear commitment to no net loss in your judgement?

905. MS TREWEEK: Well, either you commit or you don't commit. But you don't half commit.

906. MR MCCRACKEN: But is it reasonably practicable to ask them to make that commitment?

907. MS TREWEEK: Well, every project I work on for the World Bank, the International Finance Corporation or EBRD requires that commitment of their clients. It's a standard requirement.

908. MR MCCRACKEN: Thank you. And then you want best practice standards implemented for mitigating ecological impacts from long linear structures such as wildlife crossings. And in accordance with this House of Commons Environmental Audit Committee report of April 2014, a process to monitor all aspects of environmental protection including biodiversity, mitigations, compensation and offset. And best practice guidelines agreed by a publically accountable ecological review group. Any sign of that at the moment?

909. MS TREWEEK: I don't believe so.

910. MR MCCRACKEN: How important is a publically accountable ecological review group?

911. CHAIR: These are very busy slides and you've still got quite a few to go. Can you…?

912. MS TREWEEK: No, that's the last slide.

913. MR MCCRACKEN: And it's probably quite a convenient moment for me to turn to Mr Strachan; or you, sir, can indicate that Ms Treweek is available to answer questions but obviously –

914. CHAIR: I'm also conscious she's got to catch a plane as well. Do you have any questions, Mr Strachan?

915. MR STRACHAN QC (DfT): Well, I know you've looked at a lot of this before. I was just going to show you P15756(1) and (2). The Committee has already heard evidence about this, Ms Treweek, but the position that we summarised on the slides which appeared earlier on in the Committee process is that, as a matter of fact, there isn't a policy requirement for individual projects to achieve no net loss or indeed net gain. And we've identified the relevant policy framework, I think, on a number of occasions.

916. MS TREWEEK: No, that's true. What I was saying was that it's accepted international good practice and it's a policy obligation.

917. MR STRACHAN QC (DfT): Well, can I just take you on to slide 2 then because you can see what Defra actually said to the Environmental Audit Committee, although it's probably outside the remit of this Committee. But what they actually said was acknowledging 'the objective of seeking no net loss biodiversity is very challenging for a major infrastructure project such as HS2' and that 'this aim is as ambitious as for any similar infrastructure project worldwide'. So it is an objective of no net loss rather than a commitment but it is as challenging or as ambitious, according to Defra, as for any project worldwide.

918. SIR PETER BOTTOMLEY: The petitioners, and in effect their witness, weren't asking for what's being given. They were saying that it would be better to go for

something better. We understand what you're saying.

919. MR STRACHAN QC (DfT): It's just we looked at what Defra had said on another occasions. Defra have specifically commented on –

920. MS TREWEEK: It's challenging because it's a massive project that's causing a complete barrier over hundreds of miles of biodiversity rich countryside.

921. MR STRACHAN QC (DfT): Right, well –

922. MR MCCRACKEN: What is your experience –

923. SIR PETER BOTTOMLEY: We've heard …

924. MR STRACHAN QC (DfT): Shall I –

925. SIR PETER BOTTOMLEY: We've heard her experience.

926. MR MCCRACKEN: Yes. I was going –

927. MR STRACHAN QC (DfT): Conscious of your need to catch a plane, I will be responding to cover some of these points in some remarks but I don't need to ask any more questions.

928. SIR PETER BOTTOMLEY: The interrogative rhetorical point has been made.

929. MR STRACHAN QC (DfT): Indeed.

930. MR MCCRACKEN: I think we have three minutes so it would be helpful to have as many of those points as possible while she's here and has an opportunity to respond to them.

931. SIR PETER BOTTOMLEY: I don't think that's quite the way it works but thank you.

932. MS TREWEEK: Thanks very much.

933. CHAIR: Do you want to make a brief last point before you fly off to Scotland?

934. SIR PETER BOTTOMLEY: Goodbye.

935. MS TREWEEK: I just applaud the efforts that this has to be done well.

936. CHAIR: Okay. Well, we have everything on slides so we can see your evidence. Thank you very much indeed and sorry it's taken so long to get to you.

937. MR MCCRACKEN: You indicated, sir, or your clerk indicated, that you'd take a break at –

938. CHAIR: Well, I think we'd like to get your last witness out of the way. Do you have one more?

939. MR MCCRACKEN: We've got two more, I think. We've got trees and we've got waste. Then, of course, Mr Strachan's indicated he's coming back with some stuff.

940. CHAIR: Yeah. I think we carry on for the time being otherwise we're going to be here all night.

941. MR MCCRACKEN: Very well.

942. SIR PETER BOTTOMLEY: I think if you speed it up. There'll be no net loss to our understanding.

943. CHAIR: I think you've just hit the record for witnesses in two years.

944. SIR PETER BOTTOMLEY: But they're good witnesses.

945. MR MCCRACKEN: Yes, I think they are.

946. SIR PETER BOTTOMLEY: Who's going next?

947. MR MCCRACKEN: It's Mr Berry, the tree man.

948. SIR PETER BOTTOMLEY: Slide 59.

949. MR MCCRACKEN: And I hope you'll forgive the slight discourtesy by introducing him before he's sitting down. You're Jonathan Berry. You're a chartered landscape architect, professional arboricultural consultant –

950. SIR PETER BOTTOMLEY: We can read that.

951. MR MCCRACKEN: Yes, very well. So let's turn to slide 61 where we see first of all a point that can be readily seen by the Committee – there's no commitment to comply with BS 5837, recommendations on –

952. SIR PETER BOTTOMLEY: Would it be helpful… would you let me be helpful and say could you look at slide 67, please? The case is those deficiencies. These are I think what's being suggested to the Committee would mitigate, moderate or get things right. I think if you would talk through those it would be quite good and quite appropriate.

953. MR MCCRACKEN: Right, so running through those: 'Commitment to undertake full baseline arboricultural survey in accordance with the provisions of BS 5837'.

954. MR BERRY: That's correct.

955. MR MCCRACKEN: Any sign of that commitment so far?

956. MR BERRY: No, it's not clear. From my perspective as a professional, with a strategic scheme of this size I would expect to see baseline surveys of trees, even if based on broad parameters at this stage. And there's nothing in the ES which I've been able to find which represents that baseline survey.

957. MR MCCRACKEN: Okay. 'Arboricultural impact assessment to determine the accurate extent of tree loss and the production of tree protection strategies in the form of AMS.' Any sign of that so far?

958. MR BERRY: No. Again, no observations. It is a point of detail and will come through as detailed design. But there's very little piece of mind given at the moment that trees will be protected during the construction and build process, both in the operational corridor and off-site in relation to construction compounds and the like. So nothing that I can see at the moment in the documentation that deals with that.

959. MR STRACHAN QC (DfT): I know you want to go through the slides quickly, but can I just refer the Committee to the Code of Construction Practice, section 12.2? It deals with the protection of trees including, for example, 'where individual stands of trees require felling that the requirement for felling was not identified with the BS, the nominated undertaker's contractor will undertake an arboricultural assessment by

appropriately qualified specialists and, where necessary, appropriate mitigation should be employed'.

960. 12.2.2: 'Retained trees will be protected in line with the recommendations in "BS 5837: Trees in relation to design, demolition and construction".'

961. 12.2.3 sets out a whole list of measures to be implemented in terms of practice in dealing with trees and compliance, not just with the British Standard 5837 but also British Standard 3998.

962. MR MCCRACKEN: So do we take that –

963. SIR PETER BOTTOMLEY: In effect that's supposed to be the equivalent of AMS rather than the AIA?

964. MR STRACHAN QC (DfT): Yes. I think if one reads 12.2.2 in relation to the protection of trees, whilst it may not replicate everything in the ask, our position is that it substantially reflects appropriate protection for trees in the detailed design and construction of this project.

965. MR MCCRACKEN: I want to understand whether this is a commitment to carry out full baseline arboricultural surveys or not.

966. SIR PETER BOTTOMLEY: I think the way I interpreted it was more to the Arboricultural Methods Statement of the Code of Construction Practice rather than the Arboricultural Impact Assessments, which certainly can't be done now.

967. MR BERRY: No, that's correct. I mean, the problem I have now with the information at the moment is that until you understand that baseline scenario in terms of trees and what trees are exactly at risk in relation to a range of operations over different phases, how can you begin to understand the tree protection measures? Tree protection strategies, AMS works, even for basic, small residential plot sites can often be 20 or 30 pages of detail. At the moment there's very little baseline information with relation to trees that give me the peace of mind when reading through the ES that trees are being treated seriously as environmental and amenity assets and that they would be protected adequately during the process.

968. SIR PETER BOTTOMLEY: If you knew as much as we know about an old pear tree halfway along the route, you wouldn't have said it quite that way. Can we move on to the next point please?

969. MR MCCRACKEN: Yeah. We'll accept in relation to that one pear tree of course that point doesn't apply. Point 3: 'Targeted amenity valuation tree surveys undertaken to enable the cost-benefit analysis of the final route option.'

970. SIR PETER BOTTOMLEY: That may or may not be correct but the House of Commons by second reading has approved the route and we're looking at possible petitions on –

971. MR MCCRACKEN: Approved the broad route but with, I mean, the possibility within the broad route of minor changes that might save important trees.

972. MR BERRY: Yes. I mean, the recent information I read said that in terms of tolerance there's still a cost-benefit analysis approach to be taken where if an amenity valuation of a particular tree is undertaken – for example a mature standing tree could be £150,000 - £200,000 value – it's important to have that information there for decision makers to make that call.

973. MR MCCRACKEN: Can I also just ask you: are we concerned only with trees on the actual route that the rails pass through, or are we also concerned with trees on haul routes and such like?

974. MR BERRY: Yeah, there's just as much likelihood of damaging trees to be retained on haul routes, construction compounds and off-site locations.

975. MR MCCRACKEN: Okay. And then item 4. This is rather important, I think.

976. MR BERRY: Item 4 in relation to the production, delivery and implementation strategy. In terms of the tree mitigation, obviously as an arborist I welcome the delivery of two million trees. Fantastic opportunity to deliver some great new woodland habitats. I feel that there's a real need for a delivery and implementation strategy to demonstrate exactly how, firstly, the planting will be phased and also how it will be designed, secured, procured, propagated and obviously delivered to these different phases. It is a very complex process and procedure. There are elements of the scheme where it's been

promised that seed stock from some of the ancient woodlands will be used to propagate trees. Obviously that requires research and time. So it's an understanding of that process and whether anything has been undertaken to date to make sure there's a mechanism in place for people to actually monitor that it will successfully implement these two million trees.

977. MR MCCRACKEN: Can we just go back to slide 61 for a moment? And the second point in slide 61. Latest iteration of British Standard applies much greater focus on the need to consider site planning, suitability of tree species, social proximity and future growth, etc., and ongoing management. Have you seen anything that indicates that the approach to the two million trees will adequately deal with the importance of providing trees that fit in to their immediate surroundings?

978. MR BERRY: Not at this stage, no. I mean, obviously the adage of 'right tree, right place' is key here. For the mitigation and these two million trees to be successful you've got to have the right location, the right species –

979. SIR PETER BOTTOMLEY: We've got that point, I think.

980. MR MCCRACKEN: Very well. And then finally point 5: independent regulatory body with clear definition of scope, powers and objectives. Well, I rather laboured that point.

981. 6: additional information regarding the ongoing legal protection of all the implemented HS2 mitigation planting. I think we've covered that point previously, haven't we?

982. MR BERRY: That's correct, yeah.

983. MR MCCRACKEN: Okay. And in terms of delivery of those trees, I think you expressed some concern, or rather the horticultural industry expressed some concern – slide 64 – as to whether the planting demands associated with Phase I could be met.

984. MR BERRY: That's correct. At the end of 2015 the industry said this is a huge demand upon the industry. There's obviously promise from HS2 to deliver largely native stock sourced from the UK. And, again, it's looking at the complexity of that, the order lines, the procurement and where that's been considered. Obviously also issues of

biosecurity, which no doubt have been before the Committee before, and things like ash dieback. Are we going to be excluding ash completely from the mix? Are we going to be importing disease-tolerant stock from Scandinavia to deal with the problem?

985. MR MCCRACKEN: Talking about importing, how did ash dieback get into Britain?

986. MR BERRY: Yeah, it's imported stock but it's through controls. You obviously have a control mechanism for bringing stock into the country which is deemed to be disease free effectively. So there are mechanisms for doing that. At the moment there just isn't the visibility and transparency for someone like me to say 'yes, the UK horticultural industry can provide this stock over this timeframe over these phases to this quality'.

987. MR MCCRACKEN: Right. Well slide 67 sets out the things that you're asking for and I'll ask you to wait there in case there are any questions, or perhaps indications that those things will be offered.

988. MR CLIFTON-BROWN: Can I ask one simple question? Did you study HS1?

989. MR BERRY: I didn't study it but I'm aware of it, yeah.

990. MR CLIFTON-BROWN: Did we do well in terms of trees or not in that construction?

991. MR BERRY: The articles and some of the scientific journals I've read say that the longevity of some of the trees that were planted were poor so survival rate wasn't great; so the amount of replanting that's been required has been significant. For those sorts of strategic schemes, a failure of 20 to 30% of tree stock in the first five years is typical. So areas of planting haven't been realised as perhaps the original vision was sold to people. But obviously there is tree planting associated with it and some of that will thrive and will help to blend the scheme into the landscape over time.

992. MR CLIFTON-BROWN: Okay.

993. CHAIR: Do you have any questions?

994. MR STRACHAN QC (DfT): No, I can deal with it by response.

995. CHAIR: Thank you. I could just stress that we have the promoter's witnesses. You can cross-examine. If any of your witnesses want to sit next to you when you're cross-examining they can, but we don't have all the witnesses again.

996. MR MCCRACKEN: Well, in that case the fair way would be for Mr Strachan to put points to my witnesses and any other approach –

997. SIR PETER BOTTOMLEY: I –

998. MR MCCRACKEN: With respect, I accept your ruling, of course –

999. SIR PETER BOTTOMLEY: In that case you can stop.

1000. CHAIR: It's the procedure of the Committee and that's the way we've always done things. I know it's your first time before the Committee. But we have all the information here.

1001. MR MCCRACKEN: Sir, I entirely accept it. I need to place on the record that I consider that an unfair procedure but I simply say that for the sake of the record; it's not to seek to invite you to change your ruling. Thank you.

1002. CHAIR: If we'd done that throughout the last 18 months, we'd be here for another 12 months.

1003. MR MCCRACKEN: Well, we have suggested that a topic-based approach should have been taken rather than a petitioner-based approach. And while I respect the decision –

1004. SIR PETER BOTTOMLEY: Thank you. You've got one more witness to come.

1005. MR MCCRACKEN: Yes. Waste, indeed. I make all my points with respect but they need to be on the record.

1006. CHAIR: Okay.

1007. SIR PETER BOTTOMLEY: Only once.

1008. MR MCCRACKEN: So be it. Right. You're Nigel Cronin. You have a Master's in Business Administration. You've had –

1009. SIR PETER BOTTOMLEY: We can read this.

1010. MR MCCRACKEN: Very well. Okay. Let's have a look at the headline numbers.

1011. SIR PETER BOTTOMLEY: Page 89 is probably a good page to be looking at.

1012. MR MCCRACKEN: Slide 89. These are your recommendations. Okay, run through them if you would.

1013. MR CRONIN: Okay. There are three points there following our review of the approach to waste management on HS2. That it appears that we have failed to secure a full assessment of alternative management options in line with the waste hierarchy. I think that's within the slide. People have seen that in terms of minimisation, re-use, recovery.

1014. MR MCCRACKEN: That's slide 83, is it?

1015. MR CRONIN: Yeah.

1016. MR MCCRACKEN: The hierarchy which tells you start by preventing; then you minimise; then you re-use; then you recycle; then you recover; and only finally do you dispose.

1017. MR CRONIN: Yeah. And I think the point about that recommendation is that there appears to be a strong affinity to select landfill as the desired option for a significant amount of material – almost 18 million tonnes – without any evidence that we've really secured any of the others. I accept the position that the SPA – the sustainable placement areas – are included within the scheme. But it's also true to say that that appears to be a very quick route to disposal by another means in any way, shape or form. I think that is landfill or land-raising; as a planning authority you call it by any other description.

1018. MR MCCRACKEN: How does it compare to a slagheap?

1019. MR CRONIN: I think the conversation around this is the fact that an SPA, unless it's been fully assessed in terms of its potential impact on the landscape in terms of flood management, ecology, all of those things don't appear to have been undertaken to

a level of degree that I would have expected.

1020. SIR PETER BOTTOMLEY: Okay. I think the sooner we get back to page 89, the better. Witnesses have been helpful to us but they may not know that we've been going through some of these under different words with different people in different months over different years.

1021. MR MCCRACKEN: The second point on page 89.

1022. MR CRONIN: Yeah, the second point is we'd recommend that HS2 conducts a detailed assessment of options for the recovery of waste and landfill capacity. There's a general assumption in the document in terms of waste management that the market for all of this material exists out there.

1023. SIR PETER BOTTOMLEY: Who will take it at what price? Which way?

1024. MR CRONIN: Well, I think the basic premise of the conclusions of HS2 is that they've had a look at the standard Defra waste interrogator numbers and come up with a market capacity. The difficulty is that what that doesn't show you is that the availability of that capacity now, in very simple terms so that we'll all understand it, is you may well have a sand a gravel quarry in Surrey that is currently consented for 3 million metres of inner landfill as part of its restoration obligation but the sand and gravel hasn't come out yet; it's just part of this scheme. So until that quarry has been worked –

1025. SIR PETER BOTTOMLEY: I think we appreciate that.

1026. MR CRONIN: Right, okay. So that's our point; and our assessment of that is that even if you go along with the idea that the landfill capacity is only within the five regions affected by the scheme, you're going to take it all up in one go. And I think that has some significance on the future construction / demolition market in the whole of those regions.

1027. MR MCCRACKEN: And then your third point?

1028. MR CRONIN: The third point is there's, I think, a need for more detail about material flows up and down the line. I think there are a number of statements in the document that don't give me the level of confidence at the start of a project that I'd

expect to see. Examples of those are the two CFAs 17 and 15.

1029. MR MCCRACKEN: That's slide 88?

1030. MR CRONIN: Slide 88. They generate, between them, around 22.7 million metres of material. There's an expectation and acceptance within the design that those materials are going to be beneficially reused. Unfortunately the wording says things like the majority of excavated materials is expected to be suitable. If you get that wrong by 10%, then all of a sudden you're starting to talk about an additional 113,000 HGV movements just on those two CFAs alone. So I just think that's an element of waste that I'd like to understand better.

1031. MR MCCRACKEN: So, just so I understand that, if you're right about it being a majority and the majority turns out to be 90%, you'd still have 113,000 extra HGV movements?

1032. MR CRONIN: Yes.

1033. MR MCCRACKEN: And if the majority turned out to be 80% it would be 226,000 HGV movements and so on and so forth?

1034. MR CRONIN: Yeah.

1035. MR MCCRACKEN: Thank you.

1036. MR CRONIN: So going back to slide 89, I think the concern we have at the moment is that until you get a better appreciation of what the market is going to allow you to export within the five regions, I don't see how you can remotely assess the environmental impact of trucking all of that material to suitable disposal points.

1037. MR MCCRACKEN: Just going back to slide 86 if we can for a moment, you there point out that the recent change within HS2 – SES3 and AP4 – require almost a four-fold increase in the original quantity of surplus excavated waste. So it goes from 5 million up to 14.5 million.

1038. MR CRONIN: Yeah.

1039. MR MCCRACKEN: And HS2 has characterised this as a 'minor adverse effect'.

But if you're increasing by 9.5 million tonnes, how many HGV movements are you talking about there, broadly speaking?

1040. MR CRONIN: That's going to be… I need a calculator.

1041. MR MCCRACKEN: Okay. But I mean 2.2 million tonnes was 113,000.

1042. SIR PETER BOTTOMLEY: We're trying to avoid this kind of element of the discussion. I think the recommendations are ones which we can understand. The calculations we are capable of doing. And I think the sooner we get to the conclusion of this part of your case, the better.

1043. MR CRONIN: Fine.

1044. MR MCCRACKEN: Okay. Well, would you agree that that's only a minor adverse effect?

1045. MR CRONIN: No, I just can't see it is because if you're starting to move all of that material and there's no evidence that it's going to be anything other than by HGV movements along that route, then I can't believe that local communities within the vicinity of that line are going to consider that a minor adverse impact.

1046. MR MCCRACKEN: Thank you very much. I think we've had a strong hint that we should draw a line under it there and invite questions from Mr Strachan and the Committee.

1047. CHAIR: Mr Strachan?

1048. MR STRACHAN QC (DfT): I can deal with this by way of response.

1049. CHAIR: Okay. Thank you very much indeed.

1050. MR MCCRACKEN: I think in that case can I just quickly finish? I didn't cover all the slides that we had.

1051. SIR PETER BOTTOMLEY: You weren't expected to.

1052. MR MCCRACKEN: I'm sorry.

1053. SIR PETER BOTTOMLEY: You weren't expected to. And we have read the lines from your supporters on page 90, which were grateful.

1054. MR MCCRACKEN: Yes, so I don't need to cover those. I simply thank the Committee for its courtesy and in particular for its helpful questions which have enabled useful clarification. And can I thank the administration for their prompt and efficient display of the slides.

1055. CHAIR: It generally works well. It hasn't always but it generally works well. Mr Strachan?

1056. MR STRACHAN QC (DfT): Yes. I'm going to, unless you tell me otherwise, try and cover the topics as they arose. And I'm conscious of just some points of detail to cover with witnesses. So I'm going to ask Mr Smart to go back and deal with rail operation. I'll come back and deal with the independent adjudicator as a last point.

1057. But can I just ask Mr Smart to address you on points raised by Mr Connor about the operation of HS2? And I can probably do it best by putting up Mr Connor's slide, A2068(17). And there were just a number of topics to address, Mr Smart. Mr Connor made some comments about acceleration and braking. What assumptions are being used for HS2. And I understood the broad thrust of what he was getting at: the consequential effect on the headway calculations and capacity of the line. Can I just ask you to take those things in turn? First of all, acceleration and braking calculations for the purposes of HS2.

1058. MR SMART: Yes. Well, I don't disagree with some of what Mr Connor said in terms of his headway. He's right that of course we have to have a headway. I'll come back to the acceleration because that's probably less important in terms of the submissions the petitioners have made.

1059. So I think Mr Connor was suggesting there would be a greater capacity if we went at a slower speed, which isn't really quite as significant as he has suggested. There has to be a headway between trains in order to stop trains. There is a technical headway which is effectively the stopping distance in terms of braking and there's a buffer zone, which basically is the response time of the signalling or indeed the driver to react to the signalling. And on top of that there is what is known as an operational headway, which

takes account of other factors such as traction power, driver, response, dwell time, etc.

1060. Now, when you look at just the pure technical headway, if we were just to send trains down HS2, we would probably get in the order of 29 to 30 trains an hour. But, of course, that isn't practical when you look at what actually happens. And that's how we end up with what we call an operational issue or timetable of 18 train paths per hour. And we achieve that by the fact that the modern signalling systems – the European train control system – has a better response time and therefore reduces the buffer time to allow the signalling intervention, and how we manage the other issues around what we call the operational headway.

1061. Now, the braking characteristic referred to by the petitioners, we actually use a figure of around about 0.4 metres per second squared when we're in general operational mode on the two track railway. Where we go to the higher value, which is where frictional braking effectively comes in, of around 0.67 metres per second squared, is for either perturbation but, more importantly, at lower speeds. One of the factors that reduces capacity is when you're having to slow down to come out of stations. So what we tend to do is we use the higher speeds to come into stations and approach the buffer stops, and use the higher braking rate to then bring the train speed down.

1062. So what you actually have to do is do a proper modelling of this, and that is what we've done, which takes account of all the factors of the railway: the speed, the braking distances, all sorts of other factors such as the gradient. And you model all of that and we have modelled them that we can achieve the 18 trains per hour. And because of the dynamics of our railway, if we go at slower speeds there isn't actually a significant effect on the number of train paths that we can get. And, of course, the downside of that is that you're not getting the distances that the speed gives you. And I should also add that, although to a certain extent one could see that you could reduce the headway by going at a slower speed because the trains of course need less time to stop, that is to a certain extent balanced by the fact that because the trains are travelling faster they're actually moving faster along the line anyway. So if you put all that into perspective, it really means that we aren't using the braking speeds as high as 0.67 metres per second squared in basic scenarios on the railway, and we can achieve the headways that we have stated that we need to do for the railway.

1063. MR STRACHAN QC (DfT): On that point, Mr Smart, I referred to the Volume 3 route-wide assessment where there's an assessment of alternative train speeds which we had up on screen. There's also Volume 5, technical appendix C, alternatives report, R1317. And, Mr Smart, I'm sure you don't need to go through it all but if we just get that up on screen. This is part of the Environmental Statement. Technical appendices, alternatives report, section 5, R1317. But that includes an assessment of –

1064. MR MCCRACKEN: Can you wait until it's on screen?

1065. MR CLIFTON-BROWN: While we're waiting, Mr Smart, in terms of safety, how is the separation between trains governed? Is it governed by human interpretation by the driver? Is it governed by the controller? Or is there some automatic mechanism that stops trains getting too close?

1066. MR SMART: There's an automatic mechanism which intervenes on the train. Now, the question then is whether there will be automatic train control which will bring the train down to… basically control the train. Yes, that's what will happen. There's also full train control where basically that takes a more expansive role on the train. But there is an intervention via the signalling system which if the driver is moving too fast there will be an intervention which brings the train down to stop the train. But in between that, if that's not been acceded, then the driver has got control and will be driving to optimise performance and the timetable. And, depending on what sort of train control depends on what indications the driver might get. But he's in cab; he's not looking at colour lights. At these speeds you can't do that, that's why it's in cab. So he'd be looking at speeds in the cab.

1067. MR CLIFTON-BROWN: And with these sorts of braking speeds that you're talking about, what is the minimum separation that is envisaged?

1068. MR SMART: Well, for your stopping distance you'd be talking a distance of about 10,000 metres. Something like that. Plus the buffer zone. And that depends on the response time of the signalling system. And then you've got to allow for the 400 metre trains. So you've probably got, by the time that all adds up, another couple of thousand metres on my 10,000 metres and then you've got the length of the train of 400 metres. So you're looking at a couple of kilometres.

1069. MR CLIFTON-BROWN: And is that factoring in the 18 train paths per hour?

1070. MR SMART: That is the factor. But of course that's only what we call the technical headway, and so that in HS2 terms is 140 seconds roughly, which is what you need to actually stop the trains to do your safety intervention. But we have an operational timetable of around three minutes which takes into account all the other things: the fact that the train might not be going at the optimal speed; there's dwell times coming in and out of stations; box times when they've stopped; they might be slightly different in terms of their arriving time. So we actually plan on a three minute headway for operational planning. But for safety reasons you need the 140 seconds to stop a train without hitting the other one.

1071. MR STRACHAN QC (DfT): But the short point, as I understood your answer, Mr Smart… or perhaps I can ask you the question: would reducing speeds from 360 down to 300 actually generate more practical capacity on this section of the line?

1072. MR SMART: When you model it, we have found that it's not significant. So you might get one or two train paths potentially, but what you would lose then of course on the capacity is the distance that you're travelling. So it's a balance that you have strike and we believe that we have got the best balance.

1073. MR STRACHAN QC (DfT): The alternatives report is up on screen. Mr Smart, you can point out any relevant part. But just so the Committee gets the structure, conventional speed assessments were looked at as part of options for developing a new route. We can go down.

1074. MR SMART: You can see the benefits that were looked at in terms of carbon emissions, greater flexibility and lower noise impact.

1075. MR MCCRACKEN: Can I just be sure? I thought I saw 200 kilometres per hour, not 300 kilometres per hour.

1076. MR STRACHAN QC (DfT): Correct; I'm just getting that. Conventional speeds at 200 kilometres an hour. If we carry on further down, higher design speed. And then reducing design speeds locally to mitigate adverse environmental effects. And you can see various study areas looked at where you might reduce to different speeds on

different parts of the alignment. And if you carry on, also alternative routes at 300 kilometres per hour.

1077. MR SMART: Yeah.

1078. MR MCCRACKEN: Can I just follow what's being shown? Those are alternative routes as opposed to alternative speeds on the existing route?

1079. MR STRACHAN QC (DfT): Yes, those were the alternative routes which were also looked at at 300 kilometres per hour.

1080. MR MCCRACKEN: I'm just trying to work out where this deals with what we're suggesting, because none of the things we've looked at so far do.

1081. MR STRACHAN QC (DfT): Well, just go up the screen please again.

1082. MR SMART: What this is looking at is what benefits will come from 300.

1083. MR HENDRICK: No, I think the question was about the braking acceleration. There's a difference obviously between the 5 and the 6.7 that you were putting forward.

1084. MR SMART: Yes.

1085. MR HENDRICK: I know you tried to describe it with a fairly long explanation but could you put in a nutshell how you get to 6.7?

1086. MR SMART: Yes. In a nutshell we don't use 0.67. We use 0.67 in perturbation and in certain circumstances when we're coming into switches and crosses coming to stations. We average at 0.4 meters per second squared, which I think is –

1087. MR HENDRICK: Which is less than the 5 –

1088. SIR PETER BOTTOMLEY: It's not a big difference between you and the expert witness.

1089. MR SMART: And the other thing on the petitioners' slide is that Japanese braking is actually higher. They use higher rates than the petitioners' slide. So there isn't a massive amount of difference but what we say is that at the lower speeds, in order to make sure that we can get capacity, that's when we use the higher braking element,

bringing in frictional braking. It's well below the safety standard of trains but we use that so that we can enter stations at a higher speed and therefore not have to reduce the capacity by trundling in, which you sometimes see at other stations.

1090. SIR PETER BOTTOMLEY: I think we've got this point.

1091. MR STRACHAN QC (DfT): I won't put it up on screen but the other document that I referred you to, just for the record, is Volume 3, technical appendices, climate section, where there's a graph which I referred the Committee to earlier of reducing from 360 to 300 in terms of carbon footprint. That's what you were referring to as the modelling work that's been done, Mr Smart, yes?

1092. MR SMART: That's right, yeah.

1093. MR STRACHAN QC (DfT): Thank you very much. Back to the slides, can we just look at A2068(20). Just one or two other points that were raised, Mr Smart. The other thing that was raised was whether other European or perhaps other national projects are seeking to do anything more than 300 kilometres per hour by way of future railways.

1094. MR SMART: Yes, they are. The Japanese are certainly looking to increase from their 320 and they have environmental issues as everybody does; but of course it's harder to achieve on existing lines rather than building new. The Italians are going at 360. And I should say, as the Committee is well aware, we are not at 360 ever on the line; we are not at 360 in our tunnels. And indeed the average speed to achieve the time to Birmingham is not going to be at 360. But there are times when the train goes 360.

1095. MR STRACHAN QC (DfT): I think the final suggestion was that you could reduce ticket prices if you travelled at 300 kilometres per hour rather than 360.

1096. MR SMART: Yeah. Actually I could go on a lot with this because of my involvement with ticket pricing for High Speed 1. But what I will say is that for the infrastructure element usually there's two components: there's the cover-all maintenance, renewal and operational charge for signal controllers. On a new railway it's relatively low because it's new infrastructure, it's new modern standard railway system equipment. And of course when you use things such as the European train

consult system, which is a radio based transmissions system, you haven't got lots of cables and wires and things everywhere. So in fact the maintenance charges can actually be quite low.

1097. It is a matter of course then for the pricing of commercial factors of what the next level of charging on top of that covering that maintenance would be. On High Speed 1, for example, that was set to pay a significant amount of the build costs; which of course why the Canadian Pension Fund paid £2.7 billion to run High Speed 1 for a 40 year concession.

1098. So what I would say is that you don't build railways to ship air. So you have to have a pricing structure that attracts passengers and that's clear.

1099. MR STRACHAN QC (DfT): Thank you.

1100. CHAIR: Okay.

1101. MR HENDRICK: Can I just ask as well: what percentage of running costs do you think a 7% reduction in the energy drawn from the overhead equipment… What sort of a difference would that make?

1102. MR SMART: I wouldn't be able to give you an answer off the top of my head. The point about the energy saving is you have to look at what the trains are actually doing. Because we will have braking regeneration, not just because it's good practice to have it but because it's a mandatory requirement under European standards on profitability. So I would suggest it would be in the order of around 7% to 10% of traction cost. Of course, the traction power cost is part of the parcel that comes through the ticket price, so that is a factor that would have to be covered in terms of the revenue.

1103. CHAIR: I think, as we have been sitting a long time, if you're happy we'll have a break now until about 7 o'clock.

1104. MR MCCRACKEN: I have some questions –

1105. CHAIR: Yes, I appreciate that. And then are you happy to come back after the break?

1106. MR MCCRACKEN: I'm entirely in your hands, sir.

1107. CHAIR: Well, the clerk has said you've been sitting there a long time so he's concerned for your welfare.

1108. MR MCCRACKEN: That's nice to know.

1109. CHAIR: Okay. Order, order. We'll reconvene at 7.00.

PUBLIC SESSION

MINUTES OF ORAL EVIDENCE

taken before

HIGH SPEED RAIL COMMITTEE

On the

HIGH SPEED RAIL (LONDON – WEST MIDLANDS) BILL

Monday 1 February 2016 (Evening)

In Committee Room 5

PRESENT:

Mr Robert Syms (Chair)
Sir Henry Bellingham
Sir Peter Bottomley
Geoffrey Clifton-Brown
Mr David Crausby
Mr Mark Hendrick

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IN ATTENDANCE

Mr James Strachan QC, Counsel, Department for Transport
Mr Robert McCracken QC, Nabarro
Mr Alastair Lewis
Mr Roger Bedson

WITNESSES

Mr David McGuffie
Mr Andrew Shaw
Mr David Wright
Mr Tim Smart, International Director for High Speed Rail, CH2M Hill
Mr Rupert Thornely-Taylor, Managing Director, Rupert Taylor Ltd, acoustics and vibration expert

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IN PUBLIC SESSION

INDEX

(at 19.00)

1. CHAIR: We're two minutes early, but as we're all here we may as well kick off. And as I say, you're going to be interrupted, so we'd like to ask a question of the witness.

2. MR MCCRACKEN QC: Thank you very much. Mr Smart, I'm sorry that I'm having to ask these questions to the back of your head, but you agreed I think that there is potential at least for one or two extra paths if the speed is reduced to 300 kilometres per hour?

3. MR SMART: Yes. There's potential for that. Yes.

4. MR MCCRACKEN QC: Thank you. The second point I want to ask you: Mr Strachan took you to the technical appendices, paragraph 5.1.9.

5. MR SMART: Yes.

6. MR MCCRACKEN QC: And there are four particular alternatives considered there, and none of them actually are alternatives involving a speed of 300 kilometres per hour throughout the route, rather than 360 max throughout the route.

7. MR SMART: Well, we did look at 300, and it says 'Alternative routes: 300' at 5.1.10.

8. MR MCCRACKEN QC: Yes. They were looking at alternative routes, not an alternative speed on this route.

9. MR SMART: Yes, but it also looked at the advantages that would come with that in terms of journey times, or disadvantages, and wider impacts. It's summarised in there but it did look at other effects that you could - and benefits with 300, and the balance was that 360 is the line speed. But as I've already said in evidence, it isn't 360 throughout. There are plenty of places where we are not going at 360.

10. MR MCCRACKEN QC: And in terms of noise effects it simply looked at how many properties would qualify for noise insulation, rather than actually looking at what the noise reduction would actually be.

11. MR SMART: That's the way it's assessed in there, but I believe - I can't give you a complete view on noise because I am not a noise expert, but it's expressed in that way. But I understand it to be - it did look at the wider implications of noise.

12. MR MCCRACKEN QC: And the first study, 5.1.19, that Mr Strachan took you, of reduction to 200 kilometres per hour, has nothing whatsoever to do with the reduction that we're advocating, does it?

13. MR SMART: Well, it's a point on the map you can interpolate, but I guess it's not what -

14. MR MCCRACKEN QC: No, it was - I mean, to suggest that the Committee should consider that seriously in this context was to seek to bamboozle the Committee, wasn't it?

15. MR SMART: No, I think the point -

16. SIR PETER BOTTOMLEY: It's quite clear that the maximum capacity on the railway, like on a road, is at 35 miles an hour. But no-one is proposing that either for motorways or for railways. So the question then is has the case from the petitioners to reduce the maximum speed to 300 kilometres an hour been made out? And the answer is it hasn't, whatever he says.

17. MR MCCRACKEN QC: I'm sorry, I'm not quite with you.

18. SIR PETER BOTTOMLEY: It'd be on the record.

19. MR HENDRICK: The starting point isn't 300 kilometres an hour. The starting point is 360, and you seem to address it as if things are the other way around.

20. MR MCCRACKEN QC: Well, it doesn't matter how you put it. We submit that our evidence demonstrates a substantial benefit if you have it at 300 kilometres per hour.

21. SIR PETER BOTTOMLEY: Your evidence shows that if the maximum of 300 rather than 360 you might save about 7% on the carbon emissions. You might save about - or lose some on the time. That evidence has been certainly disputed.

22. MR HENDRICK: But also in terms of the noise, when you mention the

mitigation - less mitigation that would be required, that doesn't get away from the fact that the mitigation around the 360 was designed to be more than adequate in any case. So just by saying you would need less mitigation because it's slower and it's a bit quieter doesn't mean that it's better than 360. It just means it's a different scenario.

23. MR MCCRACKEN QC: Well, with respect I disagree, and I submit that the approach you've just suggested is fundamentally flawed. It would undoubtedly be better from a noise point of view. Whether or not the advantages are sufficient to justify the Committee in deciding that the speed should be limited to 300 kilometres per hour is a matter for the judgment of the Committee. I, with respect, am surprised that Sir Peter suggests that the Committee has made its mind up.

24. SIR PETER BOTTOMLEY: I didn't say that at all. I said what we're considering is a proposal by the promoters. We're not testing the proposal by the petitioners. What the petitioners have given us in evidence is fairly clear because you kindly spelled it out for us. And so did your witnesses.

25. MR MCCRACKEN QC: Yes, and the point I'm putting to the witness is the relevant part of the technical appendices, dealing with the reduction of speed to 200 kilometres per hour, was quite irrelevant and an attempt to bamboozle the Committee.

26. SIR PETER BOTTOMLEY: Well, if it was there in the technical appendices it's there.

27. MR MCCRACKEN QC: Yeah, but it's not relevant to our case.

28. SIR PETER BOTTOMLEY: Well, in that case we'll get over it.

29. MR MCCRACKEN QC: Indeed, and that's my point.

30. SIR PETER BOTTOMLEY: Well, move on to the next point, then.

31. CHAIR: Let's in fact cross-examine the witness, Mr McCracken.

32. MR MCCRACKEN QC: Indeed. So far as the model is concerned - and you suggest that your figures - your figures in terms of energy saving and so on are based on a model - if there's an error in the input into the model, or indeed the way the method

has been operated, then you're going to get an inaccurate result, aren't you?

33. MR SMART: Well, any modelling, if there's an error you'll get an inaccurate result. So yes.

34. MR MCCRACKEN QC: Yes. It's summarised in the phrase 'Rubbish in, rubbish out.'

35. MR SMART: Correct.

36. MR MCCRACKEN QC: And we haven't been able to see the data that you've inputted into your model or the way you've carried it out, have we?

37. MR SMART: Well, it's quite a complex model.

38. MR MCCRACKEN QC: Well, indeed, but the point still holds good: that we haven't been able to see it to decide whether it really is justified or not.

39. MR SMART: No, you haven't.

40. MR MCCRACKEN QC: Thank you. So far as the figure of .67 metres per second - per second deceleration is concerned, that's a figure that comes, does it not, from HS2's consultants?

41. MR SMART: Yes. That was done in some early work, but that was early feasibility work done by Systra, and work has been taken on in fact by different consultants. But as I said in my evidence, that is braking that we use in perturbation and for the lower speed when we're entering into stations. At higher speeds you get across the critical throat sections at the highest possible lower speed, if I can put it that way. It is not the average braking we would use when we're out on normal running, and that is more in line with the evidence that was given by your Mr Connor.

42. MR MCCRACKEN QC: Yeah. Good. Well, if we're happy with his evidence -

43. MR HENDRICK: Well, Mr Smart went further than that. You said it's less than 5 that you were putting forward yourself.

44. MR MCCRACKEN QC: I'm sorry, I couldn't make out what you were saying, sir.

45. MR HENDRICK: I said Mr Smart went further than that and he pointed out that the figure they were actually using is 4.8, which is less than the 5 that your witness was putting forward.

46. MR MCCRACKEN QC: Thank you, sir. That's very interesting.

47. MR HENDRICK: And it's also quite factual.

48. MR MCCRACKEN QC: Thank you, sir. That's also very interesting. If we can then turn to the final point, and that is this: that if you can have more pathways then you can have greater capacity.

49. MR SMART: Well, it's complex. It's not quite as simple as that, because you also have to take account of the speed. And in fact to deliver the capacity it's - without going through all the maths, for the same number of rolling stock speed is a factor that helps deliver capacity. So it has to be a balance of speed, the headway and all the others things we've talked about.

50. MR MCCRACKEN QC: Indeed.

51. MR SMART: It's not quite as simple as saying 'Go slow and you get more train paths.'

52. MR MCCRACKEN QC: No, no. You've got potential.

53. MR SMART: You also lose out on the distance you're going, and that goes to capacity as well, so speed is a factor.

54. MR MCCRACKEN QC: You've got the potential to increase the capacity and you've also got potential - it may not be achieved because of the pricing - the complexity of the pricing structure - to reduce the fares as well.

55. MR SMART: I don't necessarily think that that's a significant factor, on reducing fares, in the speed, when you're looking at the difference we are talking about, bearing in mind we're not going at 360 over the entire length of the route, which in fact we mostly are in the order of 330.

56. MR MCCRACKEN QC: Mr Smart, thank you very much. There are many

matters on which we simply disagree.

57. MR SMART: Okay.

58. CHAIR: Do you want any -

59. MR STRACHAN QC (DfT): No. Well, I don't need to trouble Mr Smart with it, but for the record the alternatives appendices at volume 5, paragraph 5.1.5, explains that 300 kilometres per hour was looked at as an option in 2011 to see the effect on noise assessment, and it was further looked at, as I already explained in the volume 3 technical appendices which look at the effect on climate change.

60. MR MCCRACKEN QC: Sorry, 5.1.5 talks about looking at conventional and high speed.

61. MR STRACHAN QC (DfT): It concluded that the consultation route, if unmitigated and running at 360 kilometres per hour, would increase noise levels to such a level that fewer than 1,400 properties would qualify for noise insulation. At 300 kilometres per hour this number reduces to around 1,100 properties. However when mitigated - and including post-consultation written changes - the impacts of the high speed option would be reduced to the extent that only approximately 60 properties would experience such an increase in noise. The review also concluded it was likely that this figure would be further reduced during the EIO stage.

62. MR MCCRACKEN QC: I don't want to prolong the point, but this is the point I pout to Mr Smart, and that is that that doesn't actually look at the actual reduction in noise level. It simply talks about the number of properties to be entitled to noise insulation packages. But as I say I don't want to belabour the point. The pointed issue between us is, I think, as far advanced as it can be in the light of the nature of these proceedings.

63. MR HENDRICK: For reasons of fairness can I ask Mr Strachan what he feels about being accused of trying to bamboozle the Committee?

64. MR STRACHAN QC (DfT): Well, I've developed a thick skin in this process. I trust the Committee will just simply have the opportunity to look at the document I've identified and be able to come to their own conclusion as to whether I was bamboozling

or not.

65. CHAIR: Mr Thornely-Taylor.

66. MR STRACHAN QC (DfT): Yes, please. Mr Thornely-Taylor, on the issue of noise can I - I think there is really one point for you to deal with. That is the effect of moving from 360 kilometres per hour to 300 kilometres per hour. Can you just put up slide A2068(24)? And I think I suggested our position is - and you've given evidence on this previously - that it would result in a 4dB change. And this is based on information in the Environmental Statement appendices, and that's shown by the red line at this point over here. 300 is there and 360 is where the red line ends. And I think it's a 4dB change in Lmax levels from a reduction or an increase in speed of that kind.

67. MR THORNELY-TAYLOR: Yes. That's at 25 metres from the track with no noise barrier, just an open site.

68. MR STRACHAN QC (DfT): And I think the point was - I think the point that's made in response is the earlier slide, slide 23, I think it's being suggested that for LAeq levels there would be a greater change, and I think it's said it would be more like a 6 or 7 dB change in LAeq levels. Can you comment on whether or not that's correct, Mr Thornely-Taylor? 6 is what he said.

69. MR THORNELY-TAYLOR: Yes. This slide is well out of date. It's three years earlier than the Environmental Statement, and the annex that we talked about on a number of occasions, D2 in SP001000 takes - will lead us through the development work that was done to understand aerodynamic noise and the relative contributions of the four sources that make up the full train pass by noise. And the next slide, the 24 that we've just been looking at, is the up-to-date one and is the one we should look at.

70. The difference between maximum noise level at 360 and at 300 is greater than the difference between the LAeq, all other things being equal, for two reasons. One is that when you reduce the speed of a train you increase the duration of the noise, and LAeq is sensitive to duration. So that eats into some of the benefit in the reduction in loudness of the train as it goes by.

71. And the second point, which I've given in evidence previously, is that the

Environmental Statement assumes that 90% of trains are running at 330. 10% are running at 360. That doesn't affect the Lmax but it does affect the LAeq, and in fact the effect of combining 90% of trains at 330 and 10% at 360 gives you a starting point only about .2 of a dB above zero. The two curves on this chart -

72. MR STRACHAN QC (DfT): Just to be clear, I've asked to put on screen the document you refer to. This is in the technical appendices to the Environmental Statement, and I think the Committee has seen it before, but that's -

73. SIR PETER BOTTOMLEY: Zero is baseline?

74. MR THORNELY-TAYLOR: Yes. Well, zero is the 130 and this appears a few pages further into the document than Mr Gayler's slide 24. The red curve is Lmax, which from 360 down to 300 shows slightly less than a 4dB drop. The blue curve is a thing called SEL Sound Exposure Level - which is the basis of LAeq. You take the sound exposure level and then add a correction for the number of trains. But in all other respects it follows LAeq precisely.

75. If we were all running at 360 the drop in the blue line is about three, but in fact our starting point is only about 2dB above the 330 mark, because 90% of trains were assumed to be doing 330. So the drop in LAeq is less than 2dB.

76. MR STRACHAN QC (DfT): Thank you very much. I don't have any further questions. Wait there. There might be some -

77. MR MCCRACKEN QC: Mr Thornely-Taylor, I've got two questions, actually. First of all, you don't disagree though, with Mr Gayler, that if we took the figure that we extracted under freedom of information from the previous consultant the difference in LAeq would be six decibels?

78. MR THORNELY-TAYLOR: If you were to do something so out of date and unwise you would get a number bigger than the one that's in the figure that's in front of us.

79. CHAIR: Order, order. Division in the house. We're going to have to adjourn for 15 minutes. Sorry, Mr McCracken.

Sitting suspended

On resuming—

80. CHAIR: Order, order. We're now back with Mr Thornely-Taylor, Mr McCracken.

81. MR MCCRACKEN QC: Mr Thornely-Taylor, you had I think by implication but not by express statement agreed with my proposition that if you take the material supplied as a result of our freedom of information request in May 2010, then the difference between 300 and 360 kilometres per hour, LAeq was six decibels.

82. MR THORNELY-TAYLOR: I don't know. You'll have to extrapolate that figure, but that it doesn't go up as high as 360. But I agree that if you take 2010 data in preference to 2013 data you get an answer which does not agree with the 2013 Environmental Statement.

83. MR MCCRACKEN QC: Can the Committee work on the basis that the difference shown in the 2010 material is of the order of six decibels?

84. MR THORNELY-TAYLOR: I haven't put that much attention to it because it's out of date data. It would be necessary to extrapolate the chart and I haven't.

85. MR MCCRACKEN QC: Very well, Mr Thornely-Taylor. You are unable to help the Committee. It has the uncontradicted evidence of our witness. Thank you very much.

86. CHAIR: All right. Mr Strachan, do you have any further questions? Okay.

87. MR MCCRACKEN QC: I'm sorry, I have a further question for Mr Thornely-Taylor. Sorry.

88. CHAIR: Sorry. Sorry.

89. MR MCCRACKEN QC: Sorry.

90. SIR PETER BOTTOMLEY: What did that last sentence mean?

91. MR MCCRACKEN QC: If Mr Thornely-Taylor is unable to express a view on

whether this graph shows the six decibel difference that our witness says it shows then the uncontradicted evidence before the Committee is that of our evidence - our witness.

92. SIR PETER BOTTOMLEY: Unconfirmed evidence.

93. MR MCCRACKEN QC: No, it's uncontradicted.

94. SIR PETER BOTTOMLEY: It's unconfirmed as well. If he'd said he agreed that would be confirmed.

95. MR MCCRACKEN QC: It would be agreed. It - this witness has had an opportunity to look at the graph. He's had it since 2010. He's had our evidence since last week. He doesn't answer the question one way or the other. In those circumstances I think I'm entitled to make the submission that this is uncontradicted evidence. But it's for the Committee to take a view. The Committee is of course entitled to reject uncontradicted evidence.

96. CHAIR: Shall we get on with the questions, Mr McCracken?

97. MR THORNELY-TAYLOR: I have contradicted the evidence and he knows that.

98. CHAIR: Carry on.

99. MR MCCRACKEN QC: I won't respond to Mr Thornely-Taylor's rather provocative remark.

100. SIR PETER BOTTOMLEY: You just have by saying that.

101. MR MCCRACKEN QC: Mr Thornely-Taylor, if there's a four decibel reduction in noise level, which you assert would be the difference between 300 and 360 kilometres per hour, what is the reduction in energy level?

102. MR THORNELY-TAYLOR: A 3dB reduction is a 50% reduction in energy in terms of watts per square metre.

103. MR MCCRACKEN QC: Well, that wasn't the question. I said if you've got a four decibel reduction what's the reduction in energy level?

104. MR THORNELY-TAYLOR: It's about a 60% reduction.

105. MR MCCRACKEN QC: I'm instructed it's about a 70% reduction.

106. MR THORNELY-TAYLOR: It's between the two.

107. MR MCCRACKEN QC: Well, let's say we'll compromise on 65%. And the reduction in loudness is about a quarter, isn't it?

108. MR THORNELY-TAYLOR: No. You'd have to have about a 10dB reduction to halve the loudness.

109. MR MCCRACKEN QC: Yes, but this is not a 10 decibel reduction. This is a four decibel reduction, and the proposition I'm putting to you is that the reduction in loudness would be about a quarter.

110. MR THORNELY-TAYLOR: I think it's difficult to understand the question. Probably the question is would the loudness be about 80%? And the answer would be 'Yes'.

111. MR MCCRACKEN QC: Well, the question was, if you want to put it in those terms, 'Would the loudness by 75%.' That was the question. It would be - and your answer is it wouldn't be a reduction of a quarter; it would be a reduction of a fifth?

112. MR THORNELY-TAYLOR: There's a danger of these terms being misunderstood. If it was a reduction of 10 the loudness would be about 50%. If there were a reduction of 5 you could say the loudness would be about 75%. A reduction of 4, a bit higher than that, about 80%.

113. MR MCCRACKEN QC: Yes. So it's not that it would be reduced by 80%; it would be reduced by 20% to 80%?

114. MR THORNELY-TAYLOR: I'm not going to say anything other than the evidence I've just given, because there's too much danger of these rather unconventional ways of expressing loudness being misunderstood.

115. MR MCCRACKEN QC: I'm sorry, I completely fail to understand why if you reduce the noise from 100% to 80% you haven't reduced it by 20%, i.e. a fifth.

116. MR THORNELY-TAYLOR: All I'm prepared to say is that a reduction of 10

takes you to about 50% of the loudness. A reduction of 5 takes you to about 75% of the loudness, so a reduction of 4, let's say 80% of the loudness. And if it's expressed in any other terms it will be misunderstood.

117. MR MCCRACKEN QC: Well, it doesn't matter how you express it. There is a broad agreement, therefore. In the case of my witness he thinks that it's a reduction of a quarter to 75%. You say it's a reduction of a fifth to 80%.

118. MR THORNELY-TAYLOR: He is overstating the reduction.

119. MR MCCRACKEN QC: Yeah, but the point is, whether it's a quarter of a fifth, it's of that order.

120. MR THORNELY-TAYLOR: I'm sure, sir, you don't want me to repeat that evidence.

121. MR MCCRACKEN QC: I have no other questions, Mr Thornely-Taylor. Thank you very much.

122. CHAIR: Thank you, Mr Thornely-Taylor. Any more witness, Mr Strachan?

123. MR STRACHAN QC (DfT): No. I was going to deal with the points just by way of submission. And can I just cover them as they cropped up? And I'm very conscious the Committee has heard a lot of evidence about this, these topics, and so I'll refer back to everything you've heard previously but I'll just try and deal with some of the additional points that might have cropped up.

124. So far as train speeds are concerned, you've heard from Mr Smart as to the position on train speeds. There are, and there has been, an assessment of a reduction of train speed from 360 kilometres per hour to 300 kilometres per hour. Those assessments are contained variously in the alternatives report, volume 5 that I refer the Committee to, the volume 3 Environmental Statement, and they're summarised in information paper A1, paragraph 5 onwards.

125. And you can see by way of summary at 5.4 in that information paper the effects of taking the speed down to 300 kilometres per hour examined. The effects examined included reducing carbon, reducing noise impacts and providing greater flexibility to

avoid sensitive areas as a result of tighter curves, and it was concluded that the conventional speed line would not offer a reasonable alternative, as the economic and transport benefits of high speed would be far greater, and any environmental advantage would be relatively marginal, and a higher design speed which I don't need to trouble you with.

126. And then in addition at paragraph 5.5 local speed reductions were considered, and you can see at 5.5 that in addition to looking at the issue globally those local speed reductions were identified as, on balance, not being justified. You can find more detail in volume 3. I'm not going to read it all out. But the short point of all that is that the promoter's position is that the 360 kilometres per hour speed, that's been identified as the correct one, and alternatives have been considered and you'll see that they consider all the potential effects of that, whether it be from noise or carbon,

127. And that brings me on to the issue of - I'll deal with noise first. As Mr Thornely-Taylor has identified the effects of reducing from 360 to 300 kilometres per hour result in a 4dB - slightly lower than 4dB change in LAmax levels., a lower level of change in relation to LAeq levels, and those are all based on assessments without taking into account mitigation.

128. And of course a key principle of this railway has been to put forward in the bill a railway designed for 360 - sorry, with trains operating up to 360 kilometres per hour, where the noise effects have been mitigated on that basis, and that's the way in which the Environmental Statement has proceeded. So for all of those reasons we obviously reject the idea that it would be sensible or appropriate to impose any limit of the type that's now being suggested.

129. On the issue of capacity Mr Smart dealt with the corresponding effects of reducing down to 300 kilometres per hour. There is no practical addition to capacity, for all the reasons he's identified, when you analyse it.

130. On the question of carbon there is a wealth of information available to the Committee on the issue - the effects of the carbon footprint of the project, both at 360 kilometres per hour, and indeed an assessment at 300 kilometres per hour. I've given you the relevant part of volume 3 where the 7% change in the carbon footprint was identified. There's a lot more information in there because, for example, it

identifies that that's based upon a 60-year assessment for the railway, that the 7% reduction would be achieved.

131. Over a longer period the carbon effects - the carbon footprint of the project even out because the operational benefits of a railway and providing that infrastructure are identified. And in that same section the comparative benefits of rail travel and high speed rail travel over other forms of transport are identified, and they - sorry the carbon issues also identified in the sustainability statement at appendix F - part of the carbon assessment includes sequestration through use of trees, and you heard about the two million numbers of no less than two million trees to be planted as part of the project.

132. There is, as you know - and again, I don't repeat it - but there is in the information paper E23 - if I've got that right - E26. I didn't get it right - E26 is set out the way in which, as part of our mitigation strategy the mitigation generally, including planting of trees, are subject to monitoring and the time periods for the monitoring and insuring trees remain in place are variously set out in information paper E26.

133. And as you have heard, the concern about, for example, land owners taking land back which has mitigation on it have been addressed through - and will be addressed through appropriate covenants placed upon that land if it is returned, to ensure that mitigation planting, not just for trees but other things, is sustained in the future. That of course has generated its own conflict with those who see that - or who perceive that there may be too much mitigation, and we've been dealing with that on a site by site basis as the project has gone through the house.

134. MR CLIFTON-BROWN: Mr Strachan, we were hearing that on HS1 there was a 30 - or up to 30% failure rate of trees.

135. MR STRACHAN QC (DfT): Yes.

136. MR CLIFTON-BROWN: I am just wondering, by making the original land owners responsible for the management of those trees, whether you wouldn't get a better outcome than your own contractors doing it.

137. MR STRACHAN QC (DfT): Well, I don't have a - I can't confirm or contradict the 30% take up, but I note the witness said there was consequential replanting, and of

course that's part of the commitment. If, for example, the trees fail as part of the monitoring process they are replaced. But on the question of the standards that will be applied, there's quite a lot of detail in E26 as to the processes that would be put in place for monitoring. And as I - I think I identified in the Code of Construction Practice there's also quite a lot of detail about trees and the control on trees as part of the construction process, the selection of appropriate trees, which is covered in the detail in the Code of Construction Practice.

138. Whether or not one gets a better outcome if the land is returned I would be speculating. I don't know whether that's the case. But I think the concern that's was being raised by the petitioner was that these trees wouldn't be guaranteed, and the point I was making is that there are covenants in place to - there will have to be covenants in place to cover return of land to ensure that the trees are kept in place.

139. MR CLIFTON-BROWN: 30% loss on two million trees is a significant expense for somebody, and surely it would pay HS2 to go to every possible precaution to try and reduce that. In my experience of planting trees it's not necessary to have a 30% loss, or indeed anything like it.

140. MR STRACHAN QC (DfT): Yeah, I - there's certainly, as I understand it, a natural percentage loss in tree replacement. I don't know what the current -

141. MR CLIFTON-BROWN: But not that high.

142. MR STRACHAN QC (DfT): I don't know what the current accepted figure is. It's not in our interests, of course, to have any higher than is strictly necessary, so there's a mutual interest there. I understand - sorry, this is from E26. Paragraph 3.1 identifies that the successful establish of habitats will be a crucial element of the project, and we, at 3.2, expect - it's on the screen now. We expect the process of agreeing an appropriate management maintenance strategy will consist of reaching agreement with Natural England on management, maintenance and monitoring approaches. And of course the prescriptions, durations and frequencies and the mechanism for providing all of that. so I take the point, but I believe that it's covered by this approach set out in this document.

143. Whether - and I understand the point you're making about whether return of

habitat to farmers, for example, may benefit a better outcome. That's already part of the scheme. If we can agree appropriate covenants about continuation the general approach is to return land where a farmer would like the land returned to them. So in a sense what you're identifying, if it is a beneficial outcome, will be reflected in the way the project goes forward.

144. Sir, I'm just coming - trying to cover everything as quickly as I can. On ecology, you heard a lot about ecology when Warwickshire came in and our approach to route-wide ecology issues. And as a matter of principle you should be wary of the comparison that's been made with other railway lines, particularly in Europe as we discussed, in comparing, for example, the 16 green overbridge structures.

145. Because of course that doesn't take account of the fact that a very substantial part of this project is in bored tunnel, a large percentage of which is in the countryside. I think it's over 23% of the whole route is now in tunnel, and over 16 kilometres of which were in, for example, the Chilterns areas. And therefore it's simply not a valid comparison to look at our scheme as compared with some other European projects. I think you looked at one in - the line going on to Strasburg, where no such% use of tunnels are proposed. And our project has a very considerable amount of tunnelling. It has a considerable amount of green overbridges.

146. But more importantly, those have been identified in locations which are appropriate to provide connectivity with species, and our approach has been to identify where connectivity is required and to put it in place. And you've heard a lot of debate about that during the course of the petitions.

147. SIR PETER BOTTOMLEY: I'm not arguing with you, but just to rehearse what we heard, is that where you do have the railway line in the open - and it doesn't have the benefit of a viaduct, say, that the gap between the natural crossings for wildlife is rather greater than would be desirable.

148. MR STRACHAN QC (DfT): Well, that is a point that was made. I don't think there's any standard. And our approach and our response has been to identify where connectivity is actually required. I haven't covered, for example, other elements of connectivity which are achieved through culverts and matters of that kind, which now allows wildlife to pass through.

149. But where we have identified the need for connectivity which isn't achieved through that sort of methodology we've identified where green bridges are required, for example, to deal with bats in particular, particular locations where they should be placed, and we've also had a - I think a healthy debate about the size of these green overbridges by reference to relevant standards or emerging standards. And you've heard evidence that we've given about the size of the green overbridges.

150. So my general point is I don't know whether there's a standard approach to how often one has a green overbridge. The more important point, we would say, and the correct approach, is to identify the location for green overbridges based on where they're actually required. And I think you'll find some more information about that in information paper E15, where we summarised our approach in the key locations.

151. So that brings me on to the question of no net loss. And again, you've heard evidence about no net loss. There is no policy requirement to achieve no net loss in any particular project. There is an identified aspiration to achieve no net loss which this project is reflecting, and as part of that we're providing calculations of the overall no net loss. We've already published one this year, which I think shows a three% - currently a three% deficit. That will be a continuing process, to see whether that can be improved.

152. We've built in fairly robust assumptions against ourselves as part of that process, for example loss of hedgerows. Many of these things can be further mitigated. I should emphasise our no net loss approach is not based upon looking at loss of habitat in particular locations to identify how much one should provide in a particular location. We have sought to mitigate loss of habitat in particular locations, and to provide for replacement habitat which is appropriate close to those locations, in part to achieve connectivity.

153. There are many examples along the line. The Bernwood Forest area perhaps is one that a lot of time is spent upon in relation to bats. You will see that part of that approach was to provide connectivity between areas of existing woodland, and consequently in some cases to increase habitat by reconnecting previously severed habitats.

154. That in itself has sometimes produced its own controversy, and the Committee has heard again healthy debate about that. But what you will see through the process we've

identified is a very focused approach on identifying where habitat is affected and then replacing it appropriately in the general area. Not everyone agrees with whether we've taken the right amount, but that's the sort of debate we've had throughout this process.

155. Can I just touch on surveys again? I'm not going to spend a lot of time on that, but you will see that the Environmental Statement is underpinned by surveys. In some cases we haven't been able to have access to the land. That's the nature of where we are in the bill process. In those cases where land access hasn't been possible robust assumptions have been made as to the potential effects and the potential for a replacement habitat or effect on species, all of which of course is heavily scrutinised by Natural England, amongst others.

156. So for the purposes of the Environmental Statement you have a worst case scenario where it's possible, as a result of more detailed survey works, either to pull in a replacement habitat or to look at habitat again. That process will occur through the detailed design process that you've heard about.

157. On waste, if I could turn to waste. Can I refer the Committee to information paper E3? We'll see that in information paper E3 the waste hierarchy approach is actually already reflected in our own policy documents. Curiously, if you go down in that document you'll see, a little bit further down - you'll see, for example -

158. SIR PETER BOTTOMLEY: Your pyramid's upside down.

159. MR STRACHAN QC (DfT): Our pyramid - we say it's the right way up, but -

160. SIR PETER BOTTOMLEY: It's unstable, then.

161. MR STRACHAN QC (DfT): It's the same pyramid, but we've started - if you're reading the page downwards you start with prevention and move down towards a disposal at landfill at the very bottom of the pyramid structure. So none of this - none of the points that were raised by the Action Alliance in the petition is news to us in terms of approach. We're reflecting that approach in our approach to the scheme. And of course detailed work is ongoing in dealing with waste streams based on the waste hierarchy, where we seek to prevent waste arising, and disposal in landfill is the very last option.

162. And as part of that process of waste we are looking already at minimising the amount which is treated as waste and liaising with the industry, as I think was being suggested should occur. That's already taking place, for example the Construction Products Association, to look at reusing materials that may be useful to others before they're disposed of at landfill.

163. So once you look at information paper E3 you'll see that in fact despite the way in which the asks are put by the petitioner there's very little difference between what they would like to see and what we're already doing as part of the project. And we have made yet again, for the purposes of the Environmental Statement, very cautious assessments where we've had to assume that anything we don't use and haven't got a use for in terms of embankments or other materials, has to go off site for off-site disposal, and consequently calculated, as you have heard - for example, HGV movements based upon those rather pessimistic assumptions.

164. However, if the consequence is that there is improvements in that process we use more of the waste - what was waste as part of the construction process as we progress with a detailed design. The consequential benefits will be felt in a number of ways, and the waste hierarchy reflected in that approach. So -

165. SIR PETER BOTTOMLEY: So in effect you're pretty close to the worst case, and if you better number of lorry units reduces in so far as there will be lorry movements involved?

166. MR STRACHAN QC (DfT): Exactly. And you've heard that - I can give you an example. A reference is made to AP4 saying that we've now assumed there's going to be more excavated material. Yes, that's right. Of course that's right, because we've been asked - I say we've been asked - we have proposed as a result of the Select Committee's observations to extend the bore tunnel. That produces more material at the entrance to the Tunnel in the Colne Valley. We have to assume, for present purposes, that that material has to be dealt with, and not by, for example, further sustainable placement.

167. However, as part of that process, whilst we assume off-site disposal of additional material as necessary, if there's the scope to use more material there will be a consequential reduction in material that goes off-site. So - or goes as far as waste

landfill. It may have to be moved up the line or something. But generally that's the approach we've adopted.

168. I'm trying to battle through them. Can I just, I think, turn to the last item but which came first on the list of the petitioner, and that's to do with an independent adjudicator to deal with the project. And I'm very conscious, and we - Mr Mould in particular, I think, last week and in previous occasions has addressed you on this on a number of occasions.

169. But can I just summarise the position? Information paper E1 sets out, in summary form, all of the various mechanisms that exist to enforce the environmental obligations as a whole of the steam producers. And there are both provisions in the bill which are retained as part of approvals mechanisms, and of course in addition to those there are the undertakings and assurances and processes of enforcement that you've heard about; if necessary escalating through parliament, but nobody anticipates that ultimately that will be necessary. But that sanction is there.

170. What I mean by provisions in the bill, you know about the various approval processes that already exist, for example, under schedule 16, with the involvement of local planning authorities, if they choose to be local qualifying authorities, to approve the details of the later stage of earthworks, for example, as part of the overall approval process of what was showing in the Environmental Statement and the bill.

171. You have the section 61 processes for controlling work sites and working hours, which you've heard a lot about. That's in effect embodying the Control of Pollution Act requirements that already exist for construction activity. We have the protected provisions under schedule 31. Again, you've heard a lot about that, but for example in respect of water and drainage issues.

172. You have approval of transport management plans by highway authorities, approvals in respect of road accesses, which will have to be identified and approved. And so those are already embodied into the bill, which introduce the involvement of local authorities or highway authorities or other public bodies in regulating the overall effects, both in construction and operation.

173. On top of that, you have the undertakings and assurances that have now been

given as part of this process, enforceable in the way that's already been identified. Principally, by contractual obligation - these will all be contractual obligations imposed on the relevant contractors as part of the nominated undertakers entering into contracts for the construction of the process.

174. In addition to all of that we have the construction commissioner who is - is an independent commissioner. He or she will have a role of oversight, independent oversight of what's set out in information paper G3, and that is to deal with the effect of this project during construction and to provide an independent body to deal with complaints.

175. As set out in that information paper, it's very much expected that complaints, if they arise in a day to day basis, are dealt with at source, and that's obviously the most desirable objective, if the complaint can be dealt with efficiently and effectively by the nominated undertaker.

176. But failing that, there is already the independent oversight of the Construction Commissioner to address complaints which aren't satisfactorily addressed. And as you can see from paragraphs 3.2 to 3.3 the Complaints Commissioner will be independent, and indeed the precise terms of reference for the complaints - Construction Commissioner - did I say Complaints Commissioner? I apologise - Construction Commissioner will be established by an independent body, and you can see the functions of the Complaints Commissioner set out in the bullet points. So that is yet a further layer of control over the construction of the project.

177. There are also - and I can't go through them all, but there are also various undertakings and assurances which exist in respect of monitoring, albeit air quality or noise, which have already been variously looked at. In those circumstances, with all of those raft of measures which exist we maintain, as we have previously identified, that adding yet another independent adjudicator of the type that's now being suggested is unnecessary and clearly inappropriate in the circumstances where we have a full system of control.

178. The environmental minimum requirements include of course the Environmental Statement obligations which were set out, and where the project results in significant effects which have not been assessed they will be outside the scope of the - what is set

out in the Environmental Statement and what is proposed, and would need further permission to occur.

179. So I'm trying to give you an overview of the controls. It's summarised no doubt far more elegantly than I've just done it in the information paper E1, and some of the other submissions you've heard on a number of occasions.

180. Can I just emphasise, then, in final remarks, that the - we've been handed the document today which suggested changes to the bill, with many provisions in it that the Committee is being invited to recommend be put into the bill, including those relating to an independent adjudicator.

181. I wasn't going to go through them all even if I'd had the opportunity to do so, because we've just been given it. But needless to say if, contrary to the submissions I've just made as to the absence of a need for any of these things, we certainly would wish to comment on the detail of any clauses that are now being put forward, such as the role of the HS2 adjudicator and the wording that's been put to you. But I think the principal point of my response now is to explain why we don't regard any of these suggestions as necessary or appropriate in the way I've just done.

182. MR CLIFTON-BROWN: Mr Strachan, you've been very helpful in terms of how to see a remedy whilst the line is being constructed. Could you just add to your explanation what the remedy for complaints will be once the line is constructed, the actual operation of the line?

183. MR STRACHAN QC (DfT): Yeah. The operations of the line are principally covered by the Environmental Statement and the environmental minimum requirements I've just identified, and the undertakings and assurance - additional undertakings and assurances which have been provided as part of this process. So the reason why there's a focus on the Construction Commissioner is because the principal concern has historically been in relation to the environmental effects of construction activity, be it - and indeed contractors not operating as they should do under the various contracts. And that reflects past practice, I think, where I think Crossrail and other projects have had Construction Commissioners.

184. The operation of the railway - there isn't the need for, we say, a further

Complaints Commissioner in relation to the operation of the railway. Such things such as the overall effect of the railway once constructed will be government by the parameters of what's been allowed in the bill by the authorities with approval for the detailed design, and controlled if necessary by that process of authorities looking at whether we've built what we said we were going to build, and ultimately the sanction of the Secretary of State who is responsible for the scheme as a whole, and compliance with the bill and the Environmental Statement.

185. SIR PETER BOTTOMLEY: If somebody noticed that a covenant wasn't being honoured, say on maintaining the trees that have been planted for example, who would be the enforcing authority? Suppose my neighbour had agreed to have 10 hectares of wood put in and then took them out again, and I said who would then do anything about it? I mean, firstly somebody needs to notice; secondly somebody needs to report it; and thirdly somebody needs to do something about it.

186. MR STRACHAN QC (DfT): Yes.

187. SIR PETER BOTTOMLEY: What would happen?

188. MR STRACHAN QC (DfT): Well, the ultimate controller is the Secretary of State, who is responsible for the bill and the project. If there has been a breach of covenant, for example, or a breach of contractual undertakings, effectively what the breach of covenant would be, the Secretary of State would have the ability to enforce that covenant with the particular land owner as necessary, if someone were in breach of what they had been contractually obliged to do.

189. SIR PETER BOTTOMLEY: So in your view, the Secretary of State rather than the people running the railway?

190. MR STRACHAN QC (DfT): Well, the Secretary of State, I think it's expressed, 'or the nominated undertaker'. So there's no reason why obligations given to the nominated undertaker wouldn't be enforced, for example by HS2 Limited if it's still the nominated undertaker. The obligations - contractual obligations would be enforceable. But I mention the Secretary of State as being the ultimate controller.

191. But that is the way in which any breach of these contractual obligations can be

directly enforced by whoever it would be: the Secretary of State or the nominated undertaker. And in that respect there's no difference to this project to other major infrastructure projects, and there is no - and I think my learned friend accepts - no precedent for what is being sought, let alone a need for it.

192. SIR PETER BOTTOMLEY: The precedent is the weakest argument. I mean, the historic negatives doesn't really wash. The other arguments might weight more.

193. MR STRACHAN QC (DfT): I've already explained why I don't set my store on precedent, but it's a useful indication because if there were clearly well-documented deficiencies in what's gone in the past in terms of enforcing these sorts of things then one might start to see the need for some other oversight body. But that's not the case and indeed that's why I put it more on a basis that there is no need for it, bearing in mind the controls that do exist.

194. CHAIR: Thank you, Mr Strachan. Any brief final comments, Mr McCracken?

195. MR MCCRACKEN QC: I commend the written summary reports. I commend the oral evidence of our witnesses. I make the following five further points very briefly: as to speed, whether the reduction in energy use during operation is 20% or 70%, it's not something that should be missed. It's worthwhile, both in terms of carbon reductions and in terms of money saving, and it's important and it should be taken.

196. Even if the reduction in sound is to be taken as the one suggested by Mr Thornely-Taylor of four decibels, and even if we're to treat that as a reduction only to 80%, that's a reduction of one fifth. If our witness is right it's a reduction of a quarter to 75%. And it doesn't really matter how we express it. It is a substantial difference.

197. The Environmental Statement itself accepts that a reduction of three decibels is significant, and we're talking here about every loud noises, and we're talking about noises about 80 going to 90 decibels. So -

198. SIR PETER BOTTOMLEY: And 25 metres unmitigated.

199. MR MCCRACKEN QC: Yes. And actually if we reduce the speed the reduction that we're able to achieve by the barriers will be even greater, because a high proportion of the noise comes from a height at which the barriers won't be able to impact. So that's

- I make that point briefly.

200. As to the independent adjudicator, well, there are a number of points there. Most of the points I made in penning and they're there. And I think really in a sense I think Sir Christopher Wren said, when asked for his monument, 'Si monumentum requiris, circumspice' – 'If you want a monument, look around you', at St Pauls. Well, I say think about all the presentations that have been made over the last 18 months. Think of all the complexity of the measures that are being put forward to project people. This is a case that cries out for an independent regulator.

201. So far as contracts are concerned, very astute questions by members of the Committee. In the case of a contract, or a covenant, a critical thing is who has the benefit of it? And that's - and the great merit of the scheme that we've suggested is the constructor and operator is protected by the fact that the adjudicator has to intervene before the enforcement notice is served, but once the enforcement notice has been served, then the individual, the little person, is able to get redress in the courts and compliance is achieved by prosecution without the need for the speaker to be summoning people and sending them to the tower of the House of Commons.

202. Our questions about operation are highly material to this, because of course so far - the operation is going to go on for 60 years. The planting has got to consider - got to last for a very long period of time. And as Mr Clifton-Brown's question - penetrating questions demonstrated, the attrition rate with HS1 was worryingly high so far as trees are concerned.

203. And one of the beauties of the draft that we've suggested inclusion in the bill is that it requires annual reporting to parliament, and parliament has, collectively, a tremendous experience of estate management, land owning, tree planting and love of the English countryside, and therefore it's in a good position to benefit from that provision that we suggest.

204. Ultimately we - my learned friend referred to a raft of measures to protect people. Well, I'm very conscious that Sir Thomas Hammer was suspicious of treaties with France. He stands above us. But I can't help thinking about, when we talk about rafts, of a painting which was to be found in Paris, The Raft of the Wreck of the Medusa, and I would suggest that so far as people - the genuine sense of security and real

reassurance, the raft of measures that is proposed here is more like The Raft of the Wreck of the Medusa than the Kon-Tiki expedition that enabled people to cross vast oceans.

205. And I think - the final point is quite simply this. Sir Peter has quite, I think very fairly, indicated that his question about precedent was not intended to indicate an obsessive concern with precedent, and I've already indicated that that, as it were, corresponds to our view. But can I, in the same vein in which the point was raised, indicate that the very first independent regulator that parliament ever required was in relation to railways. The early railways were ones that caused great concern in terms of safety and amenity.

206. In particular of course it was sparks and so on causing fires alongside the track. But Her Majesty's Inspectorate of Railways stems from a Committee and a group of MPs such as yourselves doing something that hadn't been done before, and if there's one thing of which we can be proud in this country, among many others, it's that we're prepared to innovate even though we have a respect for tradition. And I would suggest the right way to combine those two here is to protect our traditions and our countryside and the quality of lives in people's homes by innovating and having the independent adjudicator.

207. CHAIR: Thank you very much for your contribution. We now have to move on. Thank you. We're going to go with 228, AP2:8, Roxane UK Ltd with a statement before we come onto you, Mr Bedson. Alastair. You're also going to deal with Lichfield Cruising Club. Mr Lewis?

Roxane UK Limited

208. MR LEWIS: Good evening, sir. I'm going to hand over to Mr Strachan on Roxane, because he has brought the statement that we agreed that we agreed would be read out and I didn't.

209. MR STRACHAN QC (DfT): It's not going to take long. The Promoter and Roxane UK Ltd have been discussing the concerns raised in the petition and have agreed to continue to do so on the basis that, if there are matters outstanding, they can be raised in the House of Lords.