evidence on Monday; and in particular dealing with the handwritten document that was put in on his behalf after he'd given his evidence. It's at P7504(1), it runs to some five pages. I can have paper copies made available to the Clerk at a convenient moment, perhaps later on today, but just draw that to the Committee's attention.

133. CHAIR: Thank you. Good morning, Mr Miller.

134. MR MOULD QC (DfT): Mr Miller, can we please put up R1305(3), just like you to start please with the policy?

135. MR MILLER: Yes.

136. MR MOULD QC (DfT): And help us with the approach the promoter has taken to the development of the design of the railway through the area of outstanding natural beauty in the light of area of outstanding natural beauty, in the light of the policy and also of course, having regard to the statutory duty that Ms Daly drew the Committee's attention to a few moments ago?

137. MR MILLER: Yes, I think possibly the best way of doing that is to have a think about the sort of historical context of the development of the railway since we got the remit back in 2009. I won't go into any great detail about that, but broadly what we have been looking at is to develop a new high-speed railway network on the first phase between London and the West Midlands, and with London and the South-East; and the West Midlands, Birmingham, in the northwest. When you look at the position of London compared to Birmingham, and where the area of outstanding natural beauty, you'll see that the area of outstanding natural beauty is just on the north-western edge of London.

138. MR MOULD QC (DfT): If you want to put up P7373 just to get our bearings?

139. MR MILLER: So in developing a railway through or across the area of outstanding natural beauty what we needed to do was to look at natural ways of crossing the area of outstanding natural beauty and of course they are a set of hills to the northwest edge we have the scarp slope and there are sort of lower slopes as you go down on the south-easterly direction. What's folded in that landscape are a number of valleys which cross that southeast, northwest direction; quite a lot of those are already

taken up by motorways, railways, roads of one sort or another. We have found that the A413, the River Misbourne valley to be the best alignment for the high-speed railway.

140. SIR PETER BOTTOMLEY: Can I just break in to ask questions we may have known the answer to, we may have asked before? If there'd never been a thought of a Heathrow Spur, would you have taken the West Coast Mainline route and then gone off?

141. MR MILLER: I don't believe we would've gone along the West Coast Mainline route. When you look at that route, in the vicinity of Berkhamsted and through the Chilterns there – actually Berkhamsted on the edge is quite highly populated, right on the edge of the AONB. It's a crowded corridor; I've previously worked on the West Coast route modernisation and there are – it's a four-track railway; it's quite confined through that section, so it presents other issues.

142. SIR PETER BOTTOMLEY: It's not just the Heathrow proximity which…?

143. MR MILLER: No, that's right, and of course, it's taking you off on quite a northerly trajectory; what this does is not quite in the Chilterns, but further up, we take up the route corridor at a point, of the Great Central Railway. So, this is truly the southeast, northwest route. If you were to put a ruler in the centre of London and to the centre of Birmingham, this is the –

144. SIR PETER BOTTOMLEY: It would be more this way than the others –

145. MR MILLER: Yes, it's the closest approximation of a straight-line route?

146. MR CLIFTON-BROWN: May I ask, presumably when you were designing it, you could've shifted it a few – a hundred yards one way or the other; you've actually taken the widest bit of the AONB, point 1, why did you do that? I accept that it may be a straight line, but was that the right thing to do. Point 2, why did you choose to tunnel the southeast bit of it, which is the flatter bit of it, and not the northwest bit of it, which is the hillier bit of it?

147. MR MILLER: Yes, I may have given you a slightly wrong impression about the broad geography of the –

148. MR CLIFTON-BROWN: Well, if you look at this map, it completely illustrates what I've just said.

149. MR MILLER: When you look at the M25 and where we put the portal in to go under the Chilterns, we're still in – the chalk land is quite high. So, the tunnel alignment as it goes from that point up to Mantle's Wood, we are in quite high ground. And, what you're trying also to do is get yourself under the River Misbourne, which you heard about earlier this week, before coming up and meeting the valued sights of the River Misbourne and the dry valleys which have also been described. So that's our consideration of the route alignment here. There's a lot of people living in that area as well, and the area of Denham and the Chalfont, particularly, have seen a little bit in the Committee before, in the Colne Valley discussions. So there's quite a lot of places where people live. So there are a number of things in play which gets us to a place where a tunnelled route is the most appropriate in the southern section of the route going through the Chilterns.

150. What that does mean is that you end up with a route alignment in a tunnel for a reasonable proportion in the area of outstanding natural beauty itself, before it pops out at Mantle's Wood, and we'll show you a slide of that shortly. And before we take on a more surface route, albeit using a cutting and a number of green tunnels. When you get further north, from Mantle's Wood, what is happening there is that the existing transport corridors follow the valley floor. The Chiltern Line in fact comes off a series of very deep cuttings, from the Amersham area – and for those of us who travel through that, we understand that those are quite wooded as well. So that's sort of in the dry valley sides of the Chilterns, at that point of the Chilterns. Then, that railway comes down into the area of Great Missenden and serves Great Missenden, but it is following the valley floor.

151. The A413 which I think is a very close approximation of the London to Amersham Turnpike, so it's a traditional route through this valley, again, it broadly follows the line of that route, and it's taking that surface – that low route along the valley floor. That's able to do that because it can follow the topography much better than the High Speed Railway can, where we have to be fairly flat and the horizontal curvature of the track needs to be fairly shallow.

152. So, we can't do what the road or the old railway does further north. So our railway ends up being fairly straight but takes in a route alignment which is tucked into the valley sides, variously along the dry valleys which run perpendicular to the main valley which runs southeast-northwest, and then finally cuts through this escarpment at Wendover. So you've got Coombe Hill, Wendover, and Wendover Woods on the other side. So that's that more typical escarpment kind of landscape that you've perhaps seen in textbooks.

153. MR MOULD QC (DfT): We saw the ancient high road I think on Ms Kirkham's historic maps the other day, we could see the line of the route going through the valley?

154. MR MILLER: That's quite interesting because there's a route through, on the valley floor; and there's a route on the plateau edge, further on. Now, we can't meet either of those, and so we're tucked into the valley sides, and that means that going further north as you get beyond Mantle's Wood and the historic buildings that you've seen at Hyde Farm, that sort of area, then going onto South Heath. You've got a section of green tunnel at South Heath, covered over, but then going beyond that; you've got a cutting that is sort of set into the valley sides. Then you get to a point where I suppose the deepest dry chalk valley, which is the Wendover Dean, is where the most exposed viaduct will be on the railway, because it takes up that view, and there's a view from Kings Ash, and there's a distant view from the other side as well. So, we can't do very much about that, with that alignment, because it's coming off of the hill coming down to Wendover, where you saw on the slide there, where the roundabout is, and all of those transport corridors really are truly converged. So hopefully that…

155. MR MOULD QC (DfT): If we just put up – I don't want to take too much time on this but if we just put P7387? We've got some long sections which perhaps help just to illustrate on plan, on the points you were making about topography. So this is the railway coming from West Hyde through the southern portal, and then passing in tunnel through the Chalfont, and you can see with that green outline, you can see the topography at this part of the Chiltern Hills and the railway beneath it, that's right isn't it?

156. MR MILLER: Yes, it's quite a rolling topography of agricultural fields and I think on our site visit, for those who attended it, we came up to this track here, to the

vent shaft site – not quite the vent shaft site, we couldn't quite get up there, but I think that people will have got a good idea of that sort of broad rolling landscape in that southern section of the Chilterns as the route is passing deep within the ground to the south. You can see the more built up areas of Chalfont St Giles, Chalfont St Peter, and you've got then the sort of outskirts of Amersham, which are not quite shown on this plan, a bit further up in this sort of area?

157. MR MOULD QC (DfT): If we go to P7388? Quickly just walk through?

158. MR MILLER: Yes, you can then see it, Amersham which is the historic end – and so it gets more built up as you go further back. So what's tucked in and immediately adjacent to the area of outstanding natural beauty itself is quite built up; and we're avoiding all of that because of the way we're looking at the topography in the tunnelling. Then, when you get into this part of the Chilterns and we're in the area of outstanding natural beauty proper here, Amersham - which is a very historic part of Amersham here – I think it's perhaps worth saying that back in – for the consultation we had a route which was slightly different here, which came up in a playing fields just north of Amersham, in a very deep cutting; the remnants of the old registered park and garden, associated with Shardeloes and the house we saw on the hill in one of the slides the other day. And through time, what's been happening is we've looked at the merits of various cases that have been brought forward to us, and in that particular instance, we were talking about the underlying geology and the groundwater conditions there. What we were learning was that there was quite a lot of fissured chalk and perhaps more risk in the area than the route that we've got now. We shifted the route further south. What that meant is that we then extended the tunnel here because of that consideration; so you get a longer, bored tunnel which then ultimately comes up in the Mantle's Wood area.

159. So this is, I suppose an illustration, as through time, as our knowledge becomes greater, that we have taken on board people's concerns and people's issues and the mitigation or compensation, if you will, is inherent, is built into the design thinking, and in this instance, that has resulted in a longer bored tunnel.

160. MR MOULD QC (DfT): You can see the railway rising up – this is Mr Blaine's gradient – as we come up to the portal at Mantle's Wood, and then if we go to the next slide, we're now coming into the surface section; and you're going to look at this on a

different set of plans in a moment, but we can see that the topography changes can't we as we pass along?

161. MR MILLER: Yes, what's happening here is you're getting into the long valley across the Chilterns itself, and we drove a fair way through that, on the A413, and I think we stopped the bus to just have a look at the field where the vent shaft at Little Missenden was going to be, before going into Little Missenden. So I think those who were on the visit got a fair idea of what that long valley is all about. Of course there is topography; there is the natural ground form which is one thing, and all the features which are associated with that. Then there's the valley floor with the River Misbourne that we heard about yesterday from the Chilterns Society. Then of course, there are other things that are going on: people live in the Chilterns, and living within the Chilterns means that they're on top of the dry valleys, the plateaued part of the Chilterns in this area. People live and we went up to see the people in Hyde Heath and then over to South Heath. So there are two places where people live there. So, fixing your route through here, is not just about the natural landform and the natural landscape, it's about where people live and what that means for people in the Chilterns. Then further down in the dry valley – sorry, in the long valley, we have Little Missenden which is a very attractive village; I guess it was a staging post at one stage for the road.

162. MR MOULD QC (DfT): Sorry, I'm taking you on to the – descending down into the…

163. MR MILLER: Yes. Then similarly Great Missenden, which is slightly bigger, more grown up, perhaps more well-developed, but it has a historic heart, particularly the Roald Dahl Museum, and people are living there. Back in – before we went into consultation on the route, so the work that we were doing in 2009-10, what was paramount and what was on the Secretary of State's mind at the time, Phillip Hammond, was can we produce a route which can avoid the noise and visual effects of a new railway through the Chilterns. That was the birthplace of the sound lab, which I know that people have been along to, and we took that out on the road show. So, the sound and the visual was being tackled at the very earliest of the stages of our consideration and we didn't move forward until we had convinced ourselves that we could tackle those fundamental issues. So getting into consultation, we faced quite a tough test with the Secretary of State and he was very keen on making sure his duties, I suppose, through

the AONB was being effective.

164. Then, going into the consultation, we had a route which looked a little bit like this, and taking up people's views, we started to think, 'Well, what else does this mean? In consultation, we had a shorter tunnel at South Heath, for example, and a shorter tunnel at Wendover. Following the consultation, we further reflected on that and in the route refinement exercise that was carried out, again, with the new Secretary of State, Justine Greening, we looked at that very carefully; thought about the consultation, and the result of that was to extend the tunnel at South Heath and Wendover. The reason for that was two-fold. We looked at the noise climate a little bit further, and listened to what people were saying; and could we, at South Heath not only deal with the noise climate by extending it to the village edges, but also could we maintain continuity of the roads. You can't really do that in the construction of the scheme, but the permanent scheme, the idea of that is to bring that back and maintain a continuity of the landform, insofar as it stands at the moment, albeit there will be changes as a result of the railway.

165. Then at Wendover, we changed the plan, I think quite a long extension of the tunnel, I think it was 700-800 metres at the time. Again, taking that to the end of the extent of the closest properties in Wendover. I know that this week we've been talking about properties which are further back, further eastwards which then extend further forward. But our consideration was those that were likely to be most affected were the ones which were sat alongside the existing transport corridors there, if they were affected at all. So, what that meant was that we ended up with an extended tunnel, albeit that that tunnel was a little bit more like your Hornby Railway set, where you sort of put a tunnel over the railway rather than it cutting through the ground; and that's why you see a raised structure in that location; and that's what we've been talking about.

166. So things are changing through time in response to the consultation. And we did further consider additional tunnels at that point and I think that that consideration was taken up when the decisions of the next steps documents was published and the announcement to proceed with High Speed Rail Phase 1 took place back in early 2012.

167. MR MOULD QC (DfT): That was the document I showed an extract from in relation to economic appraisal with Mr McCartney on Monday.

168. MR MILLER: And of course the next step really was to think about getting a

route together and to bring it before Parliament to test the principle of High Speed Rail, and that's been done. And essentially that establishes – I think Mr Mould has explained that – the need case for the railway. And in doing that, that came along with not only the draft legislation but an extensive environmental statement. And through that process, what we're looking at is: can we further understand the environmental effects of the scheme – and that's what we've done – and what is it that we need to do to further reduce and further ameliorate those effects, either overcoming them entirely or addressing or moderating those to keep those impacts at a minimum?

169. And I suppose that goes to the third element of the approach that we've taken within our response to the Area of Outstanding Natural Beauty. And I think in the time that we've taken in producing the environmental statement, what's on the current Secretary of State's mind is: what is the quality of the design through this? So in taking up where Philip Hammond left off, where Justine Greening left off, Patrick McLoughlin is championing the next step; and the product of that is the development of the design panel, the encouragement of green infrastructure and can this be a green corridor and we must have a legacy through the structures that we are going to provide. And we have set out how that will operate in our information papers, and I think the one to look at is the information paper D1 where we highlight key structures along the line of the route as deserving of particular attention. And there's no doubt here that in Wendover, dealing with the structure that pops up with our scheme, that a lot of effort will be taken to make sure that structure fills well in the landscape.

170. So in describing the rest of the route from South Heath where we've got a now extended tunnel following the consultation, what we have is a series of cuttings of various depths. They range in that just by Hyde Farm the maximum depth is just over 22 metres.

171. SIR PETER BOTTOMLEY: Why don't you point just to help?

172. MR MILLER: Yeah, sorry.

173. MR MOULD QC (DfT): You want to go on the larger scale.

174. MR MILLER: Yeah, sorry, we need to be on the other map.

175. MR MOULD QC (DfT): Yeah, shall we go to 738(3) please?

176. MR MILLER: We need to go actually to 738(5). You'll remember that we walked through Mantels Wood and then we went into the first dry valley looking down into where the Chiltern line is. And so that's in this area here. And then Hyde Farm is just there. And there's a deep cutting just there. You can just see it in that area. So that's really the deepest cutting; it's 22.5 metres at this point.

177. And then the next deep cutting is at the other end. It's just in there. Do you see where the words 'King's Lane' are? Just go down a bit. That's it. Just in there; that's about 18.5 metres before it comes out and there's a bit of embankment at Jones' Hill Wood there before you go on to the structure which goes to the Wendover Dean dry valley.

178. So Mantels Wood deep cutting there, Hyde Farm. Then we're into the Chesham Lane road realignment. Then we're into the cut and cover tunnel there, so it's not a bore tunnel there so it's putting material back in over the top. Then we go into cuttings all the way through up to the point where we get to that embankment of various depths. And then there are various road alterations and we've seen some of the roads which are a sunken lane kind of nature. Some of those roads we keep aligned, some of those we have to shift a little bit. And what we've then done is included material on the side which builds up the land where we think that has good effect from a visual screening point of view or a noise perspective. There are hedgerows through there. There are spinneys and additional woodland included through there that sort of tuck into the remnants of this land and that sort of thing. And the aim of that is to try and go with the grain of the landscape as it is at the moment. And that is blocking woodland in those three areas of woodland: Mantels Wood, Sibley's Coppice and Jones' Hill Wood. And that is emulated along the line of the route.

179. MR CLIFTON-BROWN: Can I ask you: what is on the edge of these cuttings? Is the whole line fenced from a safety point of view?

180. MR MILLER: Yes, it will be. The fence line hasn't finally been decided and it may seem a bit of a strange thing to say to you but the fence line will finally be decided at a much later point. But I think in terms of the cuttings there will be a fenced line towards the top of the cutting. I know people are concerned about the security fences

which are seen alongside these high speed railways but I think it may well be in the detailed design that we can look at that to see whether we can put that high fence perhaps just a little bit off the top at the crest of the cutting slope rather than having it as an exposed feature.

181. The alternative might be that you have a fence where you sort of have a fence and a hedgerow so that you double up with your security. And perhaps, I don't know, whether it's a blackthorn hedge of whatever that helps with the security and actually helps with the look of the thing as well. That might be a possibility as well. So that's to be decided. Clearly, going through an Area of Outstanding Natural Beauty, what you don't want to do is expose very urban looking structures in a broad sense in the landscape.

182. MR CLIFTON-BROWN: Don't you think these fences are going to have to be quite big to stop children and so on climbing over it?

183. MR MILLER: It will be, yeah. I'm about two metres high when I stand up so it's going to be a little bit higher than me, and they do tend to be a palisade fence type of fence.

184. MR CLIFTON-BROWN: Say that again?

185. MR MILLER: A palisade fence; sort of the zinc-coated kind of fence alongside the railway.

186. MR CLIFTON-BROWN: It's not going to look very natural.

187. MR MILLER: No, that's why I say to you that the positioning of that fence needs to be thought about in the design. So you've got a cutting slope like that; you could put it right on top and everyone sees it or you could drop it down just below that cutting slope and perhaps just have your hedgerow or your tree planting there, and you get your security tucked into the railway environment I suppose rather than on the external part of the wider environment.

188. MR CLIFTON-BROWN: Right.

189. MR MOULD QC (DfT): Mr Miller, if you just pull your chair back a bit because

I'm conscious that Mr Hendrick is looking at your back.

190. Thank you. We have a plan on which has the Wendover Dean Viaduct and we had a question earlier about the treatment of that viaduct and how one might mitigate it. I'm tempted to give an answer but it probably comes better from you. Is there anything that you wanted to say about that at this stage?

191. MR MILLER: Well, as I mentioned, it's clearly a key structure in the landscape here. And I mentioned the information paper D1: it highlights what we would do with a viaduct structure here; how we would consult with local authorities; and how we would bring forward information to inform local people. So there is a job of work to be done here that will bring forward designs in a pre-submission arrangement before we go and get the detailed consent for the structure itself.

192. MR HENDRICK: So you're going to give options as such?

193. MR MILLER: There may be some consideration of options here. I'm not sure exactly how that would work. We have set up a design panel that will help inform that process so you could envisage options for the viaduct here. I think what we'll be attempting to do – sorry, what we will be doing – is looking at how to get that consent and what's the best way of dealing with that. At the moment the scheme before you gives us Dean's planning permission. Essentially you can look at those as being an outline kind of permission. And there's more to come. So there's rules of the game. There's a planning regime within the Bill itself and there are what are called 'environmental minimum requirements'; these are fundamental undertakings by the Secretary of State which says the effect will be no greater than that reported in the environmental statement and the adverse effects of the scheme will be further reduced. The planning regime enables that process to take place and enables the detailed design to be brought forward to local decision makers. And whilst there is fairly narrow remit on the matters that are to be considered in the detailed design, those will be taken up by the relevant district council and they will expect in pre-submission, certainly in this instance, material to have come forward to them. They would want the Chilterns Conservation Board no doubt to have viewed that information and that local people will have seen that information as well before finalising those arrangements.

194. MR HENDRICK: It's not a great deal about process but I think, like

Mr Clifton-Brown, I was particularly interested in the idea behind the design. Is it meant to minimise the visual impact of the viaduct or is it meant to be an attractive feature in itself which could add something? I think that was what Mr Clifton-Brown was saying earlier.

195. MR MILLER: I think it's both of those. I think that if this route is pursued then first of all you've got to look at it from the wider landscape perspective: how does it fit into the landscape? And I think that we would be sitting down with Chilterns Conservation Board and the local authority to work out what the objectives are for that to get a common feeling of what the outcomes should be and to put that forward to our designers. We would then need to think about what the designers bring to that design and we are expecting high class designers to be on this job; that's why we set up a designer panel. And there'll be further scrutiny from our point as well as from the local authority end to get these structures in place in the right way. There may be considerations of noise; how do we best accommodate that? You may put in solid noise barriers or you may put in clear noise barriers. There may be some innovation within the designs that account for that.

196. We have seen in this Committee before that the structure which went over the Medway Viaduct on High Speed 1 is a very high quality design. That was looked at at the time by the Royal Fine Art Commission. We've done something different by setting up a design panel to provide further scrutiny. I personally think that's an elegant structure. I know others have a different view, but a lot of effort went into that to come up with a design which visually linked up in that instance to the Area of Outstanding Natural Beauty across the valley of the River Medway itself. So these things can be done and high quality will be provided in this instance.

197. CHAIR: What we don't want is identical designs all the way down the line because everywhere we visited, whether it was Northamptonshire or Warwickshire, there are certain local characteristics. And the people that live there have to look at the things and where possible it's to try and blend in, even if it means facing a concrete design or brick or whatever, so there is some thought going into that.

198. MR CRAUSBY: It's not just about design, is it? It's about cost as well. I mean, there's a huge number of viaducts and some people will consider the destruction of

certain viaducts as an absolute crime.

199. SIR PETER BOTTOMLEY: The Ribblehead Viaduct, for example: if everyone who signed the petition had actually travelled on the train it would have been a profitable line.

200. MR CRAUSBY: So where does the cost come in? I mean, there's the Wharfe Valley Viaduct for instance between Leeds and Thirsk which is considered to be a national treasure. And then there's the steel Thelwall Viaduct which is a completely different animal.

201. MR MILLER: Well, here I think the clue is in the sensitivity of the location. And the effort that will be put in here, as we've set out in our information paper, is all about the sensitivity of the location. There is no doubt that this is going to change the landscape. We're laying down a piece of nationally important infrastructure in a nationally important asset and that warrants a very high quality of design, and I think what we've said is that that is what is going to be achieved. And I can't tell you at the moment precisely what that is – that is to come – but we have set up, I believe, the right mechanisms to enable the right people to come forward to inform that design. And we're not going it alone. We will be thinking carefully about the money in the scheme here but I think there is an extra effort in this particular structure that is warranted, and it's not the more standard form of design that perhaps other projects have seen.

202. MR MOULD QC (DfT): I've put up this image on the screen. It's obviously an aerial image but it gives you a sense of the reach of the landscape setting, if you like, within which the viaduct will sit. And I put it up because I wondered if you wanted to say something also about the opportunities that exist through the restoration process. We heard from Mrs Kirkham that there's quite a substantial area of land that's going to be affected by construction of the cuttings, the construction of the embankments as you approach the viaduct. I mean, in a sense, is there any constraint within Bill powers or Bill limits on using that land for restoration purposes in a way that sits most effectively and integrates within the existing landscape setting?

203. MR MILLER: Well, there is a restraint in the sense that there is an outer boundary in which we'll be taking the land which is necessary for the railway purpose. That's not only the railway itself but it's the railway and how you mitigate or otherwise

compensate for the effect of that railway. So within that I think it's fair to say that there is quite a broad swath of land within that red line boundary. And our view on that is that we need to think about what is the landscape design approach. We've set that out in broad principle and brought that forward to this Committee in the Colne Valley discussion. That runs true for the Chilterns as well as the rest of the route.

204. We've also then thought about, well, what would the next step actually be? And that is sitting down with those relevant people and relevant organisations and thinking about the objectives for the response. So if this route is taken up we will need to think about the landscape outcome. So our land provides a framework for that. We've got an idea in the environmental statement of what that might look like. But the final decision has got to be taken in light of the planning regime and that will mean that we will look at the grain of the landscaping further. So I think in Mrs Murray's evidence there was some concern about the field structure. Well, let's see if we can put the hedgerows and that sort of thing back into being within our land to emulate that field structure in so far as we can.

205. Where we've got landscape earthworks adjacent to the railway, we should be thinking about that raised land in much the same way as the field structure is at the moment and get that field structure back into productive use for agriculture. We should be thinking about the woodland, semi-natural ancient woodland, in Jones' Hill Wood, Sibley's Coppice and Mantels Wood and thinking about that in terms of a blocky kind of structure in the way that it comes about in the Chilterns alongside our railway tying up with the hedgerows and creating connectivity for our wildlife. So all of that is possible within our red line boundary.

206. MR MOULD QC (DfT): Can we turn to perhaps two more photo montages just to give a sense of locations from which witnesses for the petitioners have highlighted concerns? And the first one is P7425(4). This was a location which Ms Daly mentioned earlier. This is from the junction at King's Lane I think or thereabouts. And we're looking down from that property, that white property or broadly in the vicinity of that white property that the Committee saw earlier, looking down into the Wendover Dean Valley. And I don't know if we can zoom in a bit.

207. MR MILLER: Committee members who were on the visit will remember that we

met with all of the cyclists and others at that point and we went into the lady's garden – I've forgotten the lady's name – but it was at that point where, Sir Peter, you were given an arrowhead.

208. SIR PETER BOTTOMLEY: It wasn't me,

209. MR MILLER: And so here we're looking down across that landscape. There is no doubt there is a wide view there. And what we've done is layered in the viaduct itself and it's taken on a very grey kind of outlook there but you can see it in scale at the point where it crosses the dry valley.

210. SIR PETER BOTTOMLEY: The distance is roughly how far from the petitioner?

211. MR MILLER: If you just move it up a little bit so I can have a look at the plan. I should imagine that's about a kilometre. I don't know whether anyone would argue with that on my team. I think it's about that. So what the viaduct is doing here is it's sort of following the dry valley edge of the River Misbourne going up to Wendover just to the right there. And you can see that the ground is obviously higher on the far side there, sort of Dunsmore and Great Missenden.

212. MR CLIFTON-BROWN: Sorry, for somebody who wasn't there, how far up the right? The viaduct appears to disappear behind those trees. How far does it actually go?

213. SIR PETER BOTTOMLEY: It's the fold of the land.

214. MR CLIFTON-BROWN: It's a fold of the land?

215. MR MILLER: Yeah, the viaduct is about 500 metres. I don't know if we can get the arrow to just go there. Yeah. So it's about there. And the viaduct finishes about there, I believe.

216. SIR PETER BOTTOMLEY: So you can see about two-thirds of the viaduct.

217. MR CLIFTON-BROWN: Right, okay.

218. SIR PETER BOTTOMLEY: From this position.

219. MR MILLER: And what's happening there is that obviously it's sort of coming off of that dry valley side and it's descending down into, and having a closer

proximation with, the bottom of the long valley. And when you get to the south of Wendover, that photograph where you can see all the lampposts for the roundabout there, all of the different bits of transport infrastructure and the pylons and everything is converging at that point.

220. SIR PETER BOTTOMLEY: You've got the electricity thing, you've got the low voltage electricity lines, you've got the two houses we were shown and you've got the lights for the roundabout?

221. MR MILLER: Yes. There's a demolition down there. Sorry, I forget the farmer's name but there is a demolition down there. And then it's on an embankment and false cutting through there before you get to the road. We go over the road before you skirt the edge of Wendover.

222. MR HENDRICK: If we go to the previous slide –

223. MR MILLER: Just to remind ourselves of it. We're moving eastwards but we're at a point closer to the viaduct. Yeah, there we are. That's a very familiar image. So we're now looking sort of north-westerly direction across the viaduct. And, again, if we can zoom in. This was an early architect's view of what that viaduct might look at; it's obviously not a detailed design but a visualisation of what that might look like. And on that you can see the train, you can see the noise barriers on there. On High Speed 1 we designed a very low noise barrier which had very good noise attenuation characteristics without having to get height of the barrier. So there's always a danger that you end up with a very deep depth of structure and then you add a barrier on top of it, and on the Medway Viaduct it's got quite a low barrier which performs very well.

224. SIR PETER BOTTOMLEY: Are you going to remind us of the three elements of noise you get from trains?

225. MR MILLER: Yes. The principal noise comes from where the wheel and the rail touch each other. And that principally comes from the leading bogies of the train itself. There is an aerodynamic element which comes off of the train itself as it punches through the air. And then there is an aerodynamic element which comes from the catenary; that's the equipment which takes the power off the –

226. SIR PETER BOTTOMLEY: Pantograph.

227. MR MILLER: Sorry, the pantograph – you're right – off of the catenary line. So the power is an overhead electrification.

228. SIR PETER BOTTOMLEY: So a low barrier starts dealing with the bogie noise.

229. MR MILLER: That's right. And the latest innovations on the trains are to try and avoid all of the blunt parts of the train as it's passing through the air. So between carriages modern trains now have a skirt in between them which is a rubber thing which goes around them. Doors have ceiling mechanisms to keep them flat to the surface edge of the carriage itself. The latest Japanese trains have noise barriers built into and alongside the electrification equipment. We're looking at that at the moment. And then the electrification equipment itself on top of the trains, if you've ever travelled on the Eurostar train there are two sets of pantographs to take up the two different overhead power supplies in the UK and on the continent. So there's a lot of what you might call gubbings on top of the train which punches through the air. That's all now being ironed out and simplified. So it sort of has a 'Z' shape to take up the pantograph and those have been smoothed out and made more aerodynamically efficient. Materials like ceramics are used to actually absorb noise on the leading edge of pantographs and then the well of the pantographs where the electrical equipment actually transfers the power to the wheels, that's all then now shrouded and has been simplified as well. So the latest trains are very simple in terms of the outside architecture of the train.

230. SIR PETER BOTTOMLEY: Which makes a difference?

231. MR MILLER: Yes.

232. MR CLIFTON-BROWN: Do you have a trouble with reduced speeds.

233. MR MILLER: No. The route is generally designed for 400 km/hour. The general running speed is going to be about 320 to 330. In this section it's going to be about 320. So, no, once you get going you should really be getting going. There are headway speeds further beyond of 360. The reason why you're constrained to 320 / 330, I think, through here is because then you're descending down towards a tunnel or you're coming out of a tunnel and you're sort of speeding up, I suppose, to get out of the Chilterns

itself.

234. MR HENDRICK: What's the relation between the speed and the noise?

235. MR MILLER: I'm probably not the right person to ask. I'm not the noise expert. It does go up. And I think maybe Rupert Thornely-Taylor, who is our expert, is probably best to describe that.

236. MR HENDRICK: I'm just wondering if you can get a train through quickly with a shorter burst of more noise. Is that better than having a slightly slower train where the noise is of a longer duration?

237. MR MILLER: It will be going fairly quick. The pass-by I imagine of any one location, you're probably looking at about maybe 24 to 25 seconds as it passes by.

238. SIR PETER BOTTOMLEY: You're going at 6 kilometres a minute, aren't you?

239. MR MILLER: Yeah. I need to work out my maths.

240. SIR PETER BOTTOMLEY: 360.

241. MR MILLER: It's not a great deal of time.

242. SIR PETER BOTTOMLEY: So you can hear it for 25 seconds, you say?

243. MR CLIFTON-BROWN: That's right.

244. SIR PETER BOTTOMLEY: 20 seconds or 25 seconds is not going to make an enormous…

245. MR MOULD QC (DfT): And we did hear from Mr Thornely-Taylor quite early on in the process – possibly at his presentation – that if you're going to look to reducing the speed of the trains to secure any appreciable reduction in noise you're going to look at a fairly significant reduction in speed.

246. MR MILLER: Yeah.

247. MR HENDRICK: So there's no great benefit then in reducing speed?

248. MR MOULD QC (DfT): Yeah, not to a level that it would still be a genuinely

serviceable high speed railway train.

249. MR MILLER: Yeah. Following the consultation back in 2011, we did review route alignment and we did review speed as well. And that's correct: we couldn't see any significant improvement by going slower. Because I think we were talking about a marginal difference when we're looking at that level of speed.

250. MR HENDRICK: So whether it's 20 seconds or 25 seconds it's not a big deal?

251. MR MILLER: No.

252. MR CLIFTON-BROWN: But if it happens every three minutes it's a big deal, isn't it?

253. MR MILLER: Yeah, I mean we've heard this week about the maximum noise events and, yes, there are maximum noise events arising from our train. And we've described those in the environmental statement. There are also maximum noise events which occur in the environment anyway. These are the things that we face everyday just walking around in the streets in the places where we live. So this will add to that but, again, I think maybe you need to hear from Rupert Thornely-Taylor about it. Our principal measure is to look at the LAeq, and that's looking at the total energy over a period of time and what that actually means if you receive that noise from the transport infrastructure that we're planning. And so you will see plans where we talk about lowest-adverse-effect levels and our policies to try and get back to that lowest effect level and minimise noise as far as we can.

254. MR HENDRICK: I presume, because the track is elevated, the noise will travel much further and will be less attenuated by the landscape.

255. MR MILLER: That can be true. There's also a shadowing effect where you get these structures where if you're close in proximity you may be in the shadow of the structure itself. So you've got to look at the noise characterisation of that whole three-dimensional perspective all of the time and that's what we do through the environmental assessment work. So the results of that are the product of all of that consideration and I think it's worth then looking at the results of that and then testing whether you need to put any further noise barriers in.

256. And so what we heard yesterday was a bit of a debate about the LA max events around the church and the school, and what we're saying there is that there are LA max events in the environment anyway because there's a road, there's a railway and things going on locally. You know, if you get crowds of people your LA maxes go up, that sort of thing. That's not inconceivable with the sort of community nature of a church or a school playing field, that sort of thing. So there's a lot going on. And then we do add to it but we add, I think, in part to that with the train pass-bys.

257. MR CLIFTON-BROWN: Can you just remind us what hours this is going to run from and to?

258. MR MILLER: I'm sorry?

259. MR CLIFTON-BROWN: What hours this will be running from and to.

260. MR MILLER: I think the trains start up at 5.00 but they run in service from 6.00 until midnight. And at the back ends of the day it's sort of a start up and finish kind of service. But you can reasonably assume that in 2026 we will be running up to 14 trains per hour in each direction on Phase 1; and when Phase 2 comes into effect that goes up a notch as well, and that's when in 2033 you get your 18 trains per hour in each direction. And although Phase 1 doesn't operate quite in that way, we're planning for that full future operation.

261. MR MOULD QC (DfT): I've just put up on the screen the noise contour map which shows you the spread of noise from the train on the Wendover Viaduct which is being pointed at now. And you can see that the contours of course reflect the spread of the noise before one gets to the full extent of the lowest-observed-adverse-effect level, the LOAEL. And we can see that there is a greater spread of noise on the viaduct as compared to, for example, the railways it passes eastwards into deep cutting. But you can see there is King's Hatch. Those are the properties. It is about a kilometre away, by the way, the distance.

262. MR MILLER: Yeah.

263. MR MOULD QC (DfT): You can see that the LOAEL contour doesn't extend as far as that little hamlet there. And also just it may be helpful, Mr Clifton-Brown, just to

see that the noise assessment for night-time runs from 11.00 in the evening to 7.00 in the morning, and we obviously have more challenging threshold for significance in the night-time hours as opposed to day-time. You can see that reflected in the copy. It's less than 40 dB which is the threshold for night-time and less than 50 for the day.

264. MR MILLER: What's happening there is that your day-time noise level are all the maximum events and average energy events that are taking place that would feature in everybody's lives each day. As you get to that evening situation, all of that activity kind of tails off and that's why we look at it slightly differently.

265. MR MOULD QC (DfT): Can we just go to P7425(1)? Because, just to complete the picture, we've been looking at the viaduct in the landscape from the northern side of the line and here we have a view from the southern side. You can see this is another relatively long view from the southern side of the valley to get a sense of the viaduct within the valley landscape. And there it is sweeping across.

266. MR MILLER: That's right. What we've looked at here is we've identified views where we think that the railway will be most exposed within the Area of Outstanding Natural Beauty. This is obviously a long view but you can see the viaduct there. And if you go to the viaduct edge you can see the dry valley sides where tucked in you can just see the pylon route actually, and that's a broad indication of where that railway is going. But if you draw a straight line from the viaduct across, you can see that the railway is actually tucked into a cutting into that landscape. So on those broad views you're not going to see the railway. I think it's true, though, that you will see it. You can obviously see the viaduct here on that broad view. And you will see cuttings and embankments when you're in close proximity to the railway.

267. Now, I know the Committee have been down to High Speed 1 and we've seen a photograph of the North Downs Tunnel portal which I think was in Ms Kirkham's evidence. And that viewing point was on a footpath which leads up to the Pilgrim's Way on the North Downs. And in that instance you're right on top of that cutting as it leads into the tunnel portal. And so there is no doubt that that sort of close proximity view will occur when we're in that open cutting. So when you're right on top of it there you will see the railway; there's no doubt about it.

268. MR MOULD QC (DfT): We've been focusing attention on the location of the

Wendover Dean Viaduct and the railway as it passes from the south-east area down into the valley floor. I wonder if we can just turn to another document just to move us along briefly a little further to the west. And first put up P7409(1) please. First of all, just tell us what this is.

269. MR MILLER: This is a document I briefly touched on a few minutes ago. I talked about the landscape design approach which is our over-arching more detailed approach to the landscape and the landscape outcome for High Speed Rail. That's sort of developing a manual for doing this sort of thing, I suppose, for the landscape response. What this is doing is taking a more focused look on the Chilterns and it's our draft. We had something similar for the restoration plan in the Colne Valley. So as we move out of this outline sort of position that we're presenting here today and we move into the detailed development, meeting the requirements of the planning regime, that will be further informed by some more detailed considerations setting out what the local objectives might be in the Chilterns. So this is our sort of first attempt at that and this is the sort of thing that we will be preparing as we go into the detailed design.

270. MR MOULD QC (DfT): And if we turn on to page 34.

271. SIR PETER BOTTOMLEY: I'll just stop you there. At the moment we're hearing petitions from the community groups, the statutory agencies and the elected councils asking for a long tunnel. If it turns out that they don't get the long tunnel, presumably HS2 will be consulting with them on this and involving them and requiring planning permission from at least the statutory bodies?

272. MR MILLER: From the district council, yes. That's the way the planning regime works and that will be informed by a number of others. So we've talked about stakeholders and I would see the Chilterns Conservation Board as being an essential stakeholder here. I daresay that will also include the societies; that will obviously bring a lot of the local colour and local understanding of the Chilterns to bear. So we're not going to ignore all that. I think we generally have a good relationship when we've had these sorts of discussions. So, yes, that will all come about. So if a decision is taken not to pursue a tunnel I would expect to almost immediately get on with these sorts of discussions. What I'm presenting here is our own view on what that might look like. I have no doubt it'll change a few times.

273. Yes, moving on from the Wendover Viaduct, this is where the Chiltern railway line comes in and the A413 London road. This is the top end of the Misbourne Valley just before you go through the notch in the ground and the scarp slope up by Wendover. So this is the viaduct and we talked about the school and the church which is down here. And, again, the viaduct will need careful treatment. I think we've already said that we're looking at that and the further landscape through here to think about additional noise attenuating measures to see how far we can get with that.

274. But before we leave, perhaps the rural parts of the Chilterns which Mrs Daly alighted on. I think here what we're trying to show in sketch form is that although we're elevating the land alongside the railway here and the railway's on an elevated embankment, there is always a prospect that we can bring back a structure which emulates to a certain extent the type of landform and the landscape that you see in the Chilterns. It clearly won't be the same but you can take your clues from the landscape that you're passing through, and I think that is the end game for the Chilterns in pursuing this surface alignment. And then going further north –

275. MR MOULD QC (DfT): So 35.

276. MR MILLER: Yeah.

277. MR MOULD QC (DfT): We're getting to the area of the Wendover green tunnel then, don't we, or the cut and cover tunnel.

278. MR MILLER: Yes, that's right. Now, as we're sort of passing by Wendover all of the transport corridors have converged here. The road is dual through this section and you've got the railway, you've got the road which descends into Wendover around the London Road / South Street area. I think we went down there on the bus when we went out there. And we're trying to keep, as far as we can, all of the transport corridors tied.

279. Here you see the tunnel. There's what we call a porous portal at the front there which deals with potential micro-pressure waves to avoid a noise phenomenon. Then you get into a cut and cover tunnel which is probably a short distance between this road here and the roundabout here. That was our original before we went into consultation. That was then extended after consultation. And this is where we've got sort of a tunnel

in the air; this is like the Hornby railway set where you plonk your tunnel over the railway. And then you can see here that we've got landscape earthworks. This will be taking material from the Hunt's Green area which we're changing the nature of the movements of material from the Chilterns, putting that down here and covering that over, greening that over. But it will change the nature of the landscape in this location.

280. MR MOULD QC (DfT): And then if you go to the next slide which completes the sequence actually. We're now broadly at a point where our scheme and the long tunnel converge because this is broadly the area where the northern portal would be located.

281. MR MILLER: Yeah, we viewed this just by Aylesbury Road. There's a little farm access we all have across the busy… I wouldn't say it's busy. People drive quite fast is probably a better way of describing it down the Aylesbury Road and we managed to hop across the road there. And we were looking out over this land. And on this plan you can see where Wendover is and you can see our tunnel is sort of taken up to the closest edge of the northern part of Wendover where people live. And the debate yesterday was saying 'could you move the tunnel further forward?' because further east there are further properties, a further location where people live. But probably a half-and-a-half off of Wendover. The school and the church is just on the other plan. It doesn't show very well.

282. SIR PETER BOTTOMLEY: It's just two inches to the right of the screen.

283. MR MILLER: So, again, this is the area where the loops for maintenance start to come into effect. And so what we're saying here is you've got to build up the landscape, put it on the side. That will probably taper off as you go further north. There is planting where you've got the remnants of land between road and rail, to think about how you fill that in, how you put a green corridor in this location.

284. And then here we've sort of passed into the Aylesbury Vale proper. And so for those of us who went out to Coomb Hill and looked across the Vale, the whole nature of the landscape changes as you come out of the Chilterns. So you're in the high ground of the Chilterns, which we've just been talking about, and it's altogether different as you go north.

285. MR MOULD QC (DfT): Right. Having gone on that walk through the route

from the wood northwards, can we just pick up finally on one or two points of detail? Can we turn to P7416(1) please? Ancient woodland. I think the Committee's seen the numbers in relation to ancient woodland already, but just to pick up on a point which was made by Ms Kirkham the other day that there's relatively little ancient woodland along the route corridor. Do you want to comment on that?

286. MR MILLER: Yeah, I suppose I was a little bit surprised that that was seen as a bad thing. I mean, one of the things that we've been trying to do is to avoid these natural features so far as we're able. And I suppose our consideration of this is that actually through this valley there isn't a great deal of ancient woodland. And we've threaded our route through, as I say, to avoid those places where people live, to tuck it into the valley sides. And actually this part of the route, it doesn't affect perhaps so many ancient woodlands. There's clearly an amount of ancient woodland at Mantels Wood that is affected but through this section where we're on there's actually very little ancient woodland overall in the AONB that occurs.

287. MR MOULD QC (DfT): And then turning briefly to listed buildings heritage. Essentially the same point, I think, is it? We've managed to avoid and keep the impact of those heritage assets to a minimum.

288. MR MILLER: Yes. In the Hyde Farm area, that complex of buildings, there's no doubt that we will have an effect there. We obviously try and avoid the direct effect on these buildings. It's not so easy to overcome the effect of settings on the buildings and the way those building complexes actually work. Further up we talked about Grim's Ditch as well and over the years we've tried many times to play tunes on the route alignment to try and avoid the ancient monument there, and unfortunately we've not been successful with that on this route alignment. But I would say that I think we've done a good job of trying to avoid these heritage features, and in my view the route performs well in terms of that heritage.

289. MR MOULD QC (DfT): We'll probably come back to Hyde End in a little more detail next week but just on the question of stewardship there was a concern to Ms Murray. Can you just confirm the position? We own Hyde Farm house and barn and Sheepcotes Cottage.

290. MR MILLER: We do, yes.

291. MR MOULD QC (DfT): And we either have or are in the process of refurbishing those premises for letting?

292. MR MILLER: We are. And I think we're all agreed on this: the best way to make sure that those properties are kept in good order is to make sure that they're occupied. If they aren't occupied they tend to attract the wrong crowd and we don't want that happening; it's not our approach to make that situation come about. So getting them occupied is the most important thing. Then ultimately people will purchase them and their historic nature, I have no doubt, will be retained.

293. MR MOULD QC (DfT): And in terms of Hunt's Green Farm, the Committee has already heard from the petitioners that the initial proposal for a permanent sustainable placement site within the setting of that farm, that's now been proposed to be removed from the scheme under the additional provision, and instead that material will be stored temporarily and then moved away from the area initially by longer trace and then by lorry from Rocky Lane.

294. MR MILLER: That's right. That's our continued consideration of people's concerns in the area about transport material on local roads and what others call spoil dumpings and to try and avoid that. I think that the temporary situation for roads is overcome because of that so that's a good thing. That's obviously got to be scrutinised at some point but there's no doubt that there will be an effect on the agricultural land. But what I would say is that I think that that would give a very good opportunity to bring that agricultural land back in to productive use as quickly as possible. We've talked here previously about taking care of soils and that sort of thing, making sure that we do that well so that we get the land back and productive as soon as we can after finishing the railway.

295. Clearly by removing that material from the Chilterns it provides a better opportunity or better canvass to bring that back into a shape which is a close approximation of what is there today. And I think that that helps provide an answer to Mrs Kirkham's evidence that, you know, try and go with the grain of the landscape in the Chilterns. So I think that will all help.

296. MR CLIFTON-BROWN: Can I just ask real quick? Presumably in all the property that you acquire, such as Hyde Farm, your aim is to get it sold back into the

private sector as soon as possible? But that presumably is unlikely to be until the railway is actually built.

297. MR MILLER: That's right, yes.

298. MR CLIFTON-BROWN: So you will try and not leave any property empty but try and rent it in the meanwhile?

299. MR MILLER: Yes, that's absolutely right. As I said to you, that's the best way of maintaining the property. Our property teams will look at that property. This is an issue that cropped up where there was concern that the general maintenance of the property wasn't being done well. And I know that's a particular consideration from this Committee's perspective. So we have mechanisms in place to make sure that the upkeep of those properties is put into good effect. That works well when you've got those properties tenanted. And, yes, you're right, the properties will ultimately be sold off. Perhaps to illustrate that on High Speed 1, I mentioned Leeds Castle, that area, the other day. I think it was some 10 years after the railway had come into effect that the final property was sold off. And at that point, as I understand it, that reached true market value at that point albeit that there was a significant time delay before that's realised, which I suppose touches on the willingness to pay type issues.

300. SIR PETER BOTTOMLEY: The major blighting effect tends to have gone almost completely within a year of the operation of a road or a railway.

301. MR MILLER: Yes, that's right because the vast majority of the compensation events have taken place for those people who are being compensated. And, yes, then it takes a period of time. Some of the properties will be sold on quite quickly; other properties will take some period of time. And they do tend to be the sort of country properties because people are looking at those country properties in a way that, you know, 'am I prepared to live alongside a new railway and do I put my money in that direction?'. And it's difficult to anticipate what people's choices are all about.

302. SIR PETER BOTTOMLEY: And in a year or two you get developers asking permission of the local district planning authority to build houses along the railway line.

303. MR MILLER: Well, the classic example of that on High Speed 1 is down at

Lenham where the railway follows a pinch point at Lenham alongside the M20 there, because at the time the M20 was being built out and then the railway came along and then it left land by Lenham. And at Lenham there were a few houses which I think were bought out by the project. Then they were sold on and then the remnants of the land are now being built out. So people are prepared to live alongside roads and railways. You know, people make choices and that's a different choice that people make.

304. SIR PETER BOTTOMLEY: And they're different people often. And the person who's chosen to live in a very quiet area will choose to go if there's a major infrastructure coming in and people coming in know it's there and accept it.

305. MR MILLER: Yeah, and there's an affordability issue there, you know, living alongside a transport corridor but then being in close proximity to the North Downs, that attractive Weald landscape. That's a different consideration. I'm not saying it's going to happen in this location but we tend to focus on the adverse effect of the railway corridor within the AONB here. What does that do? And actually the AONB is much broader and so if you were walking through here you're walking between one place and another place when you're doing the circular route and you may not find that more attractive with the railway in place. But you come across the railway and then you discover woodlands and then you discover different views. You then are on that route which is down in Amersham. The route is in the tunnel there. And there's no doubt that we're going to change the Chilterns in this area and the dynamic of the way that people use the Chilterns will change, but people will find that differently attractive I think.

306. MR CLIFTON-BROWN: Sorry to come back. The Hyde Farm that we saw yesterday, the barn was empty with a security gate on it. You, as managers of property, is it your intention to manage those properties so that they are empty as little time as possible? Because if I lived next to that barn, being empty like that with a security gate on it, I wouldn't like it very much.

307. MR MILLER: The simple answer to that is 'yes'. When we purchase those properties we have to think about our liabilities as landowners so there's some work to be done quite often with the properties to bring them into a situation where we can get a tenant in. That work is then done, things are refurbished or whatever, made safe and whatever, electrics and that sort of stuff. So all that's considered and then you get it

tenanted and we do that as quickly as we can.

308. MR MOULD QC (DfT): And in fact the position is that all but the farm house at Hyde Farm house and barn is actually let, and the farm house is being renovated and a lease is being agreed. And that security sign actually was there before HS2 took over. It's a pretty standard sign, isn't it, on a farm gate: watch out, there's a dog here.

309. Just a couple more things, Mr Miller. You neatly anticipated a question about public rights of way. We've got a series of slides P744(7) through to (50) which show the permanent position in terms of changes to the public rights of way network in the vicinity of the railway line. Can you just give us a headline figure? Of the approximately 2,000 kilometres of public rights of way in the Chilterns, what is the total length of diversion that we estimate?

310. MR MILLER: It's a little over 4 kilometres.

311. MR MOULD QC (DfT): Thank you. No doubt we'll come to this in more detail in later petitions. And then I think noise. Again, we've got a series of slides, P743(2) following. Again, is there a headline point about what we've sought to achieve and our predictions suggest we are achieving in terms of the noise effects of the operational railway?

312. MR MILLER: Well, broadly, what we've done in the Chilterns is to keep the route as low as we can in the landscape. That's why you've got the cuttings and the false cutting type of response. That generally keeps the effects of the LOAELs and SOAELs, is to keep that away from those main places where people live. South Heath, that's the outcome of the green tunnel, the cut and cover tunnel through that section.

313. MR MOULD QC (DfT): Okay. Well, perhaps next Monday or Tuesday we'll come back to that slide and get it turned the right way around. And then finally we know that the Committee has been asked to make a judgement, as we heard earlier from Ms Daly, between the mitigated railway that you have just described. Do you want to say anything about the impacts of that alternative on the landscape or do you think that's sufficiently covered by the material?

314. MR MILLER: Well, I think what we've done with the route alignment that we

presented in the Bill is to think carefully about the actual effects that are occurring in that corridor and what that means in the AONB. We've looked at tunnelling; we've looked at this route sensibly over the years with quite careful consideration. I believe that what we've done over the years means that the environmental response is inherent within the design and that the residual effects are minimal. There are effects but they tend to be localised. We've said already that with some of those local effects that we continue, and we will continue, to address the effects. I think there is then the job of work to further think about that convention mitigation and how it fits in the landscape to the north of the bore tunnel, perhaps to the north or the south-east as we get to Wendover. But broadly the effects are minimal. Those effects will be overcome by a long tunnel but at some considerable additional cost.

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

316. CHAIR: I think we'll come back to you, Mr Straker, with question at 2.00.

317. MR STRAKER QC: Thank you very much.

318. CHAIR: Before we close, let me clarify one aspect of the statement I gave earlier in relation to HOAC. The Committee would like to see HOAC carry on its activities in one place or another but recognise the difficulty of staying on at the current site. Thank you. Order, order. We reconvene at 2.00.