

MINUTES OF ORAL EVIDENCE

taken before the

HIGH SPEED RAIL (CREWE - MANCHESTER) BILL SELECT COMMITTEE

Tuesday, 20 June 2023 (Morning)

In Committee Room 8

A video of the proceedings can be found [here](#).

PRESENT:

Andrew Percy (Chair)
Antony Higginbotham
Grahame Morris
Martin Vickers

FOR THE PROMOTER:

Timothy Mould KC, Lead Counsel, Department for Transport
Tim Smart, Phase Two Managing Director, HS2 Ltd
Darren King, Rail Adviser, HS2 Ltd

Exhibits referred to by the promoter during the hearing with Manchester City Council, Greater Manchester Combined Authority and Transport for Greater Manchester can be found [here](#).

FOR THE PETITIONERS:

1. Manchester City Council
2. Greater Manchester Combined Authority
3. Transport for Greater Manchester
 - Neil Cameron KC
 - Andrew Byass
 - Dr David Simmonds

Exhibits referred to by the petitioners during the hearing can be found [here](#) (part 1) and [here](#) (part 2).

IN PUBLIC SESSION

INDEX

Subject	Page
Greater Manchester Partners	3
Evidence of Dr Simmonds	3
Evidence of Mr Smart	18
Evidence of Mr King	53

(At 9.00 a.m.)

1. CHAIR: Welcome to this morning's Committee of the High Speed Rail Hybrid Bill Committee. We're going to kick off where we left just a few short hours ago and I think it was Mr Cameron. You had a few more questions for Dr Simmonds, I believe. Is that correct?

Greater Manchester Partners

Evidence of Dr Simmonds

2. MR CAMERON KC: Yes, that's right, sir. We were looking at the table but I've got one more question for you, Dr Simmonds, and that is, you've compared the surface turnback station with the underground through station. Which of the two options you've considered performs better against levelling up objectives and why?

3. DR SIMMONDS: My assessment is that the underground station will perform better, primarily in terms of the additional land which is made available for development, and the expectation that that can be put to good use by locating more employment, a higher proportion of employment, in a location which offers very high access to economic mass, will produce productivity benefits, with a significant amount of residential development very close by. There are also arguments to do with the potential further contribution of additional through services, though clearly there is a difference of opinion as to their value or whether they can be taken into account at all.

4. MR CAMERON KC: And how do the productivity benefits contribute to levelling up?

5. DR SIMMONDS: Basically, that levelling up is supposed to involve enhancing the productivity of the areas that need, deserve, levelling up, not just to do so by relocating activity from other parts of the economy but by actively enhancing those areas, and through the agglomeration effects, which we've described yesterday, that is how it will contribute.

6. MR CAMERON KC: Thank you.

7. CHAIR: I just have a couple. So, Dr Simmonds, I think on the slide that we saw yesterday, all of your benefit cost ratio analysis showed a BCR of 1, apart from where

there was a seven-year delay, if I believe I'm right. Everything else was above 1. Am I correct in saying, just so I've got this right, HS2's own BCR is 0.7 for this project, did you say in your – I wrote that down.

8. DR SIMMONDS: There are a range of figures but I believe the central estimate in the latest update of the SOBC, the strategic outline business case, the central figure was below 1.

9. CHAIR: Below 1, okay. But in terms of the issue of levelling up, which is very hard to define in any event, I mean, your contention is, whether it's the surface station or the underground station, there's economic benefit and a levelling up to benefit to Manchester regardless.

10. DR SIMMONDS: Sorry, could you –

11. CHAIR: So, however the station is constructed, above or below ground, it is your view though that there's an economic benefit to Manchester regardless.

12. DR SIMMONDS: Yes.

13. CHAIR: So levelling up occurs on a scale regardless.

14. DR SIMMONDS: There will be a positive effect from HS2, yes.

15. CHAIR: Regardless.

16. DR SIMMONDS: That's what's been indicated.

17. CHAIR: Okay, thank you. Anybody? No? Thank you. Mr Mould, did you have some questions for Dr Simmonds?

18. MR MOULD KC (DfT): Yes, a very few, yes, yes. Good morning, Dr Simmonds. If we put up A65(10), I just want to understand in terms of jobs created – and I say that advisedly because you explained this to the Committee very fairly yesterday that we're not talking about net new jobs to the country. We're talking about jobs redistributed.

19. DR SIMMONDS: That is the assumption to avoid arguments with Treasury in particular.

20. MR MOULD KC (DfT): Yes, and you followed the same approach.

21. DR SIMMONDS: Indeed.

22. MR MOULD KC (DfT): Yes. We can see how you have arrived at your figures on this slide and we can see that in so far – I am going to just take office because that is far the greatest contributor to jobs. We can see on the top line, there is the additional commercial floor space that Mr Lonsdale told the Committee about yesterday, 157,077 square metres. We see that you apply a factor of 12 metres squared in order to convert that into full-time equivalent jobs and we see that that simple process of division leads you to a figure on the top line of 13,090 jobs created.

23. You'll remember, the reference is A82(2), that yesterday, we looked at Mr Lonsdale's own work, which calculated that the additional commercial floor space that would be generated by the HS2 Bill, that is to say the surface station, would be 333,063 square metres of additional commercial floor space. And I've done the calculation, and I'm happy to be told I've got it wrong because my maths is notoriously suspect, but my calculation is that that would generate 27,750-odd new jobs. So converting the Chair's question into jobs created, the HS2 Bill scheme, on any view, can be said to release the opportunity for 27,750 new jobs in Manchester, yes. The question is, is there a clear case for realising the additional 13,090, or take the full figure you have, 13,899, through putting the station underground?

24. DR SIMMONDS: Yes. That is the number, which is relevant to the question of underground versus surface.

25. MR MOULD KC (DfT): Yes, and you could express that in this way, couldn't you? 'Is the additional capital expenditure and additional delay in delivery into service of the new station clearly justified by the wider economic benefits that would result?', which you say are principally expressed in terms of those additional 14,000 odd new jobs.

26. DR SIMMONDS: A little more precise, if I may. It is not just the productivity of those jobs. It is the additional productivity of all the jobs in Manchester, and to some extent beyond, that is brought about by bringing those jobs into this more central location, so that the accessed economic mass, which I talked about yesterday, is

increased, compared with the locations where they would have been. So it is not just the 13,000 jobs but the effect that they have on themselves and on all the other jobs in Manchester.

27. MR MOULD KC (DfT): It's jobs that provide the catalyst for those productivity gains, though, isn't it? Without the jobs, you don't get the productivity gains.

28. DR SIMMONDS: Correct.

29. MR MOULD KC (DfT): Yes. So, we have to remember that levelling up is not a Manchester local policy. It's a northern regional policy, isn't it?

30. DR SIMMONDS: And, indeed, other parts of the country, yes.

31. MR MOULD KC (DfT): Yes, yes. And we also have to acknowledge that the availability of capital funds for investment, in order to support levelling up, must be limited.

32. DR SIMMONDS: It must in some way be limited.

33. MR MOULD KC (DfT): Yes.

34. DR SIMMONDS: Whether particular figures that are expected at the moment are the appropriate limits, that is open to question.

35. MR MOULD KC (DfT): Well, the Government's position is that it's devoted, under the integrated rail plan, £94/95 billion, I think, towards rail investments and transport investments across the northern and other regions that you've mentioned. And so by definition, on the Government's own investment plan, if we are to seek to realise the additional productivity benefits that you've mentioned, and which are the driver for the Manchester partners' case, by devoting an additional, on the lowest estimate, £1.75 billion, on the highest estimate around £5.5 billion, I think, in terms of costs, and an additional delay of between three years and, potentially, 8.5 years in bringing the HS2 transport package into play, then to devote that to the cause that you have identified, we have to accept that that money, on the Government's own current investment plan, would be money taken from transport investment elsewhere across the regions to which the levelling up policy is applied, don't we, on the Government's own current

investment plan of £94 billion?

36. DR SIMMONDS: Yes, and if that is the Government's view then that is the Government's view, though economically other views are possible and there are questions also about what exactly the alternative uses of the funds would be.

37. MR MOULD KC (DfT): Well, they're set out in the integrated rail plan, aren't they?

38. DR SIMMONDS: They are but the integrated rail plan does not include a detailed analysis, particularly does not include analysis of the levelling up-related benefits of the different schemes that are proposed. The point has been made in the statement of common ground that that is something which the Department expects to do in considering individual schemes.

39. MR MOULD KC (DfT): Of course, I –

40. DR SIMMONDS: And the position at the moment, that we do not have comparable measures for the other schemes that are included in the plan.

41. MR MOULD KC (DfT): I mean, I accept, of course, that this Select Committee is not bound by Government policy and if it's persuaded that the Government should think again... Well, it's true. But it's a consideration I think that you would accept the Committee should take into account, isn't it?

42. DR SIMMONDS: I think it is perfectly reasonable. The Committee has to take into account the cost as well as the benefits.

43. MR MOULD KC (DfT): Yes.

44. DR SIMMONDS: Dr Cameron, I think it was, made the point very well last week that it's not very helpful to look at the benefits without considering the monetary bill that is attached to them and that is precisely what the benefit cost ratios do.

45. MR MOULD KC (DfT): Just with this discussion in mind, can we look at A72(24), please? This is part of your report. And if we just look at figure 3.3, you see

you had a table, which is entitled, ‘Regional employment weighted access. Average rail access to economic mass 2011’, and we can see that so far as – if you compare Manchester’s performance in that respect to the north generally, Manchester is clearly doing significantly better, isn’t it?

46. DR SIMMONDS: Yes.

47. MR MOULD KC (DfT): In terms of its current – that’s going to be, as you’ve just accepted in answer to the Chair’s question, Manchester’s position is going to be further improved by the HS2 Bill, whether the station is at surface or underground. Yes?

48. DR SIMMONDS: Yes.

49. MR MOULD KC (DfT): And so if one just scrolls up a little bit to the previous graph, there we can see local authority access to economic mass and we can see that, if you take Manchester as 100 on this index, Leeds, Liverpool, Newcastle and Hull are performing less well than Manchester, in relation to that analysis, yes?

50. DR SIMMONDS: Yes.

51. MR MOULD KC (DfT): So the proposition that’s before the Committee is, Manchester is already going to benefit significantly in terms of job creation and productivity gains from the HS2 Bill, whether or not the station is underground, yes? And Manchester’s case to the Committee is that, notwithstanding that, Manchester should be given yet further significant capital investment in order to further improve its position and I suggest to you that, in considering that, the Committee should consider, what is the risk of that further investment in Manchester taking funds away from those other urban centres, which offer the potential for productivity gains as well? Leeds, Liverpool, Newcastle and Hull are all substantial cities, so offer the opportunity for transport-related productivity gain. Is there a concern about devoting yet further capital investment to Manchester and potentially risking that investment being diverted away from those other four cities? It’s a fair question, isn’t it?

52. DR SIMMONDS: So it is a fair question but not the only question. I mean, the context of the figure to which you have referred, which is on the screen at the moment, is the argument that has been developed by previous consultants working for the

Manchester partners, that essentially levelling up is an enormous challenge, it needs a great deal to be done to it, even just to maintain the position of the north relative to London and the south-east. And, as Mr Lax says in his evidence, this needs to look at inter-urban, inter-city connectivity, urban connectivity, other aspects of planning such as where jobs are located within these cities and this needs to be pursued across the north.

53. MR MOULD KC (DfT): Right.

54. DR SIMMONDS: And that is all that is required simply to maintain the position of the north collectively, relative to London and the south-east, never mind actually achieving any levelling up. So there is an enormous challenge here. But if one takes the view that the amount allocated towards these activities is limited, then the question you pose is a reasonable one.

55. MR MOULD KC (DfT): Thank you very much.

56. DR SIMMONDS: If more is considered to be desirable, as has been shown to be necessary, then the question changes.

57. MR MOULD KC (DfT): Thank you very much. One final point to ask you about and that relates to the BCR calculations. We've seen your calculations, I think in the updated table that you produced yesterday.

58. DR SIMMONDS: A80, yes.

59. MR MOULD KC (DfT): And I think Mr Cameron made the fair and indeed inescapable point in introducing you, that the outputs of BCR calculations are governed by the inputs. Yes. So if we just look at those that we have put forward. They're at P418(44), I think, and I just want to show you one example. You can see, on the top line here, the benefits across the range of a three to seven-year delay, which are the basis for your evidence, yes? £3.6 billion, £2.4 billion. Is that right?

60. DR SIMMONDS: Yes.

61. MR MOULD KC (DfT): And then we have the capital cost estimate of delivering those benefits that you relied on in your report, which for the three year delay is £2.2-3.3 billion, and I think you've focused on that rather than a longer period of delay, haven't

you?

62. DR SIMMONDS: Yes. I did not have any figures for the longer delay so when I did look at the seven-year delay, I did not make any adjustment to the costs. Since the costs could be spread, presumably would be spread, over a longer period, the discounted value would actually fall slightly.

63. MR MOULD KC (DfT): Yes.

64. DR SIMMONDS: I'm not sure whether that is actually taken into account in the figures that we're coming to.

65. MR MOULD KC (DfT): Well, the next line shows the BCR outputs that result from your analysis, that is to say the benefits estimate divided by the cost estimate for the three-year delay, and that gets you to your 1.1 to 1.7 range, which would represent, in your case, if you look at the table opposite, low value for money, yes?

66. DR SIMMONDS: Low to medium, I think.

67. MR MOULD KC (DfT): Low to medium. Alright. You're going above 1.5 on the top end of that range. You're absolutely right. So low to medium. And then we see that the HS2 cost estimate in P424 – obviously that figure has adjusted downwards slightly with P424(3) – but with the figures as they were when we came into these hearings, the HS2 range for the three-year delay was £5.3-6.2 billion and then if we substitute our costs for your costs, we can see the resulting BCR, that is to say, A divided by C instead of A divided by B, was 0.6 to 0.7. That just illustrates how the inputs govern the outputs, doesn't it?

68. DR SIMMONDS: Absolutely.

69. MR MOULD KC (DfT): So if you deploy HS2's costing, including the cost of the turnback facility that we've been debating, you move to, on the table opposite, poor value for money, don't you?

70. DR SIMMONDS: Correct.

71. MR MOULD KC (DfT): And that's poor value for money for the additional capital expenditure. Another way of expressing it is that, for every additional pound of

capital investment, you get, on HS2 figures, between 60p and 70p back. That's right, isn't it, yes?

72. DR SIMMONDS: That's what the figure means.

73. MR MOULD KC (DfT): Sorry?

74. DR SIMMONDS: That is what the figure means.

75. MR MOULD KC (DfT): Yes, yes, okay. And obviously then we've factored in, on the rest of the tables, some other considerations that we've been debating such as the degree to which you could safely assume additional job creation through development opportunities, the passenger journey time impact of moving from platforms, which are as deep as the Jubilee line station at Westminster, up to the surface and back again and so forth. But that's the position in so far as the additional capital expenditure on the surface station is concerned and testing, if you like, the value for money for that additional expenditure. But then you've sought to tie that to compare that, haven't you, with the overall benefit cost ratio range for the Phase 2B scheme, as set out in the update of the strategic outline business case.

76. DR SIMMONDS: Yes.

77. MR MOULD KC (DfT): Yes. You haven't actually produced to the Committee any evidence of the actual effect on the scheme-wide BCR of substituting the underground station for the surface station, have you?

78. DR SIMMONDS: No.

79. MR MOULD KC (DfT): No. Have you done that calculation?

80. DR SIMMONDS: No.

81. MR MOULD KC (DfT): Right. Well, we've done it and we think, on your figures, it improves the overall performance of the scheme by 0.1 of a decimal point. So I think you said that the range – was it 0.7 to just above 1, I think, for the scheme-wide? So it would mean that it would go up from 0.7 to 0.8, if I'm right about that, to 1.1 to 1.2. So it would have a fairly marginal effect. Spending this additional money on Manchester station, on those figures, would have a fairly marginal effect on the overall

economic performance of the Bill scheme, wouldn't it?

82. DR SIMMONDS: I would question that. I mean, another way of putting the figures you've just quoted is that, at the moment, and taking the lower figures, the scheme is going to lose 30p for every pound that is invested.

83. MR MOULD KC (DfT): Yes.

84. DR SIMMONDS: And with the underground station instead, that would be improved to only losing 20p, reducing the loss by one third, so whether one regards that as significant or insignificant.

85. MR MOULD KC (DfT): Well, both would represent, on that analysis, poor value for money.

86. DR SIMMONDS: Yes, and improving from 1.1 to 1.2 would be an improvement.

87. MR MOULD KC (DfT): It would represent low value for money.

88. DR SIMMONDS: It would still be in the range of low value but 1.2 is better than 1.1.

89. MR MOULD KC (DfT): And again, that feeds into the broader question that I put to you that we agree on. It's reasonable to consider that marginal change, if you like, as I put it, or that change, if you'd prefer me not to use the adjective marginal, it's to consider that degree of change in the economic performance of the Bill scheme against the impact of diverting capital expenditure away from transport improvements across the northern region and focusing more of that money on the best performing city at the moment, which is already going to be significantly advantaged by HS2, whether the station is underground or not. That's the overall framework for analysis, isn't it, here? That's the question the Committee has to consider.

90. DR SIMMONDS: It is along those lines, although I think the likelihood that benefits that are generated in Manchester will be distributed more widely should also be taken into account.

91. MR MOULD KC (DfT): Will the people of Hull be persuaded by that, because there are going to be more jobs in Manchester and that will eventually filter down to you

in Hull.

92. DR SIMMONDS: My wife is from Hull and I would hesitate to say that I'd persuade even one person from Hull of anything.

93. CHAIR: You married well, Dr Simmonds. You married well.

94. MR MOULD KC (DfT): Thank you very much, Dr Simmonds.

95. CHAIR: Thank you. Just to follow up slightly on that. I think you accept this, Dr Simmonds, from what we've just seen there, without the creation of an extra pot of cash from the Government for this, is it a fair assessment to say that, without that, investment would have to go from elsewhere to create the underground station?

96. DR SIMMONDS: That seems to me to be a matter of Government policy, that the money is taken from elsewhere, rather than economic necessity.

97. CHAIR: Because unless someone suddenly appears with £4 billion extra to pay for this, then it is a fair assessment to say that money will have to come from rail investment elsewhere in the north or in the country.

98. DR SIMMONDS: If that is the way the budgets work and that is fixed then, yes, I think, that would be the conclusion.

99. CHAIR: In many ways, that's a political question, of course.

100. DR SIMMONDS: Yes.

101. CHAIR: In terms of the 14,000 jobs then, have you done an analysis of how, given there will be displacement to Manchester Piccadilly on your proposals of these jobs, so the jobs coming to Manchester Piccadilly, have you done an assessment of how far, how wide, those jobs would be displaced from across Manchester or the north generally?

102. DR SIMMONDS: The assumptions were summarised in my report and, indeed, in the previous report from which the work is drawn. I don't have the figures at my fingertips. I can search for it or I can look at it afterwards if you wish.

103. CHAIR: I'm just wondering whether it's –

104. DR SIMMONDS: The point was raised yesterday. I'm happy to go back and –

105. CHAIR: No, I'm just wondering if it's a fair assessment to say that some of those jobs could be displaced from Leeds, from Bradford, from West Yorkshire, or is that too far of a radius to –

106. DR SIMMONDS: In the shorter term, it is possible. In the longer term, it is assumed that the continuation of levelling up investment and projects will be drawing employment into all of these more productive locations and that the jobs will be coming from elsewhere. I can go back and get the – there was a specific set of assumptions, which I can go back and extract accurately.

107. CHAIR: Sure. I'm just wondering if it's fair to conclude that we could be in a position, if we go for an underground station, where money is taken from rail investment elsewhere in the north, to create something in Manchester that will take jobs from elsewhere in the north and I just want to know whether that's a fair assessment.

108. DR SIMMONDS: I think if that is what happens to the investment plan, then I think that has to be recognised as a potential consequence.

109. CHAIR: Okay, thank you. Grahame?

110. MR MORRIS: I wonder if you might just clarify that point in relation to the jobs displacement argument. Have you ever done any work in analysing job displacement in relation to freeports, for example, or before that, enterprise zones?

111. DR SIMMONDS: I haven't done it myself, but I am aware of the analysis done by others which suggests that there are very significant displacement effects.

112. MR MORRIS: Weren't the critics of those particular Government policies, enterprise zones, actually promoted by my own party in Government, and freeports by the present Government – wasn't one of the criticisms that it was simply displacing jobs from one part of the country to the other, and one of the counterarguments was that there were certain synergies that bringing them together with the various benefits of Government investment would deliver? Those arguments, could they not be applied in the case of Manchester and HS2 and the underground station?

113. DR SIMMONDS: That is exactly the point that the benefit arises from the jobs being located closer together and in a highly accessible location, the whole access to economic mass argument, which is why I volunteered the point yesterday that we are not talking about created jobs; we're talking about the benefits of jobs being in particular locations and particular kinds of locations. I think in the urban context of drawing jobs into city centres, the productivity benefits are well established.

114. MR MORRIS: Thank you.

115. CHAIR: Mr Cameron, have you anything further for Dr Simmonds?

116. MR CAMERON KC: I have, sir, just one or two. On that point, Dr Simmonds, you were asked about potential displacement and you said that in the shorter term it was possible. Can I ask you about the longer term? What is likely to happen in the longer term?

117. DR SIMMONDS: It should be clear that the assumptions that have been made in estimating these benefits, that they are assumptions. It's not the result of running a formal model, but they are assumptions that – I'm just trying to find in the report – that in the shorter term there would be displacement from other parts of Manchester and elsewhere. In the longer term, as I said, the displacement would be, on the assumption that levelling up policies continue to draw jobs into the most productive locations, the jobs would be drawn from elsewhere.

118. MR CAMERON KC: If this displacement occurs, what is the economic benefit?

119. DR SIMMONDS: It is the economic benefit of locating jobs where both those jobs and other jobs around them, in this case all the jobs in central Manchester in particular, have a higher access to economic mass, which, for the service sectors – which are the main office occupiers – leads to greater productivity through agglomeration effects, as discussed yesterday.

120. MR CAMERON KC: And if you don't do this, can you achieve levelling up?

121. DR SIMMONDS: On the analysis which was done by the Greater Manchester partners a few years ago, by colleagues at KPMG, the answer would appear to be no. Their arguments, which were presented to Government several years ago, were

summarised in Mr Lax's evidence that there is need for the enhancements in intracity, intraregional connectivity, urban connectivity, in location of activities within cities, and to seek the synergies, positive interactions between all of those. All of those are needed just to achieve the – not to even to achieve levelling up but simply to stop the north from falling further behind.

122. MR CAMERON KC: You were asked a question by Mr Mould about transport investment being taken from elsewhere, and you said, 'Economically other views are possible'. What are those other economic views?

123. DR SIMMONDS: That the sums allocated to investment should be increased overall, and this has been a recurrent theme, without wishing to stray into general economic policy, that the UK is simply investing too little, both publicly and privately.

124. Coincidentally, there is a report that's been published on this this morning by the IPPR which suggests – it's a rather eye-catching analogy – that over the past 20 years or so, we should've invested not in one Elizabeth line; we should have been investing on the scale of another 30 Elizabeth lines, just to illustrate what is being said about the shortfall in investment.

125. MR CAMERON KC: Last point to ask you about – you were asked about A65(12), about the BCR. Can we have 65(12)? At the bottom, there's a note that says the central estimate of the BCR of HS2 from Crewe to Manchester is 0.7, and in discussion we've had a range of 0.7-1.1, and we may be able to agree this separately, but the Committee needs the right figure; what's the right figure?

126. DR SIMMONDS: For the HS2 scheme, I can't say exactly which is the right figure. To be precise, I'd need to go back and compare the assumptions that give rise to Mr Mould's range of 0.7-1.1. Sorry to be unhelpful.

127. MR CAMERON KC: We'll do that outside and give you a figure.

128. DR SIMMONDS: For example, and I'm aware that one of the illustrations made in the strategic outline business case is about the impact on the BCR of doing the appraisal, looking at a 100-year period rather than the 60-year period. That basically adds in more benefits, albeit discounted ones, without adding to the cost.

129. That may possibly be the basis of the 1.1 figure that Mr Mould has mentioned. For comparison, if we do that on the underground station versus the surface station, we get the figures, the last set figures in A82, which go up to a range from 1.7 to above 3. We would have to be careful what we were comparing there.

130. CHAIR: Can I just jump in there while Mr Cameron and Mr Byass are consulting? On this benefit cost ratio analysis, you did say a potential consequence – is the question I posed to you – of an underground station at Manchester is removal of investment elsewhere and the displacement of jobs from elsewhere in the north. Those were your words, ‘potential consequence’. Just so I’m really clear on this, a very simple question, is it your contention, though, that an underground station at Manchester is of economic benefit to Leeds, to Goole, to Hull or not?

131. DR SIMMONDS: Certainly, to Leeds, potentially to Goole and points beyond.

132. CHAIR: Right, because of the arguments you laid out earlier.

133. DR SIMMONDS: Yes.

134. CHAIR: Okay. That would be longer term, presumably, because you talked about short term.

135. DR SIMMONDS: Yes, indeed.

136. CHAIR: Longer term, in terms the short-term movement of jobs versus long term. Sorry, Mr Cameron.

137. MR CAMERON KC: No, I’ve finished, sir.

138. CHAIR: Excellent. Thank you. Well, thank you, Dr Simmonds, and Mr Cameron, you’ve done –

139. MR CAMERON KC: That completes our case.

140. CHAIR: Excellent, thank you very much and thank you to all of your witnesses as well for their time and for bearing with us as we’ve flexed the schedule a little bit. So I appreciate that. So Mr Cameron, Mr Byass, thank you very much. We move on to Mr Mould.

141. MR MOULD KC (DfT): Yes, and I'm going to call Mr Smart.

142. CHAIR: Right, yes.

Evidence of Mr Smart

143. MR MOULD KC (DfT): Mr Smart, I don't need to introduce you. The Committee, obviously, have heard from you a number of times, and Mr Cameron and his team, I'm sure, have picked up on your experience.

144. What I would like to do, though, just at the outset, is to understand what your practical experience of building large railway stations and the practicalities and time taken to, not only create the basic structure of the box, the excavation box, for an underground station, but also the fitting out of the station, the internal structures, in other words, converting the box to something that is a station. Give us a couple of examples of that.

145. MR SMART: Okay. Box construction, Jubilee line extension, primarily Canary Wharf station box, but also, to a certain extent, Westminster, that was on my patch for a while. Box construction on CTRL HS1 at Stratford. And also the box which is the current Thameslink station beneath St Pancras International Station. Fitout of stations, Stratford, Ebbsfleet, St Pancras and Thameslink below St Pancras.

146. MR MOULD KC (DfT): What was your position on what was then known as the Channel Tunnel Rail Link scheme?

147. MR SMART: I was head of the client team for the construction and latterly engineering director on the board for HS1.

148. MR MOULD KC (DfT): Thank you. Can we turn to slide P418(16), please? And if we just look at this slide, it refers to the construction of underground station alternatives, and the proposition is that the challenges of construction, the costs of a station at Manchester Piccadilly, are significantly exacerbated when contemplating any underground station due to the additional scale and quantity of construction required and the additional complexity of that construction underground. And then a number of matters are identified there.

149. If we go onto slide 17, there are references made to a number of additional geotechnical risks involved in the provision of an underground station, and they're then itemised on the slide; I won't read them out in accordance with the usual convention.

150. Mr Smart, we know that it's not our case that you – that it's not feasible to construct the underground station that the Manchester partners are putting forward, nor indeed is it unfeasible to construct the six-platform underground station that was found to be the best performing in the SIFT analysis; that is to say the six-platform station known as B1.

151. MR SMART: Correct.

152. MR MOULD KC (DfT): But against that context, can you just help the Committee a little more on why we refer to these items of challenge and risk, please, in terms of construction?

153. MR SMART: Yeah, certainly. And there was a risk which Mr Hindle also highlighted in his own evidence is that, with a box solution, we've got to take the river Medlock through the station, which a surface station avoids doing. And the reason I mention that of course is water and I think that's one of the key things that I would be concerned about.

154. Mr Hindle painted what was quite an optimistic view, in my opinion, of the Sherwood sandstone and if you look at his report, the photographs he's got are all surface features in that sandstone, but if you look at other experience in that sandstone when it's at depth, it's quite different.

155. In the early '70s there was a trial shaft at Manchester Piccadilly and Manchester Victoria, which was going to be the embryo Picc-Vic line, and the shaft at Manchester Piccadilly encountered water at 14 meters and the shaft at Manchester Victoria encountered water at 10 meters, so we know water's there.

156. Also, in the 2010-2015, there's the Preston rising main wastewater project, which sank shafts down 30 meters and they had weathered horizons, which is where previously the rock had been exposed to glacial activity or whatever, and they hit that at 30 meters with cohesionless sand, which meant that they couldn't stop the water coming in the

shafts, so they had to flood the shafts with water to stop it coming in, then ground treat the outside of the shafts to seal it with what's known as jet grouting and then pump it out. I think where Mr Hindle and I do completely agree is that, until we do further geotechnical investigations, we really won't know what the answer is. So my view is you take the prudent view that water's going to be a problem.

157. I'd also cite – and I rather appreciate Mr Hindle's reference to the Boddingtons Brewery –

158. CHAIR: I enjoyed that.

159. MR SMART: As the Committee did I think as well – but what that does show is that, if they're abstracting for brewery purposes, it means water's there and it flows.

160. MR MOULD KC (DfT): What about contamination? Is that an issue?

161. MR SMART: That is a risk. I think Mr Hindle acknowledged that. That would be exposed in any geotechnical investigation but that would be at the surface and that has to be specifically dealt with. So if we did take it to Ardwick, we'd have to keep that in a separate stockpile etc, but there is a real risk, in all industrial cities, of contaminated land and there's bound to be some element of that. Whether that is in the water or not is a different kettle of fish.

162. MR MOULD KC (DfT): With those salutary points in mind, can we just turn please to Mr Hindle's programme, which is at A66(31)? Now, we went through some of this yesterday with Mr Hindle, so we won't duplicate points we made then, but I want to get your position on this.

163. We can see line 8, or stage 8, of Mr Hindle's indicative programme was the excavation of the main station box, do you see that?

164. MR SMART: Yes.

165. MR MOULD KC (DfT): And we can see that Mr Hindle has assumed that that stage is completed by the end of the second quarter of year 7 of his programme.

166. MR SMART: Yes.

167. MR MOULD KC (DfT): Line 10 is construction of all internal structures and fitting out of the station. Mr Hindle has allowed, I think, two and three quarter years for that stage to be completed. Do you see?

168. MR SMART: Yes.

169. MR MOULD KC (DfT): And he's assumed that that stage begins 18 months before completion of the construction of the station box, and he said that he'd assume, because the box is such a large structure, it would be possible to begin the internal structural works and the fitting out on a phased basis. Essentially you move from one end to the other, as I understood it, and so to some degree you can parallel work in relation to those matters.

170. First of all, can we just understand, please, in your experience, what is involved in internal structural work? What does the first part of stage 10 actually involve in practice?

171. MR SMART: I think first off, I need to make a key point about the fitout because this is sort of, I think, fundamental to any underground station and I'm going to have to refer to the tragic incident that occurred in November 1987, the Kings Cross fire where tragically 31 people lost their lives, including a senior London fire officer.

172. That led to the Fennell report and 157 recommendations, and ultimately that led to The Fire Precautions (Sub-surface Railway Stations) Regulations, which this House heard in July '89, which is when they were first passed, and they've now been updated in 2009. Since then, we've had the go-to guidance from the British Standards, which is BS9992, which is fire safety, design, management and use in rail infrastructure and buildings.

173. Now, what that does, is that makes a really significant issue, in a station this size, of fire life safety. Typically, you'd have to do the risk assessment but you've got to get people out within 15 minutes. That's where we were at St Pancras and St Pancras is a much simpler station, because it's pretty much on the surface and you've got elevated platforms. We've already heard from evidence of getting up from a deep station such as Westminster here and so you can imagine how difficult that is to ensure fire life safety.

174. What this does is it leads to what's known as compartmentation of the station. Compartmentation means that you have to divide the station into areas and fire seal them. That might be fire doors, firewalls, fire retardant materials and all service duct provisions need to be fire-sealed.

175. Then you have to put in a number of systems to deal with fire, typically, obviously, fire detection, but also fire suppression, which could be sprinklers or indeed mist; that creates its own problems with vision when you're getting out and even can cause scalds. So all this has to be looked at in some detail. Of course, you've got to have fire mains, hydrants, and that's got to go across the whole station.

176. Now, I'm only talking fire life safety and I can come onto all the other things you need to do to fit out a station and you can't be doing any of that where you've got any sort of wet trade happening because this is almost – well, it's even beyond builders' work actually and if you've got sensitive kit, as you do, having racks for things like the head end for CCTV, voice alarm, fire alarm, detection systems, intruder detection systems, you can't put sprinkler systems in there, so you may need gas suppression.

177. So all of this creates a massive burden to ensure just the fire life safety of the fitout of the station, not to mention all the other things you have to do, including putting in all the cabling and all the other supports, so I can go through that.

178. I think what Mr Hindle is showing here is primarily to do with the civil engineering part of the fitout of the station. So my evidence would be, yes, you can certainly start, as Mr Hindle has said, doing some of the structures, some of these slabs and the columns as you go but there's a limit to that because you've got to excavate materials as well. And if you've got columns and you're starting to put formwork in for the slabs, then you've got obstructions to how you can excavate.

179. I don't necessarily think you need to bring it up, but if you look at A66(10), Mr Hindle's slide, he shows the bottom-up construction and the top-down construction, and both of them are employed in the scheme for the box and it's sensible to do so. Top-down is generally a much slower excavation because you've got to form the slab and then you've got limited headroom to get plant in to do the excavation. So you speed up as you go down.

180. If you do the bottom-up method, which is faster, you have to excavate all of the material from inside the box and then you've got the big props across and you'll see those on Mr Hindle's slide, A66(10), and you've got to cast a base slab, and as you go up, you're casting slabs and taking out those props and you will need columns down the station, and all of that is happening while you're excavating.

181. So, although you can do that, the degree that you can get that fitout done while you're excavating is limited and you won't be able to achieve the level to open the station within the timeframe that Mr Hindle has suggested, although you might get a fair way through doing the civil engineering aspects of it, but there'd still be quite a lot to do. That's giving the benefit of the doubt because you've still got to bring – for the NPR sub-tunnels, they'd still be coming up through the box. Mr Hindle talked about creating some sort of space where you could do that without interfering with the station. You could do that, it's not straightforward, but you could do that.

182. The other thing about the slabs, because of part of the fire prevention and other things, those slabs have got to have cast in, if you like, ducts, I'll call them that, to put cables in and these could be quite sizeable. St Pancras, you can walk down it, you can walk through the slab; it's that deep that we've got the services in there because you've got to take power round the station. Again, St Pancras, we've got four substations coming in at 11kV, step down to 400; you've got to take all that round the station.

183. So once you've finished doing all of the civil engineering structures, which is the slabs and the columns, you've then to go in and do a lot of builders' work and the first part of that is you've got to put all your containment and all your racks and everything to pull the cables which power all the systems that you're putting in. Putting in block work, finishing floors, got to get platforms in. Then you gradually build up the MEP systems.

184. So typically you've got to have – obviously smoke extract is particularly important to ensure fire life safety, so that is one of the big things that the ducts would be cast into the slabs because that's where you get the resistance to fire. I've mentioned the power supply, the fire main, firefighting; you've got plumbing, hot water systems for the back offices. You've got escalators; we talked about them, 54 in the case of that box station, all the comms systems that have to go in.

185. Comms systems are particularly interesting, because the way of achieving that at the moment is to pull dark fibre around the station and then you need Edge switches, Cisco Edge switches, where users of the station can feed into to create their digital connections for internet, offices, etc. So all of that has to be done in a really dry, sterile environment.

186. Then you've got all the rail systems to put in for the control of the trains and the interface to the head end. Particularly important is the station operations room because that's the head end for all the systems that are coming in, CCTV, PA, VA, what the escalators are doing, what the lifts are doing, that all needs to come to a head end with a number of screens that the station controllers can then see. But all of that can't be done in any kind of wet environment and I haven't even covered all the systems. I could go on, but I'm sure the Committee have got enough of what I've said about that.

187. So basically, you're not going to achieve that with the overlap that Mr Hindle has shown, although you can of course get some way towards finishing the civil engineering structure. But even that is quite demanding when you're taking out formwork from these not straightforward slabs and then trying to excavate at the same time.

188. MR MOULD KC (DfT): So you've given us a flavour of what's involved and you made the point that a good amount of that work, as I understand it, you can't plan for that to start until after you have completed the main construction.

189. MR SMART: You could do what I would call the builders' work. You could start some of that, of course, but even that would be limited because you've still got excavation and wet trades with the major structure going on, but the degree of overlap shown is just not going to result in a fitout at the end of about 15 months. It's just not possible.

190. MR MOULD KC (DfT): What, in your view, in the light of those various points you've made – and as you've indicated, that's a flavour of all the work that's required at stage 10 and you've given an idea of the sequence in which it needs to take place – what's your view of a realistic planning programme to insert in stage 10 in comparison to Mr Hindle?

191. MR SMART: Once you've excavated out all of the earth from the box, two years

to complete what I call the civil engineering structure, the major pours, etc, overlapped with some builders' work, and then another two years for all the MEP systems. So basically, I'm adding about four years. So Mr Hindle I think has – so I'm adding two and three quarter years, I think, to where Mr Hindle is.

192. MR MOULD KC (DfT): Right.

193. MR SMART: Another year, if you add commissioning, which you'd have to do for the rail systems.

194. MR MOULD KC (DfT): That's what I refer to as trial.

195. MR SMART: Trial, yeah.

196. MR MOULD KC (DfT): Yes. 2.7 years onto stage 10 and then one year, essentially, on stage 13; is that right?

197. MR SMART: Yes.

198. CHAIR: I think I asked you yesterday, Mr Mould, your contention of the total Bill period of the delay would be, I think, 4.5 to 8.5.

199. MR MOULD KC (DfT): Yes.

200. CHAIR: And this is obviously the 2.75 in the year. That gets you to the lower end of 4.5.

201. MR MOULD KC (DfT): Yes, you need to bear in mind that, as Mr Hindle fairly acknowledged, his year 1 is not actually year 1. He's not built into his staging but has accepted in the note, there would be things happening before his stage 1, that is to say the time taken to achieve Royal Assent for the Bill, with the amended station proposals for Manchester, and then all of those – land investigation, design, land acquisition, utilities and other enabling works that are mentioned there. So once you build that in at the beginning, and then you make the additional allowances that Mr Smart has mentioned to you, then you get to the overall shape of the programme and we can show you the overall shape of the programme as we see it by turning to P418(33). The Bill scheme programme is at the top of this slide, Mr Smart. But just to see what we've – I think this is your estimate of the programme for going underground – if we can perhaps

blow up the lower half of this slide, just a little.

202. MR SMART: So in the green, which is civil station construction, primary structure, we have tiers within that for the fitout which is the combination of the completion of the civil engineering core structure and some limited other fitout and then we have the next yellow box, which is station MEP fitout and you can see that extends for two years after we've completed the core box. And then we've got the rail systems fitout and construction and, ultimately, testing, commissioning and trial ops, which take us out to the end of 2040 on that particular slide.

203. MR MOULD KC (DfT): Now, if you were to put this programme and Mr Hindle's programme side by side, they don't follow exactly the same approach.

204. MR SMART: No.

205. MR MOULD KC (DfT): You don't have the same stages that Mr Hindle has. To some degree, those have been brought into single bars on your programme.

206. MR SMART: Yes.

207. MR MOULD KC (DfT): But if I'm right, this represents your overall judgment of a prudent allowance for delivery into service of a four-platform underground station from now until delivery into service.

208. MR SMART: It does, but, if I was the construction director in charge of this, I would be concerned about that time. It's achievable, but I think there are risks, which is why we have our contingency provision of two years on top of that. So that's still, to my mind, at the challenging end of the range, although it allows a reasonable time to complete those.

209. MR MOULD KC (DfT): And that contingency allowance is the dashed line at the bottom of the page, is it?

210. MR SMART: It is and I would cite some of the recent problems we've seen with Crossrail stations. Commissioning some of these very sophisticated systems is not necessarily straightforward and therefore you need to be quite prudent in allowing some contingency on this type of work.

211. CHAIR: It's the contingency that gets us to eight and a half years, is it, for the delay?

212. MR SMART: Yes.

213. CHAIR: Okay.

214. MR MOULD KC (DfT): So if one was to, as it were, apply a greater degree of confidence in the programme to the blue diamond as it were, then the additional – the minimum addition that we say, with everything going to plan, represented by the four-platform underground station, would be a minimum addition of 4.5 years. Yes, that's right, on to the projected coming into service of the Bill scheme, the surface station.

215. CHAIR: So I'm clear on the timings here, as a minimum, that's one and a half years more than the Manchester partners. So on a best-case scenario, HS2's contention is, it adds a year and a half.

216. MR MOULD KC (DfT): But you need to be careful in placing too much reliance on that, is our case, yes.

217. CHAIR: It's your figures.

218. MR MOULD KC (DfT): No, but we've allowed a range.

219. CHAIR: You have got a very big range. That's why I'm interested in the credibility of that range.

220. MR MOULD KC (DfT): Well –

221. CHAIR: A four-year range is very significant so, I mean, if you present to a Committee a very big range and then say, 'Oh look, it could be eight and a half years', that's obviously quite frightening. The question is whether or not that is credible, because we're a minimum of one and a half years from where the Manchester partners are, up to very many years, and I want to know the credibility of the eight and a half years.

222. MR MOULD KC (DfT): If you like, the common baseline is an additional three years.

223. CHAIR: Yes.

224. MR MOULD KC (DfT): That's the Manchester partners' position. We say a minimum of an additional 18 months on top of that and then there is the issue of an allowance for contingency and risk, which was where your point comes in, yes. I mean, Mr Smart, are you able to give the Committee – shed any more light on to why you say that four years is a credible allowance for risk and contingency?

225. MR SMART: So that's primarily built from two components, which is two years' contingency on Royal Assent, because clearly we would have to go, if the Committee were to decide that an underground station was the solution, we'd completely have to re-work the environmental statement. That is not straightforward. That involves quite a lot of optioneering to ensure we've got the right station. It would involve design development and looking at the various options of the preferred solution, then of course preparing the environmental statement, all the traffic and transport assessments, which lead into dust, construction, and all the things that the Committee have heard about in petitions. So that is going to take some time. So that's two years. And then the other two years is, as you've heard, the construction contingency because of the complexity of an underground station.

226. MR MOULD KC (DfT): And is that a comparative point? In other words, are you saying construction complexity in comparison to the surface station?

227. MR SMART: Yes, yes.

228. MR MOULD KC (DfT): Everybody seeing this slide will have seen that there is no contingency range for the Bill station on this programme.

229. MR SMART: No.

230. MR MOULD KC (DfT): We can see that the blue diamond is the date given for delivery into service, in relation to the Bill station.

231. MR SMART: Yes, but there is contingency on that.

232. MR MOULD KC (DfT): And that's explained, is it, by the fact that the case for doubt in relation to achieving Royal Assent on the Bill scheme is low and the

comparative risk of difficulties in terms of delivering the surface station in comparison to the underground station, the engineering challenge that you've just mentioned, is much less.

233. MR SMART: That's right. And of course, the date of entry to service effectively, for the Bill scheme, is not just driven by a station. I mean, the station's a key component but, of course, there's a lot more that has to lead up to that to operate the railway but we're just talking about here the station date. There is contingency on that, yes.

234. MR MOULD KC (DfT): Alright. And so is there anything more you want to say about the issue of a realistic allowance for programme?

235. MR SMART: No, I think we've brought out the necessary points. I mean, I can't emphasise enough the complexity of dealing with an underground station with the passenger flows we've got. It is an issue that's live; we're dealing with it at Old Oak now. The Committee may actually visit Old Oak and it's a lot shallower. Old Oak is somewhere around about 17 rather than over 20 metres, virtually 29 metres' depth we've got here and that all takes time to install and commission. So you've got to be realistic and make the right assumptions at this stage.

236. CHAIR: Grahame, before Mr Mould moves on. Grahame?

237. MR MORRIS: Yes, thanks. I wonder if I might just ask Mr Smart, your CV is very impressive in terms of the civil engineering projects. I can remember the construction of the Westminster Station. I mean it's still incredibly impressive. It's like a cathedral, very dystopian, the architecture. But that must have been a colossal engineering challenge to build that and, similarly, St Pancras and Canary Wharf and so on. But with your skill and the will to press ahead with those projects, whether the justification was economic or to improve and support infrastructure generally, these challenges have all been overcome.

238. And I was just thinking, I remember earlier you were saying you did your training with British Coal in my region when you were a young engineer and I can remember tales of the colliery in my village, Merton Colliery, which was sunk in 1834 and the massive engineering challenge similarly with the shafts flooding. And they brought

German engineers, sinkers they were called, to freeze the strata and then that was before they had concrete roof lining prefabricated panels. You had to brick them up to get past the – but they did it and these challenges can all be overcome and that pit continued for 151 years.

239. MR SMART: No, I agree, and I think our evidence is that we're not saying, 'You can't do this'.

240. MR MORRIS: It's the cost involved.

241. MR SMART: It's a question of what's a realistic schedule and the schedule plays into cost, of course. So my evidence is not that you can't do it. My evidence is really simply that one needs to be realistic about the challenges that are involved, compared to the Bill scheme.

242. MR MORRIS: And were the challenges that were put at that time in relation to Westminster station or the Jubilee line, Canary Wharf or Stratford, were the challenges that were put by the funders different to those that are being put now? I mean, have we got one rule for the north and one rule for London?

243. MR SMART: No, no. I should have perhaps clarified. If you look at the Stratford station, for example, Stratford box, the actual station is pretty much on a bridge over the box so there's a limited amount of fitout of the box. There're escalators and there's lighting and there's power. But I think what you're articulating is, when you are building a Metro, pretty much as the Jubilee line extension was, a two-track railway underground, the challenges of that are less than a massive underground station that's a high-speed rail station, and I would go as far as to say, regional station, and if you look at what the Victorians did, all of the stations around the edge of London, you come in pretty much on the surface, although Euston, of course, you come in a very deep cutting. And there's a reason for that, because of the cost of going underground and the difficulties of going underground. And you can do it – you're right, Mr Morris – but it does come at a cost and it does come at a time impediment as well.

244. MR MORRIS: In terms of size and scale, how does the box under Old Oak Common, at the very start of HS2, in terms of size and scale and depth, compare with the proposal for the underground through station at Manchester? I know the committee

might be going to look at that one and give us an indication.

245. MR SMART: That is a lot shallower. The maximum depth of excavation is 17 metres and the length is less if you look at the caverns because we've got a small cavern then another box. So it is a much smaller station.

246. MR MORRIS: Half the size or –

247. MR SMART: No, it would be more than half the size because the platforms have to accommodate a 400-metre train. So the length of the actual box and the concourse area would be about the same.

248. MR MORRIS: It might be useful exercise to see it then, Chair.

249. CHAIR: I would agree. We're heading there. Mr Mould, sorry.

250. MR MOULD KC (DfT): Just help remind us, just in the light of Mr Morris' questions, remind us of this point. Take the Elizabeth line station at Paddington, yes?

251. MR SMART: Yes.

252. MR MOULD KC (DfT): Can you help the Committee? How does the size of the station box that we're considering here for a four-platform underground station, how does that compare in size to the box which was excavated and fitted out for Paddington station?

253. MR SMART: Well, I can give you an excavation comparison... Precise length, I haven't got the intimate knowledge of Crossrail but in terms of looking at the excavation, we've got Woolwich would be about – this station would be about 19 times the excavation of Woolwich and 15 of Paddington. So it's an appreciably bigger enterprise and would be unprecedented in the UK, if not the world. There is an underground station in China. I don't quite know the details of the size of it, but it does have a lot of limitations because they shut the gates 12 minutes before any train can go and things like that, but this would be pretty unprecedented.

254. MR MOULD KC (DfT): So is your more cautious approach than Mr Hindle's, in terms of how long we should assume it would take to build, is that predicated on that kind of consideration?

255. MR SMART: Yes, I think my summation of – I think Mr Hindle's done some good work in looking at how you would build the box from a civil engineering perspective. I think where I would take a bit of issue is the amount of time he has allowed to actually bring us a station of this size that's an underground station, with all the complexity that that brings, into use.

256. MR MOULD KC (DfT): Thank you. We had a revised cost schedule yesterday. We might just bring that up again, just to remind ourselves, P424(3). I think, sir, the Committee understands very clearly that the primary point of difference is the capital cost of providing a turnback facility and we saw that reflected in the fourth line of this table. I don't know if we could just blow it up a little bit. And the Committee understands the issue there as to whether it's – there's an issue about whether that's actually a cost that would need to be incurred but there isn't, Mr Smart, I think on the evidence, an issue as to the appropriate allowance for costs in this sense. Although Mr Palmer questioned whether that figure was too high, there isn't any alternative figure in evidence before the Committee.

257. MR SMART: I would argue there is, which is, would you build a turnback or would you build a six-platform box?

258. MR MOULD KC (DfT): Yes, well, I understand why you put it that way but just on the simple question, have you seen an alternative cost put forward by the GM partners for a turnback facility?

259. MR SMART: I haven't, no.

260. CHAIR: £5.9 billion remains the contention of HS2, then.

261. MR MOULD KC (DfT): Yes. I only hesitate because I don't want to put only half a case to you. Can we just go right the way along to the right-hand side. You can see the range of costs. I thought it might be helpful just to remind you. Columns 3 and 4 from the left, the bottom line, are the range of costs that Dr Simmonds has based his analysis on, that is to say plus £1.734 billion to plus £2.627 billion. Our figures are plus £4.432 billion to plus £5.325 billion and, as you can see from the heading, in each case, each party has put in a range which represents a lower estimate to a higher estimate, as you can see from the headings. I hope that's clear. And we can see from looking across

those columns that, although there's this issue about car parking, the significant issue is whether you include provision for a turnback facility or not.

262. MR SMART: That's right.

263. MR MOULD KC (DfT): The Committee knows about the – once you get below the – you get the first grey line, which is in the middle of the page. That's the capital costs themselves before you apply indirects and contingency. But those uplifts are applied across the board, so there's no difference between those on the application of those uplifts. You just apply percentages to those headline costs in the middle of the page. That's Mr Smart's evidence, thank you.

264. CHAIR: Thank you. Before I go to Mr Cameron, just a question of Mr Smart then. So assuming timings and budget wasn't an issue – of course it is. I understand that – in your professional opinion for the running of not only HS2 but future NPR, what is better, an underground through station or an above ground terminating station with this turnback?

265. MR SMART: So you will hear evidence on the operation. So leaving that aside, sir, every time, a surface station for me. You may hear evidence later but of course I'm going to have St Pancras in my heart, aren't I, and indeed Beverley Craig, leader of Manchester City Council, referred to the development behind what is Kings Cross St Pancras as being, I think, exemplar. I think that has a number of viaducts that come in across there. From memory – I should know – about five or six plus a diverted York Way, and it's an exemplar, I think, development that was done with our partners, Argent St George and LCSP.

266. Also, from the point of view of passengers arriving in a city, to be in a deep box like this when you could be going out pretty much on admittedly a metro, but you'd have the vision of seeing the city and creating a gateway. I would, in my professional opinion, certainly have a surface station because, otherwise, you are in a very deep box and I don't think it's a great environment, and I do think you can make the urban realm around a station – it's not my expertise. I'm not a town planner or architect – but I do think you can make that an attractive proposition.

267. CHAIR: Thank you. Mr Cameron?

268. MR CAMERON KC: Thank you, sir. Good morning, Mr Smart.

269. MR SMART: Morning.

270. MR CAMERON KC: Everybody will be relieved that I'm not going to take up every issue with you and I gather from what you've said that rail issues are for the next witness, are they?

271. MR SMART: Operational rail issues.

272. MR CAMERON KC: Operational rail issues.

273. MR SMART: Engineering rail issues, not.

274. MR CAMERON KC: You began by referring to your extensive experience in engineering work with station boxes and I won't go through the list, but were any of them in Sherwood sandstone?

275. MR SMART: No.

276. MR CAMERON KC: And in terms of construction, it's agreed between us that there's no issue that the construction of an underground station, whether it's four-platform or six-platforms, is technically feasible. You can do it, can't you?

277. MR SMART: You can do it.

278. MR CAMERON KC: And therefore, when one turns to fire safety issues and the like, those are not problems which are insuperable. They can be overcome. Is that right?

279. MR SMART: Yes, and I believe that's what I was saying in my evidence but they can only be overcome with sufficient time and sufficient money.

280. MR CAMERON KC: So if it's technically feasible, the issue for the Committee becomes whether, as a matter of judgment, the station should be overground or underground and that judgment is based on factors other than whether it's technically feasible. Is that right?

281. MR SMART: I think that's a fair assumption, yes.

282. MR CAMERON KC: And the promoter's position on why a six-platform, as it was, underground through station should not be built, and the reasons for it, are set out in the integrated rail plan, are they not?

283. MR SMART: Yes.

284. MR CAMERON KC: And we have those if we just go to P431(3) and we've got paragraph 3.19 in the integrated rail plan. And point 1 was delay but that was based on a minimum of seven years and we're now at a minimum of 4.5 on your case. Is that right?

285. MR SMART: A minimum of, yes.

286. MR CAMERON KC: Yes, well, it's a like-for-like basis. That was a minimum seven and now a minimum of 4.5.

287. MR SMART: Well, it depends what you're trying to get me to – if you're looking at comparing the construction, my analysis was – it's difficult because Mr Hindle's putting in – where he is in time, but when you look at the contingency, we were on the figures that Mr Mould gave, but those were our components to that and I'm not quite clear on the relevance, Mr Cameron, to this point.

288. MR CAMERON KC: Right. Well, don't worry too much about relevance but the IRP sets out the reasons and reason 1 is opening benefits were delayed by a minimum of seven years and the figure is now minimum 4.5. That's agreed, is it? That's your figure, not an agreed figure. Is that right? Is the minimum four and a half years? That's what you've just told the Committee.

289. MR SMART: The minimum is four and a half years without contingency, yes.

290. MR CAMERON KC: Thank you. And can we go on to the next page in the IRP, please? We're not going to go through each of them but those are the formal reasons given by the Government for rejecting underground, are they not? And we can come back to them in a moment.

291. MR SMART: Given in the IRP, yes.

292. MR CAMERON KC: Well, you say, 'given in the IRP', but the IRP is the formal,

as Mr Mould is keen to point out, the formal statement of the Government's policy.

293. MR SMART: Yes.

294. MR CAMERON KC: Now, if factors had changed since the IRP was published and that decision was made, that could be a reason for taking a different view, could it not? And if the facts change, you have to review the position.

295. MR SMART: I would say yes, but if the IRP is Government policy, there has to be a view taken on that but on the face of it, yes.

296. MR CAMERON KC: Thank you. Now, I'm going to come on to delay and cost in a moment but as far as the station that is promoted by the promoter, that is designed to serve both HS2 and NPR, is it not?

297. MR SMART: It is.

298. MR CAMERON KC: And it's designed to serve three HS2 terminating services per hour. Correct?

299. MR SMART: Yes.

300. MR CAMERON KC: And for NPR, four NPR of six trains per hour.

301. MR SMART: Yes.

302. MR CAMERON KC: With the potential to increase to eight trains per hour.

303. MR SMART: Yes.

304. MR CAMERON KC: And that is described as future proofing.

305. MR SMART: Yes.

306. MR CAMERON KC: But it's not designed to go any further than that, is it?

307. MR SMART: I'm not an operator so I can't absolutely answer that question, but that fulfils the stated policy and future proofing in line with the Transport for the North expectations.

308. MR CAMERON KC: But, of course, the future policy, the IRP that we've just looked at, runs for a period to 2050.

309. MR SMART: Yes.

310. MR CAMERON KC: And even if Phase 2B were to open as planned, that would be in 2036.

311. MR SMART: Yes.

312. MR CAMERON KC: It would only have 14 years, it might be 13.5, depending on where it is in the year, but 14 years or so in service before the IRP ceases to be applicable, because it only runs to 2050. Is that right?

313. MR SMART: Yes.

314. MR CAMERON KC: And if one is to expend the amount of money which is being spent on this station on Phase 2B, do you agree that it's wise to look further ahead than 14 years after the station opens?

315. MR SMART: No, I don't.

316. MR CAMERON KC: You don't.

317. MR SMART: Because you have to have some key assumptions as to what will be required and we don't know yet what NPR is going to look like but we do know the assumptions that Transport for the North have made and, furthermore, this is an HS2 station.

318. MR CAMERON KC: It's an HS2 station plus NPR because if it was HS2 only, it was originally proposed as a four-platform station, wasn't it?

319. MR SMART: It's an HS2 station that now enables NPR to be executed in accordance with the specification for train service that we designed it to plus enables future proofing for the Transport for the North expectations. That's the bottom line.

320. MR CAMERON KC: To answer my question, if it was HS2 only, it would be four platforms. That's what was proposed originally, wasn't it?

321. MR SMART: Yes, but we've enabled NPR.

322. MR CAMERON KC: And that's why you've got six platforms.

323. MR SMART: Yes.

324. MR CAMERON KC: But just on that point, it's your view, and the view of the promoter, that it's not wise to plan beyond NPR core at six trains an hour and NPR future proofing at eight trains per hour. You haven't sought to do so and you don't think it's wise to do so.

325. MR SMART: Correct.

326. MR CAMERON KC: Now, if we can turn to the cost issues, and then we'll come on to delay. If we can have up P424(3), which is the updated cost schedule, please. We were looking at it just now but the difference, the main difference between us, is on the cost of the turnback sidings.

327. MR SMART: Agreed.

328. MR CAMERON KC: And just so that we can get the maths right in our head, although the figure there appears, £1.278 billion, if you add on the L&P costs, the indirect costs and the contingency, the figure that appears in the bottom line is roughly double that, isn't it? It's £2.5 billion.

329. MR SMART: Yes.

330. MR CAMERON KC: So if one is going across the bottom line and comparing, if you didn't have the turnback sidings, you'd take off £2.5 billion, not £1.2 billion, if you're going along the bottom line.

331. MR SMART: Yes.

332. MR CAMERON KC: Now, at what stage – you're planning a surface station that has three terminating HS2 and up to eight NPR services – we've just been through that – at what stage with the underground through station would you need the additional turnback facility?

333. MR SMART: When the NPR services come on line.

334. MR CAMERON KC: Well, can we just go back then to Mr Lax's exhibits? And we need to go to the one which has got scenario 3 on. Let me just get that in front of me. Sorry, apologies for the delay.

335. CHAIR: No worries. We're happy to accommodate.

336. MR CAMERON KC: Right. A64(54), please. So if we've got A64(65), scenario 3, and we have London services terminate and we have eight NPR, now if the London services are terminating, why do you need a turnback at that stage or is that a question for the rail operations person?

337. MR SMART: It's a question for the rail operations person but I think we've already heard some evidence around the problems with trains that are broken down or failed etc but it is a question for the operator.

338. MR CAMERON KC: So the main point at issue between us on cost turns on whether you do, in fact, need a turnback facility associated with the underground through station. That's agreed between us.

339. MR SMART: That's the principle, yes.

340. MR CAMERON KC: And –

341. MR SMART: Can I just say, there are other costs that accrue with an underground station? There's additional tunnelling and shafts. I understand they are included within the GM partners' costs. I haven't seen evidence for that but, that being the case, then it would be the turnback sidings.

342. MR CAMERON KC: And then if we go back to P424(3), there's an item there, which is not included in most of the entries for overground empty coaching stock. Now what type of facility is that? Is that a turnback?

343. MR SMART: Empty coaching stock is where you would – well, it's a question for the operator but it's basically a stabling facility for moves, which the locomotives or the trainsets need to make when they're not in service.

344. MR CAMERON KC: Yes.

345. MR SMART: So you need to move them around to get to maintenance depots etc.

346. MR CAMERON KC: They go into an empty coaching stock facility and they can come back out again.

347. MR SMART: Yes.

348. MR CAMERON KC: So it provides that turnback facility, does it not? They have to be able to get in and go out again.

349. MR SMART: If you can get to it from an underground station.

350. MR CAMERON KC: If you can get to it. But in terms of cost, £56 million, is that for a surface facility?

351. MR SMART: It is.

352. MR CAMERON KC: So if the Committee wish to know the approximate costs, that's for a different purpose, of a turnback facility on the surface, they have the £56 million figure in front of them, don't they?

353. MR SMART: It would depend where those turnback facilities were because there's land and property costs etc.

354. MR CAMERON KC: Of course.

355. MR SMART: And it would depend on the distance because if there's more track and infrastructure to those turnback facilities. So I would say no more than you could take it is a guide. But I think if your point is that it would be less than an underground, of course.

356. MR CAMERON KC: But it's not only less but very substantially less.

357. MR SMART: That does depend on the facility and where it is and my evidence would be, if you've got an underground station at Manchester Piccadilly, how would you get to such a facility? Because if you look at the track alignment and the distance, there's nowhere where you could really do it.

358. MR CAMERON KC: I know that but, of course, we're only contemplating the

need for such a facility, if one does need one, when NPR is operating. So the NPR lines are going beyond Manchester.

359. MR MOULD KC (DfT): That's not our case.

360. MR SMART: That's not our case, no.

361. MR CAMERON KC: Well, are you suggesting – well, let's just test this out, if that's not the case. If one takes HS2 terminators only, before NPR comes into service, are you saying you need a turnback facility at that stage?

362. MR SMART: Well, this is a question for the operator.

363. MR CAMERON KC: Well, do you know the answer?

364. MR SMART: Can you repeat the question?

365. MR CAMERON KC: Yes. Are you saying, when you have HS2 only, so you've got three terminators an hour, you need a turnback facility in conjunction with an underground station?

366. MR SMART: Not a turnback, necessarily. You'd need to check that with the operator but we do need two coaching stock sidings.

367. MR CAMERON KC: But you need those for your own operation, don't you?

368. MR SMART: Yes, yes.

369. MR CAMERON KC: I mean, you can't possibly be saying, can you, that you need a turnback facility with a four-platform underground station for HS2 only, because you were originally proposing a four-platform surface station?

370. MR SMART: And, I'm not saying that, yes.

371. MR CAMERON KC: So you only start to need it when you've got NPR.

372. MR SMART: Yes.

373. MR CAMERON KC: And the purpose of NPR is not just to run to Manchester and stop, is it?

374. MR SMART: Well, to clarify, you only need that when NPR goes beyond the level of service provision that we've provided for, which does include the Transport for the North aspirations for future proofing.

375. MR CAMERON KC: You say you only need the turnback facility with an underground station when you go beyond the 11.

376. MR SMART: Well, the station operates –

377. MR CAMERON KC: Can you just answer that please?

378. MR SMART: The station operates up to a level, which you need to check with our operational witness. But we can operate to a level but we do need turnbacks beyond that.

379. MR CAMERON KC: Operate to what level?

380. MR SMART: The eight train paths per hour, is my understanding.

381. MR CAMERON KC: Right. So your understanding is, you can operate to eight trains per hour, eight train paths per hour on NPR, before you need a turnback.

382. MR SMART: No, I'm not going to give an opinion on that because I'm not an operator.

383. MR CAMERON KC: Well, let's move on from that point and let's go to the delay point, if we can. Now, on delay, as the Chairman identified, on the minimum delay, and I know you've got a range, there's one and a half years between us.

384. MR SMART: Yes, I think we need to just be clear about what point that is. One and a half years until when? To what point? Because there's another year, of course, for trial operations. Are you including that?

385. MR CAMERON KC: Your four and a half years, does that include the trial operations?

386. MR SMART: I'm looking at an additional two years for the fitout of the main box, two years for what I call the station building works and MEP work and all the issues that I've gone through in my evidence. So that's four years. Then Mr Hindle, I

think, allows 15 months. So you take that off and then you've got to add the year for testing and commissioning and you've got to allow testing and commissioning and trial ops, which is about another year if they overlap, isn't it?

387. MR CAMERON KC: Let's have a look at the elements, P418(33), please. Slide P418(33).

388. MR SMART: Yes.

389. MR CAMERON KC: Which I think you may have in front of you.

390. MR SMART: I do.

391. MR CAMERON KC: Now, the differences, if you look at the differences between us and concentrate on them, there are two elements to it. There's the parliamentary process, which are the yellow bars towards the top of each chart, and then there is the construction process, put generally.

392. MR SMART: Yes, that's correct.

393. MR CAMERON KC: Those are the two elements. And if we look at – let's go to parliamentary process first. You've assumed for the Hybrid Bill passage, and the Committee are probably getting anxious at this stage, but 2024, although it has to go to another House. And you're assuming that that is complete in 2024 with Royal Assent.

394. MR SMART: Well, we do have a general election but that's what this programme assumes, yes.

395. MR CAMERON KC: And that's what this programme assumes. Has that been altered at all?

396. MR SMART: Not in this programme, no. But depending on what may happen with APs then that, of course, could change. Additional provisions.

397. MR CAMERON KC: If there are additional provisions, that would push the process out beyond the end of 2024, would it?

398. MR SMART: It would.

399. MR CAMERON KC: And is there any estimate as to where it would be pushed out to?

400. MR SMART: It could be a year.

401. MR CAMERON KC: A year? So if we're making a comparison between the two, we have to take that year into account in the baseline, don't we? It could be, not definitely will be. I appreciate that.

402. MR SMART: I would suggest not because an AP that we might contemplate would not be as significant as an AP for an underground station. So I think that it would be additive.

403. MR CAMERON KC: I'm not suggesting that the AP that you're contemplating would be the same as for an underground station but I'm looking at the baseline. What you're doing is comparing the Hybrid Bill proposal with an underground through station, but if you've added a year on to the Hybrid Bill proposal, that alters the baseline, doesn't it?

404. MR SMART: Yes, but if that happened, it would also apply to the comparison with the underground station.

405. MR CAMERON KC: Well, let's have a look at whether that's the case because you can do two things at once. You can promote those other APs and you can promote an additional provision for an underground station, can't you? One does not have to follow after the other. They can both be done at the same time.

406. MR SMART: It depends on what is covered in those APs because they could impinge on each other, especially from traffic and transport, but I do agree that there is some form of overlap. But I think when you look at the implications of an underground station, that is a very sizeable AP and therefore the amount which you can overlap is going to be, I think, not so significant.

407. MR CAMERON KC: So, I mean, if you've got an additional year on the Bill, that would, in effect, take a year or if you could promote the AP for an underground at the same time, that would take a year off the difference.

408. MR SMART: If you could do that and I don't think it would be possible.

409. MR CAMERON KC: Well, let's have a look. In terms of –

410. MR SMART: Because the AP for the underground station would be so significant that that, in itself, would be in the order of something like two years to get everything done.

411. MR CAMERON KC: But you can get everything done whilst you're also dealing with the other APs, additional provisions, whatever they're dealing with, airport station or whatever it is.

412. MR SMART: There's an overlap but I don't necessarily think it means that you take the year off the AP for the station.

413. MR CAMERON KC: I'm not suggesting you take a year off the AP for the station. What I'm suggesting is that the baseline moves because the Bill would have passed in 2025 so instead of being a two-year delay, it's a one-year delay. It still takes two years for the AP for the underground but the addition to the process is one year, not two. Do you agree?

414. MR SMART: I agree.

415. MR CAMERON KC: Thank you. And on the construction timings, now if we can go to P425(5)? Promoter volume 3, page 60. And can we go up to 1.2.4? I mean, one of the reasons that you say there will be more delay than the GM partners suggest is because of an overly optimistic view of ground conditions. The rock is a better quality than the evidence suggests. I mean, is there any dispute with Mr Hindle that Sherwood sandstone has loadbearing capacity, which means that cavern construction is easier as a result?

416. MR SMART: Well, Sherwood sandstone, if it has got the properties that Mr Hindle says it has, it clearly would. But you can build the cavern, as Mr Hindle, I think, illustrated in his evidence, pretty much whatever the ground conditions, provided you take the right precautions, which might happen to include dewatering and dealing with the water. So I think it's a bit of a moot point as to whether you can construct a cavern because, yes, you can. I'm not taking any issue with that.

417. MR CAMERON KC: No.

418. MR SMART: But how easily that cavern turns out to be would depend on the state of the Sherwood sandstone and, as you've heard, there's evidence from other projects in the region where the Sherwood sandstone hasn't turned out to be as straightforward as perhaps envisaged by Mr Hindle. So you would have to take a view that you can deal with the cavern. You can do it but I come back to the same point. It's a cost and schedule in dealing with it but I'm disputing that you can't do it.

419. MR CAMERON KC: No, but on scheduling, when you've approached scheduling, you haven't made any allowance for the fact that Sherwood sandstone can be self-supporting and therefore can make underground construction easier rather than harder. There's no allowance for that, is there, in your programme?

420. MR SMART: Well, the point is, if the rock is a lot better, which it could be, then it's harder to excavate. So it's as broad as it's long because you'll take longer to excavate if you've got good-quality rock.

421. MR CAMERON KC: That depends on the equipment you use, doesn't it?

422. MR SMART: Well, it does, but there's still a limit to that. So if the rock quality is better, good, but its excavation is harder. If the rock quality – it's not so much the rock, it's the water, as I gave in my evidence. If you encounter the water, you've got to deal with it and that comes at additional cost of dealing with regional pumping; potentially you have underdrainage issues or settlement issues. But I don't think there's a great deal of difference between the evidence of Mr Hindle and myself in terms of these things can be dealt with. It's a question of how you deal with them in your engineering and that comes to cost and schedule.

423. MR CAMERON KC: Old Oak Common, you were asked about. How many – and you made a comparison between depth, length and so on – what's the size of the station there? How many platforms are there?

424. MR SMART: I'd need to check. Four, I think. I'd need to – but there's the crossovers and we've got a – the Victoria Road box. So four, I think. But we've got a connection at Old Oak with the Great Western Main Line so I would need to double-

check on that.

425. MR CAMERON KC: Would it be right that the station has, because it's dealing with other lines as well, 14 platforms in total and six high-speed platforms underground.

426. MR SMART: Yes.

427. MR CAMERON KC: Is that right?

428. MR SMART: Yes, it is six.

429. MR CAMERON KC: So if you're comparing with Old Oak Common, in terms of excavation, time and delay – it depends of course on ground conditions; it depends on all these factors – but as a starting point, for the high speed only, six platforms, you've got more to do than you have with four.

430. MR SMART: We do, but there's a question of the depth of the box and how you – that's just the platforms. The box itself is not as deep. So in terms of the construction, you've still got some major issues to deal with and all the fitout, as I've said, but the excavation is much less.

431. MR CAMERON KC: Moving from that element of delay, delay releasing plots for development, is that a question for you or for Mr Eckett?

432. MR SMART: Well, it depends what you're going to –

433. MR CAMERON KC: It depends what the question is, yes.

434. MR SMART: Yes. But I think it's probably Mr Eckett but you can try me, Mr Cameron.

435. MR CAMERON KC: Just as a matter of principle, if there are no viaducts planned for NPR on the surface, let's row back one. On the Hybrid Bill proposal, you put in the ability to construct viaducts as part of an NPR proposal in the future but you don't build those viaducts, do you?

436. MR SMART: That's correct.

437. MR CAMERON KC: And so, anybody contemplating development, if there was

a surface station, would know that there's a future ambition to have an NPR service served by viaducts on the surface, which go out from Manchester Piccadilly.

438. MR SMART: Yes. But how extensive those viaducts would be would be a question of the design of the NPR because you could go into tunnel fairly quickly from our viaduct, probably within a kilometre. So depending on what the Hybrid Bill might be, or enabling legislation, I should say, for the NPR, would determine whether those viaducts are significant or not.

439. MR CAMERON KC: That, I mean the very point you've just made, if you don't know, and you're a developer, that is likely to deter – this may be outside your scope of expertise – deter development in that area if you know there are going to be or may be a viaduct on the surface. You don't know how long it's going to be. You don't know where it's going to go into tunnel, whereas if it was underground, you wouldn't have that deterrent, would you?

440. MR SMART: Well, you'd still have some deterrent because you have a safeguarding zone around tunnels. But how much of an impediment it would be to a developer, I don't know. I would imagine that you would plan for infrastructure in that corridor.

441. MR CAMERON KC: And you'd plan, knowing that there was going to be a viaduct, whereas if it was underground, you'd know that there wasn't going to be.

442. MR SMART: That's the logical conclusion but I'm not a developer.

443. MR CAMERON KC: And in terms of disruption in central Manchester, if you build underground, you have all the disruption when you build that underground four-platform through station. That's when the disruption on the surface takes place, isn't it?

444. MR SMART: Yes.

445. MR CAMERON KC: Whereas if you come along later with NPR to build viaducts, there are two main elements of disruption because you have disruption when you build the six-platform surface station and the viaduct that goes to your tunnel portal and then, when NPR comes along, you have another whole series of disruption.

446. MR SMART: Well, that's a matter for the NPR enabling legislation and I can't comment on that.

447. MR CAMERON KC: Well, you can't comment on it but, as a matter of principle, is it better to have one episode, if I can put it, of disruption or two?

448. MR SMART: Well, I think it does depend because is it better to have one shorter and another following or one longer? I mean, it depends how you phase the works, I would suggest. So it's difficult to say what's better. It all comes down to phasing the works and that's how railways are built, in staged works.

449. MR CAMERON KC: Thank you, Mr Smart. Those are all the questions I've got for you.

450. CHAIR: Thank you, Mr Cameron. Mr Mould, did you have anything further?

451. MR MOULD KC (DfT): A couple of questions. If we go back to P431(3). This was the page from the integrated rail plan that Mr Cameron asked you about.

452. MR SMART: Yes.

453. MR MOULD KC (DfT): And Mr Cameron pointed out that in the integrated rail plan published in late 2019, the reasons given for preferring a surface station to an underground station included the bullet on this page, which was that the delivery of an underground station would be likely to delay the coming into service and the realisation of the benefits of the western leg by a minimum of seven years, compared to the current proposals. Just help the Committee. At that stage, was the Government making a comparison between a surface station and a four-platform underground station?

454. MR SMART: From memory, yes.

455. MR MOULD KC (DfT): It was? Alright. Do you mind if I correct him on that?

456. MR CAMERON KC: Yes, you can correct that.

457. MR MOULD KC (DfT): In fact, that's the wrong answer. Mr Smart's memory is playing tricks with him. That was when we were comparing it to a six-platform underground station. And you'll see – Mr Cameron's very kind – you'll see that if you

look in the SIFT report, which of course was published later but it reflected work which was underway in 2019, the seven-year delay is the estimated delay that would result from constructing a six-platform underground station.

458. MR CAMERON KC: There's no dispute about that.

459. MR MOULD KC (DfT): That's very kind.

460. MR CAMERON KC: Perhaps Mr Mould can give the evidence.

461. MR MOULD KC (DfT): I have done this with your leave anyway.

462. CHAIR: Now, now, now, let's play nicely.

463. MR MOULD KC (DfT): Leading counsel, eh?

464. CHAIR: No. Okay. Right, I think we've got that point.

465. MR MOULD KC (DfT): That's that point. Mr Smart, just one more point, if I may.

466. MR MORRIS: Just while I've got that in my mind, it was seven years' delay when the comparison was with the six-platform underground station, so is it generally agreed that now we're making the comparison with the four-platform underground station, it's four and a half years? Have I got that wrong?

467. MR MOULD KC (DfT): Well, again, I'm loath to give – I understood Mr Smart's evidence to be that the minimum additional period that would be required to construct a four-platform underground station would be four and a half years, but that he had made an allowance for contingency which extended that period up to eight and a half years. That was what I understood to be his evidence, and Mr Cameron obviously asked him about that and you have a note of his questions and the answers.

468. CHAIR: Thank you.

469. MR MOULD KC (DfT): Mr Smart, I just wanted to come back to the question of – can you put up P424(3) and the turnback facility? Mr Cameron drew your attention to the costs shown in the schedule for empty coaching stock sidings at £56 million and drew the contrast between that and the costs shown for the underground turnback siding

of £1,278 million. Just remind us, can you help the Committee? What are the key components of that cost for the underground turnback siding? What assumptions have been made in order to build up that cost?

470. MR SMART: Well, you've got to have the turnbacks from an operational point of view. You've got to have a turnback siding at about two and a half minutes' travel time, it's an operational point, from the station and that would have to be an underground facility in a cavern, so it's a higher cost of forming the cavern for the turnbacks – obviously got to be something in the order of – got to be more than a 400-metre train.

471. Grade separated junctions so that you've got the connection between, if you like, the main line going out to the north eventually, and all the rail systems and vent shaft for fire life safety that would be required. So it's not just really – and the rail systems that have to go in and the track and the signalling, etc. It's quite a substantial undertaking.

472. MR MOULD KC (DfT): So far as the assumptions made about costs for the empty coaching stock sidings, does the Bill scheme make an assumption as to where they would be located?

473. MR SMART: Yes, they do, yeah.

474. MR MOULD KC (DfT): Where is it?

475. MR SMART: It's quite down to the – can we just put up – have we got an exhibit that shows –

476. CHAIR: If it's helpful, Mr Mould, one or two of us might need a comfort break, so I will actually just suspend the Committee for three minutes while we just take a quick a quick comfort break and give you time to find that.

477. MR MOULD KC (DfT): Thank you.

478. *Sitting suspended*

479. *On resuming –*

480. CHAIR: The Committee is back in session. I will add five minutes on for that comfort break, just so we're all getting our allocated time. So Mr Mould.

481. MR MOULD KC (DfT): Mr Smart, we found the diagram; for the record, it's P421(260).

482. MR SMART: It's not as helpful for the Committee as I'd hoped, but anyway, it does show it, yeah.

483. MR MOULD KC (DfT): Top of the page, isn't it?

484. MR SMART: Yes.

485. MR MOULD KC (DfT): I don't know if we can blow that...

486. MR SMART: Yeah, that's it. It's in Ashbury[?], so it's only on the schematic. I thought we might have something that showed it, but that's the facility. I think we put the cursor on it and we can see it there.

487. MR MOULD KC (DfT): Yes, if we can just go down to the right-hand side.

488. MR SMART: The pink boxes, over the page.

489. MR MOULD KC (DfT): So it's just beyond the Bill limits for the current Bill.

490. MR SMART: Yes.

491. MR MOULD KC (DfT): And we can see where the Bill limits are with that dashed line across the spur out on the Leeds leg of the NPR. Yeah?

492. MR SMART: Correct.

493. MR MOULD KC (DfT): That would be a surface facility.

494. MR SMART: It would be.

495. MR MOULD KC (DfT): Yeah. Okay. Thank you very much indeed, Mr Smart.

496. CHAIR: Thank you. Any questions, members? No? Thank you, Mr Smart. Mr Mould, your next witness.

497. MR MOULD KC (DfT): Thank you. I'll call Mr King, please. Mr King is obviously new to the Committee.

498. CHAIR: He is.

499. MR KING: Morning.

Evidence of Mr King

500. MR MOULD KC (DfT): Mr King, I'll just introduce you. You're a chartered fellow of the Institute of Logistics and Transport, a fellow of the Institution of Railway Operators, 43 years' experience in railway business planning, change in operations in the private and public sector covering all types of railway operations. You are currently with WSP UK.

501. You've been providing professional service to HS2 for the last 10 years, working with both HS2 and the DfT in relation to high-speed rail and the integration of the high-speed railway with Northern Powerhouse Rail and other railways. I also draw attention to the fact that prior to your 23 years in international technical consultancy work, you held senior operational positions at West Anglia Great Northern and later Anglia Railways. You were head of operations and customer service, operational safety, accountable to the boards of these organisations for the strategic development and delivery of service operations and customer safety.

502. So you have practical experience of operating railway lines as well as your professional experience, which is, latterly, being deployed in advising HS2 and the Secretary of State.

503. MR KING: Yes.

504. MR MOULD KC (DfT): Right, thank you. I've got a series of questions for you. The first one I think we might have up, P418(6), and this sets out the hybrid Bill proposal and it identifies, in the right-hand corner, the train service specification which the station is designed to accommodate; is that right?

505. MR KING: That's correct, yes.

506. MR MOULD KC (DfT): And just read through that slide; it tells us that it will operate as a terminus station for HS2 services from London and will allow for NPR services to enter and turn back to onward destinations. Examples are given and we see

that, for planning purposes, it's assumed to dwell for five minutes at Manchester Piccadilly; that is NPR services are assumed to dwell for five minutes at Manchester Piccadilly for passengers to board and alight for the train to proceed on its onward journey.

507. Is there actually anything you want to add to that in terms of the station proposition and the train service specification for which the Bill station has been designed?

508. MR KING: Yes. I think it's useful that we put a little bit more context around the train service specifications. So it's not just the funder and sponsor setting out the number of trains they want to operate. It sets out the size of trains they want to operate. It also sets out the performance they need to achieve. It also sets out where they need to change that size of train by splitting and joining to accommodate peak time growth, etc.

509. So the train service specification is not just about the number of trains; it's about the performance the system needs to achieve, it's about the size of the trains that need to operate on it to meet demand, and it sets out not just that number of trains that need to operate.

510. I think the other key thing is also that the NPR train service specs have been consulted via TFN. So the funder and the sponsor has set out, 'This is what I want to achieve', and that's how we set out the design of the station, taking into consideration the number of trains that need to operate, the performance that needs to be achieved and any other circumstances where we need to split and join services.

511. MR MOULD KC (DfT): Thank you. Now, if we go to P418(9), you can see there – I don't need to read that out – it summarises the position on capacity. Is that essentially a summary of what you just told the Committee?

512. MR KING: Yes, that summarises it. I'll just add a little bit to that, I think, other things that need to be understood. From an HS2 service provision, we need to take into consideration what HS2 is doing as a network, and that involves taking into consideration Euston station, Curzon Street and Manchester.

513. The timetable is constructed from Euston because that's the point where

everything comes into and goes out to. So places like Curzon Street and Manchester are receiving what the rest of the network can do.

514. The wider systems perspective needs to be considered in terms of the NPR. So obviously we've got the new NPR tracks. They will then go on to Network Rail and we need to understand what they are capable of taking at any point in time with the working assumption at the moment, with the schemes that are going on, it's a maximum of eight trains per hour.

515. We have constraints east of Marsden, we have constraints from Hoo junction approaching Liverpool, so that restricts the number of trains that could be operated out of there.

516. So the node of Manchester and the spur has to consider what the rest of HS2 is doing, its interaction with the rest of the network, as well as the interaction with the rest of the east/west services traveling across from Liverpool, eastwards.

517. MR MOULD KC (DfT): Is that essentially an operational expression of the investment package that is set out in the integrated rail plan?

518. MR KING: Yes.

519. MR MOULD KC (DfT): You heard evidence from Mr Lax and yesterday from Mr Palmer that, if one was to substitute the preferred network, which the Greater Manchester partners say they would advocate, which would – their scenario 3 in other words – you heard evidence that the Bill station could accommodate that enhanced service specification in the event that it were to be enabled by further capital investment elsewhere on the network.

520. MR KING: Yes.

521. MR MOULD KC (DfT): Do you agree or disagree with that evidence of Mr Lax and Mr Palmer?

522. MR KING: You require further funding on –

523. MR MOULD KC (DfT): No, the Bill station could accommodate scenario 3.

524. MR KING: Yes, the Bill station can accommodate that, yes.

525. MR MOULD KC (DfT): That's your position too.

526. MR KING: That's my position.

527. MR MOULD KC (DfT): Okay.

528. CHAIR: That was the eight plus three, wasn't it?

529. MR MOULD KC (DfT): Yeah. And that was based on an eight-minute dwell time for NPR services.

530. MR KING: On that option, yes.

531. MR MOULD KC (DfT): Yes. Now, can we just delve back, briefly, into how these things came to where they are? If we could just put P418(21)?

532. CHAIR: I missed – Grahame, I think wanted to come in at this point. Sorry, Mr Mould –

533. MR MOULD KC (DfT): I'm so sorry.

534. MR MORRIS: Just before you move off that point about capacity and planning ahead, I just wonder, are you familiar with the written statement that was published yesterday from the Rail Minister on behalf of the Secretary of State in relation to HS2? Have you had a chance to digest that?

535. MR KING: No.

536. MR MORRIS: Oh, well. The next question's pointless in that case. Thank you.

537. MR MOULD KC (DfT): If there's a question that you would like answered by the promoter arising out of that, please do let us know and I will make sure we give you an answer to that question. Yeah.

538. So yes, if we just turn up – we've got it on screen – P418(21). Just remind us, before the need to enable NPR services out of Manchester Piccadilly station came into view, what was the assumed number of platforms required to serve HS2 services

terminating at Manchester on the western leg of HS2?

539. MR KING: Using the 2013-2016 preferred route announcement, that would have been four platforms.

540. MR MOULD KC (DfT): Four. And then with the instruction to enable NPR services to operate out of that station, one then sees that number of platforms increased by two to six, I think.

541. MR KING: You're looking at four extra trains per hour coming in, so there're an additional two platforms.

542. MR MOULD KC (DfT): Yeah. Now, we know that the dwell time assumption for HS2 terminating services is 25 minutes in Mr Palmer's evidence. Again, is that an assumption that you're prepared to accept?

543. MR KING: That's a reasonable assumption for the purpose of what we're looking at.

544. MR MOULD KC (DfT): The assumption that Mr Palmer has advocated for the purposes of NPR dwell time was eight minutes, and we've already covered what that means in terms of scenarios 2 and 3 in the surface station. There is, though, discussion in the documents of the use of the technique known as stepping back in order to enable confidence in achieving that planned five-minute dwell time. That five minutes, am I right, came essentially from Transport for the North?

545. MR KING: That's a sponsor requirement to achieve five-minute dwell time for journey time requirements.

546. MR MOULD KC (DfT): And if we turn up P418(10), we see the promoter's position in relation to achieving that requirement. Now, Mr Palmer expressed some concerns about whether it was reasonable to assume the use of the stepping back technique in order to achieve the sponsor's requirement of five minutes' dwell time for NPR services. Do you share his concerns about deploying that technique in order to satisfy and sponsor's requirements or not?

547. MR KING: No. For me, it's an operational technique that you use for specific

reasons. This is one of those specific reasons where we'd want to use an operational technique. A key aspect of making that work would be your train crew strategy and your appropriate diagrams would need to match that train service specification.

548. MR MOULD KC (DfT): Could we just be clear what the trade term 'diagrams' is referring to? What do you mean by your diagrams?

549. MR KING: It's how the drivers are allocated to work trains. It's their roster really, like it's showing how they work their trains, in simple terms. And you would have someone specifically there to take that train.

550. MR MOULD KC (DfT): Yes. It implies, does it, potentially a greater number of drivers being available to take a train out of Manchester station after that train has come in and is ready to turn back?

551. MR KING: Yes.

552. MR MOULD KC (DfT): And if we turn to – so there's a resource implication there.

553. MR KING: There is a resource implication, yes.

554. MR MOULD KC (DfT): If we turn to P429(5). This is a note which we provided to the petitioners in May, I think, or the beginning of this month perhaps. And you can see section 4 of that note is entitled, 'Resourcing requirements for stepping back', do you see?

555. MR KING: Yes.

556. MR MOULD KC (DfT): 4.1.2 tells us that the scale of that additional resource has been tested by running a software model called Train-TRACS.

557. MR KING: Yeah.

558. MR MOULD KC (DfT): A software used to produce train crew diagrams. It was run twice, first, without stepping back to use as a baseline, and once with the rules using stepping back of drivers at Manchester Piccadilly. Just help us; does the table give us an indication of the predicted increase in driver resource that would be required in order to

operate stepping back in relation to NPR services at Manchester Piccadilly?

559. MR KING: Yes.

560. MR MOULD KC (DfT): Plus 19%, or in real money, an additional six driver diagrams, I think is the way it's put, isn't it?

561. MR KING: Yes.

562. MR MOULD KC (DfT): Is that essentially a matter for the train operating company to build into their resource plan and thus to negotiate in terms of their operating contract?

563. MR KING: Yes. It's what they've got to do; they've got to factor that into their train crew resources and factor that into how much that would cost them.

564. MR MOULD KC (DfT): Mr Palmer's other point is that he's not able to point to an example of a station such as the NPR station at Manchester Piccadilly, the Bill station – he's not able to point to an example of where stepping back has been deployed in this way at the moment, or hitherto. Does that cause you concern?

565. MR KING: As I said earlier, these are operational practices along with many operational practices that deliver a train service, whether it be bringing a train out of a siding or a depot facility, whether it be making sure the train runs smoothly, meeting its timetable, managing dwell time. All these aspects are part of operational elements that need to be managed in a chain of events that deliver the train service.

566. MR MOULD KC (DfT): Is there any evidence before the Committee of it being used in an intensively used mainline station and failing?

567. MR KING: No.

568. MR MOULD KC (DfT): But in any event, just to set the context, it's common ground, but in order to deliver the 11 trains per hour scenario 3, in practice you wouldn't need to operate to a five-minute dwell time; you would have, on the common position of both parties, eight minutes available for the turnback.

569. MR KING: Yes.

570. MR MOULD KC (DfT): Yeah. Yeah. Okay. Can we then please just turn to the question of smooth running and perturbation? Firstly, in relation to the Bill station, can we put up P418(12)? Mr King, this is a schematic that highlights the six platforms and assumes they're devoted to specific roles. So 3 and 4 are devoted to the HS2 terminating services, 1 and 2 to the NPR services coming in from Liverpool and going to Leeds, 5 and 6, the other direction, coming in from Leeds and going to Liverpool. Yeah.

571. Can you help the Committee: on the basis of that platform resource and having regard to the main operational specification that, as you told us earlier, this Bill is designed to achieve, does perturbation present, in your view, an unmanageable risk?

572. MR KING: No, it doesn't. And I'd also add the layout of that station, as you can see, is colour-coded for NPR services, HS2 services. That layout design, that functional design to meet the train service specification also seeks to get to the point of the sponsor's requirements that, where possible, we can separate out the HS2 services from the interaction with the rest of the network.

573. MR MOULD KC (DfT): And how is that achieved in practice?

574. MR KING: You have specific two platforms for HS2. You have your services from Leeds, or going out from Leeds to Liverpool and the services coming in from Manchester Airport.

575. MR MOULD KC (DfT): We can see that physically the infrastructure is grade separated so far as the –

576. MR KING: In terms of heading out to the east, it's grade separated so you don't get a conflict of move going through them.

577. MR MOULD KC (DfT): And the western NPR services, they're using the HS2 mainline for Manchester Airport, I think.

578. MR KING: Yes.

579. MR MOULD KC (DfT): The Committee knows about that spur to accommodate the Liverpool junction at Hoo Green, or just to the north-east of Hoo Green.

580. MR KING: And as I say, I think the key part is with that design as well, that allows us to meet that sponsor specification and we can absorb a bit of resilience because of perturbations occurring on the wider network. So HS2 can meet its performance targets and it's cushioned from some of the perturbations that may occur in the wider network.

581. MR MOULD KC (DfT): That's a function, is it, of having the six platforms available?

582. MR KING: Yes.

583. MR MOULD KC (DfT): Yeah, I see. So then we turn to the underground station and can we just put up – well, it's not so much whether it's underground or overground; the contrast is between six and four platforms, I think.

584. MR KING: Yes.

585. MR MOULD KC (DfT): So if we turn to P418(24). The Committee saw this yesterday, because I asked Mr Palmer about it, but what's the point that's being illustrated on this slide?

586. MR KING: The point that's being illustrated on this slide is that, if one of the HS2 services on the middle platforms is unable to depart and they're – I'm not going to bore the Committee with this – there's 101 reasons why you do things with holding back trains. They could be external reasons, they could be internal reasons; what if the cows come home? Essentially that train is unable to move. Therefore, the incoming HS2 service is occupying that platform 1 which then means the train behind it has to then make its way over to platform 4, if you're numbering from 1 to 2 from the top.

587. MR MOULD KC (DfT): Is that a problem that only arises in relation to the scenario for the through running HS2 services, or is that a problem in which, in your judgment, would arise under any of the operational scenarios that we are dealing with?

588. MR KING: In terms of through running, you're only operating your train service off two platforms. Your HS2 terminating platforms are occupied for a great deal of time, so therefore you are having to use one of those two platforms to negate any problems that are occurring.

589. MR MOULD KC (DfT): And is that a risk that applies therefore on scenario 2 and scenario 3 as well as scenario 4?

590. MR KING: Yes.

591. MR MOULD KC (DfT): It is. Yesterday, Mr Palmer said that the position had changed in the light of some additional information given in the statement of common ground. I wonder if we could just put up A74(9)? There we go.

592. We think Mr Palmer was referring to what said at 2.23 on this page where the GM partners' position is on the left-hand column, refers to a report provided by HS2. 'Platform sharing would give the same flexibility in the four-platform station as shown in the six-platform top diagram', and the answer is, 'Agreed. However, that brings operational risk due to the potential for a blocked platform and potential passenger flow management issues if two trains are loading and unloading concurrently'.

593. Can you just explain that to me? Is it helpful to go back to that diagram we were looking at?

594. MR KING: If you could, please.

595. MR MOULD KC (DfT): So P418(24).

596. MR KING: So if you look at the through platform where the HS2 train is arrived, if you were using platform sharing, you'd bring a 200-metre train in and you'd bring another 200-metre train behind it. Providing nothing happens with the train that's gone in first, you're good to go, but if you have a problem or delay – because of passengers will get confused with two trains in there at times.

597. Again, there's a range of problems that may occur operationally that means that that train is not able to depart the way they wanted it to and the platform sharing train behind is also caught up in the problem.

598. MR MOULD KC (DfT): Can we then come to the question –

599. MR KING: I'll just explain as well; when you use that –

600. MR MOULD KC (DfT): Do, certainly.

601. MR KING: – on the surface platform, you actually are able to put the train down there and operate round it. It will sit on the buffer stops. You can bring another train on top of it, take it back out again. So in terms of platform sharing, the turnback station provides better mitigation and perturbation in that way.

602. MR MOULD KC (DfT): Right.

603. MR KING: Bearing in mind you only have two platforms you're trying to operate off here.

604. MR MOULD KC (DfT): And can we come then to the question that Mr Cameron was going to – I think wanted to raise with Mr Smart but I expect he'll pursue it with you. Just put up A64(54), please. This goes to the operational requirement for a turnback facility and Mr Cameron's question was predicated – I don't think he accepted it – but he was saying in the event that the judgment is that some sort of turnback facility is required to accommodate scenario 4, which assumes that HS2 services are running through the platforms further west, is it necessary to provide a turnback facility in support of the four-platform station under scenarios 2 and 3 or either?

605. So can I have your view on that, please? Would there be an operational need, in your view, for a turnback facility, not only in scenario 4 but also in scenario 2 and 3?

606. MR KING: It's our view to meet the resilience required and that separation to meet the sponsor's performance targets of HS2, you would need to have turnback sidings. It's not just about meeting the train service, it's about meeting that sponsor's requirement that we need to be able to segregate out the services. And if you're operating just off two platforms, you're going to get those services intertwined with each other at some point in order to manage that mitigation.

607. MR MOULD KC (DfT): I see. Okay. Which brings me really to my final question for you, which is, you're, as we've seen, a professional in this field with practical experience. In the light of that experience in relation to rail operations, what would your advice be to the Secretary of State for Transport? If he said, 'Mr King, should I build – should I commission a four-platform station to serve the train surface specification that is required to meet mine and the sponsor's requirements at Manchester, the terminating HS2 services and the through running NPR services?',

would your advice be, 'Yes, a four-platform station will do it'?

608. MR KING: No, not with this train service specification.

609. MR MOULD KC (DfT): Right. Thank you very much indeed.

610. CHAIR: Thank you. Just to follow on from that, before I ask Mr Cameron; I have a couple of questions. If the Secretary of State were to ask you what would be preferable, would it be through running NPR services or these switchback services, which would be preferable from a passenger experience point of view and from an operational point of view? What's better, a running through service or a switchback service?

611. MR KING: I think passengers alighting and getting on those services don't really care whether it's going through or not, don't they? They're just getting on and getting off.

612. CHAIR: They care how long it takes on their total journey time –

613. MR KING: Correct, it takes – and that's why the dwell time for five minutes has been set for the surface turnback facility. I think once most people are on the train, as long as it's been easy and accessible to get to the train and get off the train and get out of the train, once they're on there, they tend to not worry too much unless that dwell time starts creeping up while they're sitting there.

614. CHAIR: The second question is, does a step back facility in your view increase the risk of delay?

615. MR KING: If you manage things, no, it doesn't increase the delay. You've got to set your stall out and manage it accordingly. So with this, this will be a station that's designed to deal with this. This is not an existing station. This is a new station that could be set out to meet that operational requirement. The rolling stock can be set out to meet that requirement and you make sure that your crewing establishments are there to meet that requirement.

616. CHAIR: Okay. Thank you. Mr Cameron.

617. MR CAMERON KC: Thank you, sir. Good morning, Mr King.

618. MR KING: Morning.

619. MR CAMERON KC: I'd like to start on the capacity of the surface station. You started on the planned approach and the planning is that the station's been designed to accommodate a train service specification which, as you pointed out, does not only relate to number of trains but timing and other major specifications. Is that right?

620. MR KING: Correct, yeah. Size, length of trains, number of trains, performance requirements.

621. MR CAMERON KC: One of the performance requirements which the sponsor seeks to impose is a five-minute dwell time for through NPR services, isn't it?

622. MR KING: Yes.

623. MR CAMERON KC: The reason that the sponsor wishes to impose that is to avoid delays for through running passengers; so, if you're on a train from Liverpool to wherever you're going, you're not getting off at Manchester and you don't want to be delayed in Manchester for longer time than you have to, do you?

624. MR KING: No.

625. MR CAMERON KC: Yeah, and that's why –

626. MR KING: You want the timetable to do what it says it's going to do.

627. MR CAMERON KC: Yes, that is one of the main reasons why that specification is there, is it not?

628. MR KING: Yes, to achieve a journey time.

629. MR CAMERON KC: Yes. To avoid unnecessary delay in Manchester for through passengers, correct?

630. MR KING: Yes, to achieve a journey time.

631. MR CAMERON KC: There's no point having a higher speed rail service if it then has to grind to a halt while it turns back in Manchester.

632. MR KING: In terms of NPR, it's running at higher speeds when it's on that part of the infrastructure, but it's not on that part of the infrastructure, no, it's running at different speeds.

633. MR CAMERON KC: Let's turn to the capacity and operations assessment, which is P427, and this is a document which I think was approved by you, was it not?

634. MR KING: Yes.

635. MR CAMERON KC: It's got your name on approval section. And if we go, please to 427(13). Go down a bit, please to 5.3. You might have to go on the next page, sorry – 5.3 and 5.4. Maybe on (14). That's it, 5.3. So the assumed train service specification is set out there and that's NPR core, which is six trains east to west, and that's in addition to three London Euston to Piccadilly terminators.

636. MR KING: Yes.

637. MR CAMERON KC: And then if we go to 5.4 we've got futureproofing and that is the eight. So this station has been designed for 11 trains an hour in each direction, max, isn't it? Eight plus three.

638. MR KING: Eight plus four.

639. MR CAMERON KC: Four, that's the extra HS2 is it?

640. MR KING: That's the extra HS2 Manchester Piccadilly.

641. MR CAMERON KC: That would take it up to 12 trains per hour.

642. MR KING: Yeah.

643. MR CAMERON KC: So it's not been designed, the station, to accommodate the capacity of the spur, whether it's 14 or 15 or whatever one takes as the capacity of the spur, it's not a design intention that the station match the capacity of the spur, is it?

644. MR KING: The station has been designed to meet the train service specifications set out.

645. MR CAMERON KC: So it's been designed to meet the train service specification

and therefore has not been designed to meet the capacity of the spur, has it?

646. MR KING: There is a different view of how the capacity of the spur has been calculated.

647. MR CAMERON KC: Yeah. But even if there's a different view, even if it's 14 or 15, the station has not been designed to accommodate 14 trains an hour, has it?

648. MR KING: It has. It includes two paths per hour to enable stock to backwards and forwards to Crewe. So that is 14 trains per hour.

649. MR CAMERON KC: 14, but it's not been designed for 15, has it?

650. MR KING: No.

651. MR CAMERON KC: Thank you. And let's just turn to operational performance of the surface turnback. Now, specification five-minute dwell time and you can only achieve that if you adopt stepping back, is that right?

652. MR KING: Stepping back manages any risk associated with not achieving it.

653. MR CAMERON KC: The current approach, current, is to adopt stepping back as a method to achieve five-minute dwell times. That was not initially stated by HS2 until the GM partners raised this as an issue, was it? You didn't refer to stepping back until this was raised, dwell times, were raised by the GM partners, is that right?

654. MR KING: I can't recall who raised it but stepping back was a part of the process that we went through for looking at how we run this service.

655. MR CAMERON KC: Well, let's not dwell on the past. Can we go to P427(24), please? There, 7.4.1 at the bottom, 'HS2 Ltd agree with the MM TfGM' – so that's Mott MacDonald – 'TfGM operations and capacity assessment that to achieve a five-minute dwell time requires a change of driver on every NPR service. So this is your report, or one you approved and you've agreed with Mott MacDonald.

656. MR KING: Yeah.

657. MR CAMERON KC: And if we turn, 'HS2 Ltd agreed that applying this method of operation on every service and relying upon' – and let's go on to the next page – 'this

to deliver the timetable is not common practice for a mainline or high-speed railway operation'. So that's your report; you're saying that this is not common practice for the type of operation you're seeking to promote; is that right?

658. MR KING: It's not an operational practice that's used throughout the network at all at the moment, no. Doesn't mean it can't be used and the train is not moving so it's not at high speed when you do that change.

659. MR CAMERON KC: They're your words or – not my words, 'not common practice'; I would have thought you could agree that, that's what you've said.

660. MR KING: Not common practice, agree.

661. MR CAMERON KC: Yeah. And so the system has been designed in order to meet a specification and it can only meet that specification if it adopts a method which is not common practice; is that right?

662. MR KING: Yes.

663. MR CAMERON KC: And that is from day one of the running of NPR services, you have to adopt something which is not common practice, correct?

664. MR KING: Yes.

665. MR CAMERON KC: Now, you touched on this, but is there any example of that method being employed on a new high-speed network which doesn't run as a dedicated or closed-loop network?

666. MR KING: Can you repeat that again? Sorry.

667. MR CAMERON KC: Is there an example of that method being employed on a new high-speed network which does not run on a dedicated or closed loop network? No?

668. MR KING: No.

669. MR CAMERON KC: Was stepping back adopted on TransPennine in an attempt to resolve some of their issues with delay?

670. MR KING: In terms of delay perturbation, they looked to do that.

671. MR CAMERON KC: They looked to do it; did they do it?

672. MR KING: No. But that's because of their underlying train crew issue. As I pointed out, this is an operation that you'd need to put the resources behind, plan to do it, set yourself out to do it and can be achieved, albeit, I agree, it's not common practice, but it's an operational procedure that can be adopted and used. You have to have the underlying resource plans to achieve that.

673. MR CAMERON KC: But you're saying that TransPennine looked at it but didn't do it.

674. MR KING: I don't know the full details of what they did or didn't do. I'd heard various anecdotal evidence that they looked to do that.

675. MR CAMERON KC: You're putting forward a method of operation; did you not think it wise to investigate whether it had been considered or employed on other railways, particularly those going east/west, across the north?

676. MR KING: You only have to do that if – I'm just trying to think – with TransPennine, it's a well-known fact they had problems with their train crews. So therefore, to look to that as an example of deploying an operational practice that requires discipline and resources to do it, I'm not sure why I would do that, because I'm actually saying I'm planning to do that.

677. MR CAMERON KC: So you didn't look at TransPennine, no? It hasn't been employed elsewhere on a service which isn't a dedicated service, so presumably you didn't look at it in operation on any other high-speed network because there isn't one where they use it.

678. MR KING: Not on high-speed network, no. But these are Northern Powerhouse Rail services that are using high-speed facilities. They are a regional intercity that happened to use that facility for that node and that link to come off the network, go across, go back onto the network. High Speed 2 services don't do it.

679. MR CAMERON KC: Let's have a look – we're still on the surface turnback –

let's have a look, if we can, at the ability to withstand disruption; I think the railway term is perturbation and can we just have up in front of us, please A67(14)? This is just a convenient place, this is from Mr Palmer's exhibits, and he's quoted from various documents which have been produced by or on behalf of HS2.

680. MR KING: Yeah.

681. MR CAMERON KC: So this sets out HS2's position. This position is set out on the basis of the proposed surface turnback station, is it not, being part of the NPR network?

682. MR KING: I think you'll find point one examines the report we've done into the four-platform underground station.

683. MR CAMERON KC: Point one does examine that, but as far as the application of more than one minute's delay, this is under surface turnback station of Mr Palmer's slides; we can go to some of the documents if we need to. Is there any dispute between us that, if you get – let's say point two, the application of more than one minute's delay in the platform for reversing services incur significant reactionary delay. That's dealing with reversing services, isn't it?

684. MR KING: Yes. I'd like to see the context of what that's saying because I can't recall all the documentations. But to draw that out on its own may have a context around it.

685. MR CAMERON KC: Okay. But is there any – we can turn to one at a moment, or Mr Mould can take you back to context if he wants to – but is there any dispute between us that if you have a one-minute delay, you get reactionary delay, and that is using the surface turnback station?

686. MR KING: You can always get delay, a minute is a delay, yes.

687. MR CAMERON KC: Yes, but it's –

688. MR KING: It's whether it's a consistent delay or whether it's a one-off delay or whatever you're looking to manage.

689. MR CAMERON KC: That's not the question. The question is whether it results

in significant reactionary delay. The one minute is the delay to that service, but it's the impact that it has on other services.

690. MR KING: I think I'd need to see the context of what that was made in.

691. MR CAMERON KC: So let's take the next one and let us go to that point. That's based results in calculated, the timetable becomes unstable if services either arrive at or accrue more than two minutes' delay at Manchester Piccadilly'. Is that something –

692. MR KING: If I recall correctly with that one, that's saying that you're consistently delivering a train service that's two minutes late. So there's a consistency around it, not a one-off.

693. MR CAMERON KC: Well, let's deal with this in a different way. Let's go to A67(21). This is where Mr Palmer has made a comparison between surface and underground, and he has used modelling software to determine how long it takes before the system deteriorates as a result of delay. Have you performed a similar exercise?

694. MR KING: The team looked at what would happen with delay, yes.

695. MR CAMERON KC: In your evidence before the Committee, have you produced a similar table?

696. MR KING: Not the same as that, no.

697. MR CAMERON KC: Do you accept the outcome of Mr Palmer's work?

698. MR KING: I've no reason not to accept it. However, what I will say, Mr Palmer's work and our work, what that does indicate is if you do not manage dwell time, you run yourself into a problem. The management of dwell time is a critical aspect of the everyday railway as it exists today, so I wouldn't say what he's put down there is wrong. There is quite often a fact when you model some of these scenarios that it will give you what you're looking for in terms of output with a straightforward input. It's not actually looking at taking any management action to manage the delay down. So all things be an equal, if you do nothing you may get that. The same is our chart will say if you do nothing, you'll get that. So therefore, it points you to the management action that you need to take to operate railway.

699. MR CAMERON KC: Yes, but what this is, it's a comparison between the operation of the surface and the underground, and the underground is longer before everything goes horribly wrong in the underground than on the surface; I'm putting it in colloquial terms, but that's the effect of this slide, isn't it?

700. MR KING: That's what he's saying on that slide, yeah.

701. MR CAMERON KC: Yes. And as you've said, the whole system is very susceptible to prolonged dwell times. If you introduce stepping back, you introduce an additional potential cause of extended dwell times, do you not? Because you have to make sure that the driver's there and you wouldn't have to if you didn't have stepping back?

702. MR KING: The point of getting your plan and your resource right is the driver will be there. This is a planned operational activity, not one of doing something under perturbation. You're actually planning to do that and therefore the driver will be there.

703. MR CAMERON KC: You're introducing an additional potential cause of extending dwell times which wouldn't exist if you didn't have stepping back; that you must agree. You have to.

704. MR KING: I'm not planning not to.

705. MR CAMERON KC: Yes, but the best laid plans of mice and men can go wrong, can't they?

706. MR KING: But that could be said of anything that's going on – on any report produced by us or Mr Palmer, in the sense that the best laid plans of mice and men, something could go wrong. The operations has to manage that.

707. MR CAMERON KC: But this is an additional factor which wouldn't exist with an underground station, correct? If you had an underground through station, you don't need stepping back, you do need it on the surface. So it's an additional potential cause of delay.

708. MR KING: You still may be changing crews on the underground station.

709. MR CAMERON KC: I'm not suggesting you need stepping back on the

underground.

710. MR KING: No, no, I'm not suggesting you need stepping back. But every day, somewhere on this railway, a crew change is taking place, whether that be to step back in this fashion which is what we're saying is the way we would operate this railway, or on a through service where you need to change the crew over for whatever reasons. It's a standard operational practice again. It's not unusual.

711. MR CAMERON KC: Right. I'm conscious of the time –

712. MR KING: Needs to be managed.

713. CHAIR: Just on that – just to come in here, Mr King – but on a through service, the crew change would normally take place at the terminating station at either end, wouldn't it?

714. MR KING: Not necessarily, no. As an operations manager, I crew trains at Hitchin, Peterborough, Finsbury Park.

715. MR HIGGINBOTHAM: We always have a crew change at Bristol.

716. CHAIR: Thank you.

717. MR CAMERON KC: So I'm conscious of the time and the time that you had –

718. CHAIR: No, we'll go on for a couple more minutes because I want to finish this point, because I do have another question for Mr King as well. Having been corrected on the crew changes, so I can't be expected to know because I always start at a terminating station, but you've accepted, Mr King, you accept the premise of Mr Palmer's slide which is before us now.

719. So I just want to be clear here: do you accept the premise then that, a surface terminating switchback turnback station has a greater risk of delays to services than a through underground station? Is that what you're – because that's what this slide shows. Are you accepting that?

720. MR KING: No.

721. CHAIR: I thought you did a moment ago to Mr Cameron?

722. MR KING: What I'm saying is the report as it sits there is describing what would happen if these delays would occur and you do nothing about it. You've always got to step in and operate your railway effectively, and that will mean paying attention to what's going on around it.

723. It's a known fact with the HS2 services that the interaction with the conventional network has got to be managed very well, hence why the sponsor's requirement is to try and segregate and separate out those services. So if you get a big delay of the national network, you can carry on operating your high speed network.

724. For me, these are bits that are not invalid but they're actually saying to you, you need to do something. If you have this happen, then you need to go to it.

725. CHAIR: I understand that but it's whether you're adding in an additional risk factor, isn't it? Which if every NPR service at Manchester has to change driver, that is an additional risk of delay that would not occur, assuming it was an underground station where there wasn't a crew change taking place.

726. MR KING: So in using step back drivers, two things you could do; you could take the risk of, 'I'll let that driver get out and go down the end and start again', so it's just a crew change and using the same driver, or you could manage the risk of that not working by having a step back driver that is there ready to take that train out. That's the operation that we're looking to do, and that is also part of trying to make sure that we don't cause any problems with the HS2 services in terms of their performance criteria.

727. CHAIR: Okay, thank you. Mr Cameron.

728. MR CAMERON KC: Thank you, sir. I just want to – because you've given two inconsistent answers – because you said you had no reason not to accept Mr Palmer's slide A67(21) and you've just told the Chairman that you don't accept it.

729. MR MOULD KC (DfT): He didn't say that. Sorry, I mean, it's important that we're clear on this.

730. MR CAMERON KC: Yes.

731. MR MOULD KC (DfT): He said he accepted that what Mr Palmer had shown

was that there was a risk that you would need to manage but he's saying that he's comfortable that it could be managed through proper resourcing.

732. CHAIR: I mean maybe we're all saying the same thing, but my understanding was from your responses earlier, Mr King, was that you accept that – I've made a note of it, 'Stepping back has a greater risk of delay', or adds in a risk which isn't there if you don't have to step back at a through station. I mean, whether it's underground or above ground. I mean that's just a statement of fact, isn't it? If you're adding an extra driver, an extra crew into the scenario on every single service that's terminating at Manchester Piccadilly – well, that's switching back at Manchester Piccadilly and you didn't have to do that underground, that is an added risk that doesn't exist on a through station, right?

733. MR KING: If you're running through, no.

734. CHAIR: If you're running through and you're not changing driver. That's just a blatant statement of fact, right?

735. MR KING: Agreed.

736. MR MORRIS: The additional cost we're agreed on in Manchester, it is almost 20%, 19%. That's the additional cost to the operator, which presumably will be passed on, of the stepping back, because of the need for additional drivers. I think it was six in total.

737. CHAIR: Just to be clear on this then, if a crew change is normal whether it be at Preston or Peterborough or wherever else, why is there an additional cost, if that's a normal thing, we're just doing it Manchester Piccadilly instead? Is there an additional driver change then proposed?

738. MR MORRIS: Drivers require it.

739. CHAIR: I get that, but Mr King a moment ago said that crew change is perfectly normal on every route, so I'm unclear as to whether having more driver changes on this or not.

740. MR KING: We are specifically looking to have that step back driver as part of that operational activity, not a crew change by bringing that driver and letting him start

again and take the service out. It's a specific driver to be ready to take that train out on the NPR services, on the HS2.

741. CHAIR: Let me get my head round this. So the Liverpool to York service on the Manchester Piccadilly above ground option, there is, on every Liverpool to York or Liverpool to Hull service, a change of driver at Manchester Piccadilly.

742. MR KING: Yeah.

743. CHAIR: If it were an underground station running through Liverpool to York, how often would there be a crew change on that? Would it be on every single journey or would it...?

744. MR KING: It would vary depending on the terms and options, but you would probably have a crew change somewhere along en route.

745. CHAIR: Every single route, every single journey along that route?

746. MR KING: Depending on the terms and conditions that the drivers are working to.

747. CHAIR: Okay. So where does the extra –

748. MR KING: Foolish to say yes, in the sense that I haven't got –

749. CHAIR: Where does the extra 21% or whatever it was come in then if we're doing a driver change on every single Liverpool to your York service –

750. MR KING: That's taking the timetable that's been developed against the train service specification and then setting out a set of diagrams against that to demonstrate what changes that would happen if you didn't do the step back facility versus leaving it alone. That is showing the delta difference in what you need to achieve that.

751. MR MORRIS: Have you got that slide? I can't remember the number of it.

752. MR MOULD KC (DfT): Yes, P429(5).

753. CHAIR: I'll just go back to Mr King and then we will break because I've once again gone way beyond what I said. 12.05 I said we'd end. Sorry. Okay. Right, so it is

a fact then, there are fewer crew changes on through stations. I thought we were – we seem to be one point –

MR MORRIS: He said –

754. CHAIR: Well, it sounded to me that it was though, Grahame, because we were told that there's a crew change on every route anyway. Well, there are more crew changes on this, on a step back thing, right? Which is where I was confused because I thought the witness was saying that there would be the same number of crew changes because a crew change is always required, whether it's Manchester Piccadilly, whether it's at Leeds or whether it's York or whatever but there are more required –

755. MR KING: Number of drivers require to achieve the step back.

756. CHAIR: Right, yeah. So you have to have more changes.

757. MR KING: Delta. It's not more changes, it's more resources required to achieve that delta in the step back.

758. CHAIR: Yes, okay. Right, thank you. Mr Cameron.

759. MR CAMERON KC: Thank you, sir. I'm going on to underground station and whether you need a turnback.

760. CHAIR: If you're moving on to a new issue, what I might do is then bring the Committee to a close now and then we'll reconvene at two o'clock if everyone's in agreement on that. So I think that's reasonable.

761. MR CAMERON KC: Yes, sir, and I understand that Lucy Powell MP is coming at two o'clock.

762. CHAIR: Two, yes.

763. MR CAMERON KC: So we will clear the decks here to let her appear and reappear when she's –

764. CHAIR: Then yourself and Mr King will reappear after Lucy. Excellent. Okay. That's the end of this morning session.