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18th June

Pre cross examination points

-Dyson Bircham Bell asked to carry out audit check that all docs submitted to programme officer (not kept with Promoters or PINS)

-Promoters to update the statutory objectors list

-Clarification of para 6.7 – 50% increase in public demand for transport along the corridor – Hanson did suggest that he would clarify this statement in his proof. Dr Dickinson is expecting some amplification of his answer during cross-examination. Cameron states that he will submit a note if necessary.

Continuation of examination in chief of Neil Chadwick

Qc – subject of quality report – c-2-4 – quality factors report. You’ve explained that these quality parameters for leeds transport model were supplied by sdg and described the process – can we take up c-2-4 and look at the circulation – comes immediately under the date.

Nc – this is the first page of appendix A

Qc – yes the service quality parameters – the first thing referred to is dft – who was it sent to?

Nc – sent to dft team that assess the business case – the note itself is written to account discussions that we’d had with the dft.

Qc – so it was sent to dft for them to consider – what was the outcome

Nc – they accepted our view on what the quality factors should be – they did award programme entry to the ngt scheme in 2012. They did adjust the benefit cost ratio but our understanding it is that none of those were related to the quality factors employed. So from that we take they were satisfied with how we employed them

Qc – nwlft-114-2, we can see that that document is an extract from a report prepared by Aecom on soft measure values which was prepared as a report to dft. Table 0.2 – value of bus soft measures. If we go back to doc c-2-4 and go to page 8 and we can see a table – figure 2 of the aecom report extract – were you aware of and did you take account of the aecom report to dft?

Nc – yes, asked us to make a comparison between the factors we were employing and that that was coming out of their own research coming out of the aecom report – figure 2 is identical to table 0.2 (relevant figures identical) – extracted from that table. The dft explicitly asked us to make these comparisons – they came to the view that yes, the soft factors are higher than those that came out of the aecom report but that’s what they expected.

Qc – c-2-4 quality factors – one particular factor talked about by bonsal in questions to hanson is the value for cctv – how was that arrived at?

Nc – derived from stated preference research undertook for ngt project in 2008.

Qc – figure 11.4.2 “commute” – is that bus stop, vehicle, combination of two?

Nc – combination of the two – if you wanted to make a comparison with the bus soft factor measures you have to add the two together – a little over 5 – the value we had from our local ngt research is quite similar to the value of the generic research which is applicable to bus based systems.

Qc – we know this is derived – c-2-4 para 2, you’ve just referred to those values. If we look at the values of aecom at just over five and you have 4.2 – what is the reason for the variation between aecom and your locally derived factors?

Nc – our factors are locally derived so they represent responses of ppl in ngt corridor as opposed to nationally derived figure. Also our value is derived for the system we are putting forward – the highest possible quality we can deliver within money available – it is specified to this highest possible system and therefore one would expect a higher than average value.

Qc – nwltf in their rebuttal 6.6 say that the scale of the assumed perceived benefits included in the ltn – not consistent with the results of the stated pref work described in c-4-24. Are the parameters that you derived consistent with the stated pref work?

Nc – yes – the process of deriving it is set out in c-2-4 which we prepared at the request of the dft so we can explain how we have done that.

Qc - ok so we are still on these quality factors – turn to your proof 3.40, and we then have your rebuttal to mr cheek – I ask you about a specific point you made there at 2.47 to 2.51 – explain how extensive and in depth those discussions mentioned there were

Nc – notes were prepared in light of the discussions we had with dft – they were fact to face meetings with the dept who had seen documentation in advance (e.g. stated pref report) and those meetings involved a mixture of presentation and discussions and coming out with a set of agreed actions. That took place on a no. of occasions before submission of business case and into the programme entry business case in 2012.

Qc – turn to point made by mr cheek, his proof appendix 1, 4.13, penalties should be applied as a proportion to the in-vehicle time and not as an absolute value for all journeys – he says that was the methodology adopted for other schemes e.g. Croydon/Nottingham. What is your response to that?

Nc- a similar question was asked to mr hanson – he gave a circular answer – he applied parameters as those were the ones he had available. It has been practice elsewhere to employ the parameters in way cheek described, and precedent allows either approach. That approach he describes would not be the right thing to do in some cases e.g. long distance rail journey – however in urban areas such as in leeds, average trip lengths are short and particularly in the variation of trip lengths is quite small so because of that, our view and the view of many others is that actually you get a better model response by having a fixed quality parameters rather than variable. I would say the approach we applied is consistent to what's been done in other locations – the overall view in circumstances where we are modelling ngt this is the best response.

Qc – c-1-11 and mr cheeks rebuttal. 2.17 on page 7 of core doc states [reads out para 2.17 and 2.18] – what did you do with this information here, in relation to ngt and existing bus services which would be able to take advantage of some, not all, of the priority measures

Nc – we adopted a conservative assumption that only half of the improvements would be adopted for the ngt proposals. Similarly at 2.21 we set out that we made the same conservative assumption in regards to the impact to the 8.5% ... ?

Qc – cheek's rebuttal at 3.7 – in effect he's saying that its ok to be conservative in relation to ngt but why are you being so conservative in relation to other buses

Nc – we could have adopted the higher value of 17.5 % which would increase the benefit cost ratio of ngt but our view was that the additional work that we would have to undertake to justify that assumption was disproportionate to the gain in the precision to the cost benefit case – we could have used a lot of the promoters money to show that something v good was actually a lot better – not worth it.

Qc – 3.7B [reads out cheek's rebuttal] - your response?

Nc – it's just complete nonsense, it demonstrates a complete misunderstanding of appraisal theory and assumptions – the way we undertake cost benefit appraisals is that you focus on costs of each individual mode (E.g. car/bus) and you focus on the changes in those modes alone. And once the model has projected it – you work out the de min in each mode. If you do that across each mode then the cost benefit analysis is complete...if you compare it...then it can be incomplete or miss things out – set out in a report written for the dft that this is the way you should do it.

Qc – combining quality and journey times when monetising impact – nwltf point – if we go to nwltf rebuttal 8.2-3 they agree with what you have said [reads out para]. I invite you to respond to that? Why have heritage, landscape impacts etc. not been monetised and included?

Nc – there are two points – in the appraisal we undertook the monetised journey times improvements is a combination of journey times and quality factors – the first is that what we should do is split those out to distinguish between them – which is what dft says. We have sort to address that point in a response to nwltf. The second point is that there are other things that you can monetise that are potentially dis-benefits that we haven't done/not included in cost-benefit – potentially overstating the benefits of scheme. We have done what is consistent with guidance we interpreted and importantly the way we interpret it has been accepted by dft by signal that they granted this programme entry status. It would be highly unusual for those benefits/disbenefits highlighted in the para to include it in a monetised appraisal of an urban transit scheme as this.

Qc – can we go to nwltf rebuttal, 8.3, there is a particular point I want to take up – half way down [reads out – referring to chadwick's appendix 7.2 –on journey ambience] – it says that that is not valued in it. Nwltf-118, bonsall's rebuttal, he actually makes the same point in 2-11.1 bullet 2. He says that your table in appendix 7.2 is misleading as journey ambience not valued when quality has been a factor. You do answer this in app 103...

Nc – it is included in the TEE table...not valued is something simply copied over but it should have said it is 'included in the TEE table' (table 17.1 in c-1).

Qc - So yes he is right, it shouldn't say not valued but refer to the TEE table.

Nc – correct

Qc – nwltf rebuttal 6.5, point which mr hanson did touch upon, crowding factors. The webtag guidance is e-3-17. 6.4.1 of e-3-17 second line says that 'additionally, an overcrowding factor can be applied to in vehicle time' and he also refers to 6.4.4 'for these reasons, crowding should only be modelled where it's likely to have significant effect on timing or where crowding is a significant factor of the scheme. – does webtag require this?

Nc – in this case, at 6.4.1, is says an overcrowding factor /can/ be required – not /must/.

Qc – is webtag guidance prescriptive?

Nc – it is not a set of prescriptive rules and the guidance needs to be interpreted for each circumstance to which it applies. The principle of proportionality underpins that – it is related to the scale and impacts of the scheme and also related to what work is appropriate to allow you to assess the scale and nature of those impacts in such a way that an informed decision can be made on the merits of the scheme. It isn't a checklist of things but must be interpreted. The way you do that in these schemes is through discussion with dft. In major scheme 2009 business case, the scope of modelling work and appraisal was part of long in depth discussion with dft – similarly that happened with 2012 programme entry which by that time we had fully migrated to these models...and again full discussions of nature of technical work made before going ahead.

Qc – seating capacity analysis app 108 and repost of that, fwy 125 called 'seating analysis rebuttal' – they appear to have based their approach on assumption that each seat occupies an average space of 0.45m. this is based on a figure provided by transport committee by rail passenger cars. Are we dealing with rail vehicles?

Nc – we are not. The transport council were simply quoting a figure derived by rail authority to allow them to construct a key performance indicator used to look at rail crowding at places around London – it's a notional value. It is not a measure of the area of a rail seat. Even if it were – I can't see why it is of any relevance.

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Qc – app 134 – pitches for seating capacity in public service vehicles. The response on that is that if you take a min width of seat from relevant public service vehicle regulations – you have done calculations...what is the outcome fo that?

Nc – there is a greater area for standing than the fwy 125 suggests. Therefore standees are less and so the vehicle can accommodate standing in comfort. We go on to identify a no. of current in production vehicles from Mercedes/Volvo etc which are a similar dimension to the vehicles we are looking at [reads out figures]. From that we take a view that the promoters position for that...capacity for ngt could be up to 160.

Qc – you also responded at app 132

Nc – the other analysis in fwy 125 paper, transport for London criteria about assessing crowding on the underground network. What we have done in the second note is to apply those criteria to the ngt forecasts that we have produces and that shows that for no time is crowding in the max criteria. In no time is it in the very crowded criteria. At most 1% of passenger hours is crowding and busy in 2%. There is not a crowding problem associated with ngt.

Qc – so crowding should only be sig if effect on passenger behaviour... so here mr hanson has said it is not a specific objective of the scheme and also is it likely to have sig effect on passenger behaviour?

Nc – no

Qc – nwltf 118, 2.4.7, bonsall says that there is no attempt to rebut his suggestion that the exclusion of older people from the sample selected from stated pref work – intend to reduce the size of no seating penalty

Nc – we don't accept the anaylsis that there is a crowding problem associated with ngt. We take it that older ppl are ppl who can use concessionary scheme – mr Henkel set out that ngt will be available to those ppl on the same terms. Also free travel is only available after 9.30 and there is no crowding issue in the off peak period after 9.30. Though there may be issues in evening peak. also to a degree, people travelling on the ncts passes tend to have greater flexibility in their journeys to avoid travelling in those busy periods. Finally there is a technical reason – stated pref is capturing the willingness to pay. It is very hard to capture if those people travel for free.

Qc – nwltf 118 – he says he doesn't want inquiry to lose sight of the fact that it is generally accepted that multiple phase on stated pref data tend to favour prediction of mode shift. your stated pref research for leeds...your view on whether it is likely to over predict mode shift?

Nc – all models are subject to a degree of tolerance – due to a whole combination of factors.

Qc – 2.11.3 nwltf 118 – bonsal argues that the generalised cost equation ignores aspects such as the hassle factor of having to begin journey by selecting between two modes – do you accept that criticism

Nc – no, the models represent people's average choices – it is a probabilistic model. It is the aggregation of average choices. Those models capture the way that people make those choices. There is a general point that every city you go to ppl have to make travel choices. E.g. London, go on bus/tube/cable car/boat etc. all the time people are making these choices on which system works best for them. I don't see why ppl from leeds would be any different from anywhere else.

Qc – 2.16.3 nwltf 118 – here bonsall is responding to 2.9.2. to your rebuttal of his evidence – whether the extent of variation in public transport journey time should include walking time. He deduces that you did not understand the point that he was seeking to make. He says Because you have omitted the invariant walking time, his estimates of variability is inflated and have an over prediction of punctuality benefit.

Nc – I do understand his point – my understanding is that the variability of a door to door – there is a different distribution in the variability than if you look at a stop to stop variability.?? 11:13

Maybe he hasn't understood our response. We have valued the varying journey times by 1) considering its consistent to guidance that dft gives us 2) it is internally consistent – we apply a

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reduction in the variability of stop to stop time and the valuation of it to derive a benefit. if we were to go down the suggested approach of bonsall we would have a different valuation of the variability from door to door than stop to stop journey time – a different factor would apply to that...but I don't see how that would produce a diff level of benefit. the approach that we have taken, we have discussed it to dft and they approved it – not just the economic appraisal but much wider than that... they have accepted the valuation we have done and like quality factors they have made no adjustment to the bcr in relation to journey time variability. And also it is consistent to the guidance the dft give when they look at variation of journey time from stop to stop, not that of door to door.

Qc – promoters rebuttal page 4 table 2.3 – you can see it reproduces an updated table. You deal with this at 2.4.3 plus journey times. does the updated table produced by hanson make any material different to any work you've done on business case

Nc – no

Qc – we have a fwy 120 doc, the paper that was described by mr jones as the locus classicus – he was interested in interchange and distances etc. is this doc regarded by those in the profession as the locus classicus on this subject and refer to up to date interchange guidance

Nc – no, I took time to discuss this with colleagues who write interchange guidance-

Gj – [interjects] – this has been doc put in weeks and weeks ago etc.

Nc – as I was saying I have discussed this with colleagues who wrote the interchange guidance for crossrail scheme and also similar work internationally in Vancouver/british Columbia. As far as they are aware it is not refereed to tfl interchange guidance as applied to the capital. They have also not found it in the Arup Dublin interchange guidance. Also in Australia we haven't found anywhere where it is applied.

Qc - the decision letter and inspectors report for the Merseyside project – your views on that... fwy 100 and fwy 101. Cost benefit analysis in inspectors report, 4.7.7, page 97 [reads out inspectors report]. In this case, in c-1 how do you assess the likely impact on bus operators?

Nc – we have, set out in table 21.3 of c-1 page 21-5, the appraisal was taken pre-webtag guidance. The design of the appraisal, the TE table in particular, makes that consideration explicit. We have now actually taken this into account. ??11:26

QC – the inspector asked Robertson about why the highways improvement at lawnswood area not be introduced without ngt?

Nc – well they can be introduced without ngt but to do so they schemes would have to effectively compete for funding with all other schemes put forward across west Yorkshire because now funding decisions are devolved. They would have to be subject to locally applied prioritisation criteria. If there are well performing schemes and money available there is no reason why such schemes can't come forward without ngt.

[11:28]

BREAK

[11:44]

Inspector – we have found Prof. Todd's appendices.

CROSS-EXAMINATION OF CHADWICK BY PROF BONSALL

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Pb – how long have sdg been involved with this project and supertram before that?

Nc – with ngt, involvement started in 2005 by providing technical support to metro as counterparty to Atkins. It has continued uninterrupted form then. With supertram, there were a number of schemes that led to development of supertram proposals – so before I joined the company around 1998.

Pb – how many no. of years has your company been involved?

Nc – I couldn't make an estimate

Pb – a crucial impact is your estimate of quality factors – I want to make sure the use of vehicle quality factor is understood. You've advised that vehicle quality penalties have been applied – if we take the trolleybus as ref point, you are advising that any other public transport should be assumed to attract a quality penalty of 2.2 to 5.8 min per journey.

Nc – you are taking figures from our response to you app 103 –

Pb – yes, the use of nba vehicle would attract penalty of half that amount?

Nc- doc c-1 assumes quality factor eqv to standard bus but subsequently in evidence we set up two further tests – one where quality factor is half and one where it is equal to that applied to the trolley vehicles.

Pb – so to the basic next best alternative (NBA) – which appears in c-1 , the penalty factor is the same as the bus? any use of public transport also attracts additional penalties depending what is not available at boarding point?

Nc – the model is not very good at dealing with negative numbers – we create a positive no. as a penalty – we then work down to that towards lower value...

Pb – value of penalty is 5.8 min lower for ngt than normal bus stop.

Nc – yes that's what is says

Pb – so a trip by bus from average bus stop there will be a penalty of 5.5 min as it's a bus and 5.8 min due to the bus stop so total penalty of 11.3 min – these values was from stated pref work by sdg

Nc – yes

Pb – so 3.2? of your proof - you mentioned use of stated pref techniques. Mr Cameron got you to say you've described that process – but I don't think you have. You took us to doc c.2.4 which describes the use of the results of the stated pref measures but you haven't described the methods of it anywhere

Nc – I don't understand your question

Pb – mr Henkel said that mr chadwick will describe what stated pref is – a sophisticated way of looking at opinions. We haven't been given the method/description of what it is/how it's been done

Nc – so what would you like me to do

Pb – have I missed it anywhere?

Nc – I would say that the stated pref report to which we refer, in that report there is an overview of stated pref – fair enough to say there isn't detail of history of the application of the stated pref...

Inspector – we can move on... established

Pb – basic idea of stated pref and willingness to pay – so basic idea is to get ppl to reveal their willingness to pay for particular attributes of a transport mode by asking them to choose between a series of bundles of attributes and if one of those attributes are priced then choices are analysed.

Nc- yes

Pb – can we turn to doc c-4-24 – description of your stated pref work. on page 19 figure 4.7, what we've got here is an A and B and the A is a bus with ticket sold by driver, 10 min service etc... costing a £1 and B is a trolleybus, service every 5 min and shorter journey and £1.45 – you asked ppl to choose what they would prefer.

Nc – that's right ppl trade off different attributes

Pb – it's a controversial technique but very useful...

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Nc – I agree that it is useful but you have to explain what you mean by controversial

Pb – ppl who give inflated values ...

Nc – well yes but there are ppl who criticise many parts of our modelling suite

Pb – it's particularly useful though when we compare options that we observe in reality

Nc- yes

Pb – but important to ensure that it is used with great care

Nc – yes

Pb – that it is a true reflection of real preferences and not a result of spurious or unwanted effect

Nc – in principle I agree

Pb – you said that there was no reason to believe stated pref would over predict mode shift

Nc – no reason to agree inherently...

Pb – now you've slightly nuanced what you said in the examination in chief but you are saying its ok if you do it properly

Nc – that principle is applicable to all elements of the transport modelling suite we have used.

Pb – well stated pref has been given more normal criticism

Pb – para 2.10 of your stated pref report – please read it out

Nc – [reads out]

Pb – you have got a reference to 'biased result' from hypothetical nature of stated pref – and the way you get around that/correct that is by rescaling the model based on info you got based on the revealed behaviour – did you do that in this case?

Nc – there are multiple cases here – need to take you through each in turn. The sp set out in this report was first applied in the 2009 major scheme business case which the modelling suite was different from the one we are employing currently using LTM. At that stage there was a choice model developed using stated pref data – the process of making sure that model was accurate ... in effect it was rescaled. The calibration – the stated pref parameters were rescaled in accordance to revealed pref data. Then exercise was deployed in the LTM – which in itself has a hierarchal choice structure... the rescaling was the choice of the appropriate parameter in the mode choice model...

Pb – you are referring to the choice between car and public transport

Nc – the LTM makes a choice between car and public transport at a trip-end level before going through distribution. And then once public transport major scheme has been created, there is a further choice model between bus and ngt...that too as a scaling parameter associated with it

Pb – how can that have a scaling model if it's based on a choice you can't observe

Nc – that is derived by mr hanson's team – that parameter was chosen so that it is consistent with all the others – there has to be a hierarchy that needs to increase the value – so the parameter was derived to make sure it was consistent with the other parameters. There is an element of judgement applied to that relating to consistency from the hierarchal model overall. The process was made similar to be consistent with the

Pb – you have no scale for RP data for the bus...the scaling parameter has nothing to do with RP data.

Nc – isn't that a very similar thing – the distribution of area in the stated pref is different from that from the LTM...

Pb – so you have not done any scaling to correct the bias which results from the hypothetical nature of the sp choice modelling.

Nc – it has been rescaled ...but you are literally correct to say that parameter has not been derived from that revealed pref. data. But subsequently when we transferred the modelling platform we needed to make it as best we can – so we had to scale that...

Pb I think by doing that you have created a monster

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Pb – figure 19 stated pref report – this is figure that will enable us to explore ppl’s pref of trolleybus versus bus. if ppl had a preference for trolleybus this exercise with its variants would have revealed that...is that correct?

Nc – yes... they would select journey b

Pb – no, by analysing the data from this exercise...you would be able to discover ppl’s pref for a trolleybus

Nc- yes we could do that...in fact we did do that

Pb – what result did you get?

Nc - no. that doesn’t appear in the report

Pb – I know it doesn’t

Nc – para 7.4.6 on page 53 – it says why it doesn’t appear in the report

pb – read out please

nc – [reads out]

pb- that’s a spurious argument isn’t it.... You had no real values specific to ngt...e.g. noise values etc. I’m suggesting that your argument that models including trolley did not perform –is a [???] 12:10]

nc- I’m not saying there’s no value – but the statistical fit that excluded those constants was stat better than those including them. Probably better to include some context.

Inspector – yes

Nc – at the time this work was undertaken in 200 (before major scheme business case submitted) whilst at that stage the promoters had an emerging preference for trolley vehicle tech they hadn’t settled that – it was only in 2009 when submitting the business case was the choice made for trolley vehicle. Clearly as you get closer to submission the choice gets more certain – and only after submission is that intent signalled to the dft and then approved by dft. We were asked to try and unpack the elements of quality associated with the constant. This is why there was explicit consideration of elements associated with the stop and those associated with the vehicle. That wrapping into a single constant wasn’t what we wanted to do. That is mirrored in terms of the soft factors found in Aecom report. It was a deliberate decision not to wrap everything up in a constant... we saw it as a benefit.

Pb – I’m sure you did given the value you found was so small.

Nc – what value was small?

Pb – the preference you found for trolleybus

Nc – I said the statistical fit of the models that were fitted without the specific constant was better overall than those that weren’t fit... [???]12:15 it was not based on the value of the parameters but the overall statistical fit of the parameters we looked at – we didn’t pick the ones with the size of the parameters but the ones with the best stat. fit. Multiple models are fitted – it’s not the case of either or. It’s running into 20-30 models fitted. Not all the models fitted were detailed in this report

Pb –we have no result in this report that shows us the people’s pref or aversion to travelling on the trolleybus

Nc – if you consider that a model where the only parameters involved was quantified variables (not qualified) then yes – it’s not in the report.

Pb – there is no value in this report to tell us ppl’s pref for or aversion to a trolleybus

Nc – I just agreed with that

Pb – your argument about the attributes was considered in the work mentioned before by Johnson etc. when they were doing work for UK tram. They said that your argument was rather dubious and that it doesn’t hold because it didn’t have attributes specific to vehicle type

Nc – it’s worth saying who UK tram is – it is an organisation which is a joint public sector industry body established to make promoting tram schemes easier. What was observed by promoters...a lot of work is repeated... and that there is an opportunity to share standards with promoters... a lot was from working with transport industry and most work focussed on technical standards. There was a piece of work that led to work by mark waldman and dun Johnson[?]. SDG specified that work – I

wrote the brief on behalf of UK tram ... and commented on the report so I am familiar with it. I haven't read it since 2009. But like all good reports, the authors are welcome to their opinion – you don't have to show me what it says?

Pb – I think we're going to have to put this doc in as you are aware and specified it.

Nc – I haven't looked at it in 4-5 years... you are reading a quote out...

Ins – it must be submitted... it will be awkward now

Cameron – he needs to be given it in advance...

Pb – let me say that...if you specified it then it must have been a bit embarrassing that one comment was that it said that this was a rather dubious claim (in para 7.4.6)

Nc – but I need to see the context of the quote.

Pb – it is rather dubious – you didn't have any specific attributes did you

Nc – I've explained the approach...

Pb – and you didn't have any vehicle specific attributes – just confirm it

Nc – you need to explain your question

Pb – there are lots of different attributes – generic ones like journey time/frequency/cctv aboard... and specific ones

Nc – yes, I understand and you are correct

Pb – there was non-specific – except the picture of the trolleybus/bus/tram etc.

Nc – there is a good reason for that as the promoters were trying to unpack the attributes...

Pb – if you were asked to do some work to allow them to unpack these attributes its odd you didn't include any of these specific attributes – so the only thing comes from this constant...everything else is generic.

Nc – yes

Pb – there is no number in the report that tells us the aversion to this scheme

Nc – we've been quite open about that...the way we have described the vehicle attribute – we have said the quality factor associated with the trolley vehicles...??12:24]

I think we've gone a long way around to say something that is quite clear in our report

Pb – not sure it was clear to anybody who took at face value your preference for trolleybus was based on the stated pref report... as it wasn't

Ins – I think we've established that... if you could

Pb – were your parameters which you used and gave to mr hanson to represent preference for trolley vehicles – was that based on stated pref research in respect of ppl's pref for trolley

Nc – is it informed, absolutely, is there a parameter, then no.

Pb – mr chadwick ought to reveal the size of the parameters which you did find for preference or aversion to the trolleybus – it would be useful to see what the stated pref did include. Can you produce that no.?

Nc – no – not while I'm on the stand

Ins – is that available...

Nc – I don't know...need to go back through the files so see if it was. And to be honest, even if it were I don't agree that it would be useful. We've set out the parameters we've used – and as I've proved I've established how we've discussed those with the dft and gave their satisfaction that those parameters are appropriate to apply.

Pb – you have come to the inquiry to tell us that you recommend a parameter that indicates pref for trolleybus – now we asked you questions and say that actually it wasn't based on that...and you can't remember where these are...

Ins – are you willing to produce that or not

Nc – willing is one thing but able is another

Ins – so anyway...at this stage that's a note sometime in the future...

Gj – it's not for a witness to decide whether it is beneficial or not – so we would like it provided in good time

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Ins – we have to ascertain whether it can be done and if it can, how long it would take to do it and when it would be able to be done.

Cameron – we will be able to look into that after chadwick has finished given the evidence... on the question of whether it will assist the inquiry...it's for you to decide sir, but he can give his opinion.

[12:30]

Pb – look at appendix A of the stated pref report – graphics used to represent different attributes of vehicles/stops etc.

Nc – yes

Pb – the bottom of page and over next page can see the various vehicle types – can we then turn to table 7.4 and I think this table summarises the willingness to pay which you deduced from experiment you've done

Nc – yes derived from table 7.3

Pb – we can see some willingness to pay for change in bus type from old to very new – we get a value of 13.39 as a willingness to pay for a very new compared to old bus and if we go one line further down a willingness to pay 10.01 pence to travel on a FTR like vehicle compared to old bus.

Nc – yes

Pb – can you confirm these are same no. that appear in table 2 of c-2-4 the report you took us to. At the top of page 4 you say the values are converted to minutes by dividing pence per minutes...can you confirm that that's how you derive the penalties in table 1

Nc – yes

Pb – that's where the values which you gave mr hanson came from

Nc - yes

Pb- so the value you suggested he should use to represent pref for trolleybus was based on the difference between an old bus and a v. new bus – nothing to do with a trolley bus

Nc – correct

Pb – why did you choose to use the very new bus as basis for trolleybus parameter?

Nc – we chose that because our opinion is that the increment in quality between an old bus and a v new bus and then comparing that to the increment between buses currently operating and trolley vehicle - the trolley would be able to deliver at least that if not greater increment so we were content to recommend that parameter be applied through LTM.

Pb – are you saying that because the proposed ngt is intended to be better than current bus...that it will be

Nc – it is intended to deliver those quality attributes... it's not a self-fulfilling prophecy but a view based on the improvements that can be achieved through an electric vehicle.

Pb – so it's an aspiration then – since the promoters want the trolley to be preferred to a bus...

Nc – no, you are saying that I just responded to what the promoters wanted but that is not what happened. We applied our professional opinion as to what parameters to apply to this

Pb – I think you are saying that the trolley bus will be designed to be better than the bus and therefore it will be perceived that it will be much better than the bus

N c- we are saying that modern service will be better than current bus...

Pb – you are saying it will be perceived as much better than the bus

Nc – yes

Pb – and ppl would be prepared to pay the same to travel on a trolley bus as they would be prepared to pay for a very new bus...

Nc – there is a parameter which is the willingness to pay for v new bus compared to old bus and for the purposes of modelling, the willingness to pay for trolleybus is compared to that of the current buses operating now.

Pb – so you will apply this parameter to the difference between an existing bus and a future ngt vehicle and you are saying that that is how ppl will perceive this bus

Nc – to be at least that good

Pb – for purposes of modelling but also for purposes of the business case- all the revenue forecast, everything, is based on the assumption that ppl will perceive the trolley as better than the willingness of ppl to pay for a new bus as compared to an old bus.

Nc – it's just one of many parameters that influence that... it's not ALL down to this parameter...that produces the forecast etc...

Pb – no but all the values from the business case are influenced by this assumption

Nc – yes, and I would go on to say that we've had the same discussion with you that we had with the dft...we've made it very clear. That's what c-2-4 is about...summarising our discussions with them and they accepted those parameters.

Pb – so what you are saying is that c-2-4 justifies the use of the parameters but what I demonstrated is that it is not until you look at c-2-24 that you understand what is going on... you chose not to use the stated pref value for trolleybus

Nc – I gave them all these documents... it's not as if this is a big long technical report that hasn't been trawled over by the dft – when we went to the LTM and produced the programmed entry business case it was also trawled over...it's not a set of assumptions that have been unchallenged through this process

Pb – do you want to produce any doc that has any comment about doc c-4-24...

Nc – I don't know whether this doc exists

Pb – but you produce c.2.4 as doc for discussion with dft... but that doesn't actually tell us what happened

Nc - whatever internal consideration that dft might have you have to ask them that... but I reiterate that we take it that they have awarded this scheme programme entry – and when they did make adjustment to cost benefit ratio none of these were as a result of the quality parameters. The ppl we were engaged with in both the business cases are the same ppl. They asked detailed technical questions and so I think we made them fully aware of it

Ins – so is there anything that spells out to dft that this old to very new bus comparison was what you used as a basis of the preference for ngf?

Nc – I have to re-read c-2-4 but my opinion is that in that discussion leading up to 2012 business case, they were aware.

Pb – were they aware that you had produced these values...which you said were unequivocally people's pref to trolleybus...were they aware of that?

Nc – I wasn't present in some meetings so I can't tell you. my recollection of the detailed discussion of the tech report 5 years ago ... it's not clear to say whether this topic was covered

Pb – you chose for comparison a vehicle changing from old to very new bus – one that looks like a double decker bus. you also had a value for FTR – why didn't you use that as your comparison

Nc – we take the view that the increment in quality that happens between an old bus and v new bus will be reproduced between a current bus in leeds and the ngf.

Pb – so we are back to the aspiration

Nc – I'm saying we observe this as actually happening with electric vehicles.

Ins – are ppl going to be led to believe these are what is going to be happening?

Nc – all ppl we surveyed were bus users so they will have experience that there were quite a lot of old buses in 2008 in leeds. So the purposes of the pics were to show what an old bus is like...but it is not a literal picture of what an old bus or the new bus is like. This is exactly why we use these pictograms rather than photographs.

Ins – how do you decide what sort of graphics to use then...why not use an articulated or single decker bus. who makes the decision as to what graphics are used? And how does that influence someone's opinion? I want to know really how you make decision on graphics.

Nc – as explained a moment ago – a first step is to undertake a series of focus groups to talk about bus travel experience and we ask what variables they regard as important. Inevitably there are variables we'd like to explore which are very difficult (e.g. noise/heat from engine) but actually in

computer based experiment this is difficult to compare. The next thing is how to represent that – one way is that we learn from experience (this is not only time this has been done, these exercises done enough that there is a body of experience developed), and I've also mentioned the report done by tfl using pictograms rather than photographs. The next thing is that we do a pilot exercise – the principle purpose is to make sure the survey is working correctly. - technically, and to check if people understand it. The second part in your question was how the choice of articulated or single decker or double was used...there are more parameters we would like to explore but would load the respondent and therefore make it useless. We have to make a judgement – the double decker is a judgement we feel that in this particular context, is more likely to be double than single decker...
Ins – that's explained in a lot more detail...

Pb – second graphic down on appendix A is new bus FTR – that bears a passing resemblance to a trolley.

Nc – what are the purposes of these pics? It's not to say these are what we are planning, but to get ppl to anchor in their minds

Pb – the preference you've got is based on what these pictures would conjure up in their mind

Nc –yes... often there is an introductory screen with a pic...

Pb – what the intro said was that the new bus has advanced tech like FTR.

Nc – [explains how a computer survey works] – I can't remember what it's like

Pb – they expressed a greater preference for v new bus than one that looks like FTR. The main differences between them in the double decker and it not being articulated...

Nc – it is telling us that ppl prefers attributes of new to old bus

Pb – but A is better than B... they were also telling you they preferred the v new bus to the new bus with advanced tech like FTR

Nc – that's correct

Pb – that's another finding from your survey

Nc – that's explicit in the research and we acknowledge that in your doc

Pb – but it seems you didn't give it to mr hanson in your doc

Nc – yes and I explained why

[13:00]

Pb – just to summarise, did you use the value for trolleybus derived from exercise 7

Nc – no

Pb – did you use the value for most trolleybus like vehicle, FTR, tested by exercise 2

Nc – I don't accept that it is most trolley like, there is a trolleybus option

Pb – ok the one that looked most like the trolley bus in exercise 2 where trolleybus not an option

Nc – we used the value of v new bus and old bus...

Pb – you didn't use the value for the most trolleybus looking like value but you did use it for double decker

Nc – yes

Pb – would you agree that the most trolleybus looking like option values were lower than the v new bus option

Nc – yes

Pb – you gave mr hanson the values from the v new bus preference and if you had given the FTR values his models would have predicted a lower value for ngt

Nc – yes

Pb – and if the trolleybus values were used then it would be lower still

Nc – well we haven't established what the value was...

Pb – well that's why we are asking for it

Pb – did you realise that mr hanson was applying penalty factor to train and bus trips. The penalty factor is applied to all public transport vehicles that aren't ngt?

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Nc – I do recall and I was aware of that

Pb – are you happy that quality penalty was used that way

Nc – no...but didn't make a difference in this case. What is important is the rail cost between do min and do something...we are not actually changing the rail so no sig difference to the forecast

Pb – but your aspiration that trolley be perceived better than the bus... you are also making the same assumption to make the trolley be perceived better than the train. You would have difficulty explaining to dft on that one

Nc – I would have to go back to look at mr hanson's report before I can comment on that...

Pb – you choose a report but I am saying I think your use of this value implies the trolleybus is perceived as being higher quality than the train

Nc – I can't say it without going back

Pb – please look at lunch time

[13:06]

LUNCH

[14:10]

Pb - Uk tram report commissioned by mr chadwick – he said he'd like to refresh his memory of the precise wording. I will let him have time to read it so won't ask him questions until tomorrow. Nwl-119.

Nc – I am happy to be asked questions on it tomorrow on basis of what I am able to read overnight.

Cameron – if there are to be any other docs ... can I have confirmation there aren't going to be anymore.

Gj – that is my current position. I am not anticipating introducing a new doc before my cross examination.

[14:17]

Pb – c-2-4 the ngt quality factors report. Top of page 4, willingness to pay values are divided by a value of time to produce a penalty factor which is used for modelling. Its saying that the base value uses plenty of seating space...

Nc – correct

Pb – you had values for three levels of crowding. Table 2 of c-2-4 shows those three levels. Remind yourself of the pictograms in c-2-24... the second page of the appendix A. You see three different levels of crowding in those pictures at the bottom of the page. When there is plenty of seating space – that has the lowest of values. You agree that because we have used the lowest value of time that gives us the highest penalty value

Nc – yes that's a consequence of the division

Pb – if we look at those graphics in appendix A, why did you choose to use the one for plenty of seating space rather than for the middle one?

Nc – we chose it as that was the one we felt was appropriate for the planning of a RTS such as ngt – the starting assumption should be that.

Pb – what do you mean...for planning?

Nc – we undertake a forecast to set out...the way a forecasting process works is that you postulate a service frequency and as we are planning the system we can look at volume to capacity ratio – if we feel excess capacity or insufficient capacity is provided then we can review the planning... for planning that is what we consider the appropriate solution

Pb – having now looked at those results...are you happy to use it for forecasting and business case

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Nc – yes the analysis at 108 is showing that for most of the route those are the conditions that prevail. The second reason why I'm content is that as we reported in the rebuttal to nwltf we haven't taken a sensitivity test where we have used a higher [??] that shows the quantified part is robust for the assumption.

Pb - you referred to app108 where you suggested three possible internal layouts / ratios of seating to standing for ngt. You were present when I took hanson through it... shows the need to adopt ng3 – the max capacity version

Nc – I don't agree...these are decisions for the promoters to take when they specify the vehicle.. as they move to the condition approval stage... they can choose a greater no. of seats on the basis that for the vast majority of the day...or max standing. I don't accept that this analysis says we have to adopt ng3.

Pb – do you agree to avoid invalidating mr hanson's forecast we have to assume a sufficient space to carry the forecasted amount

Nc – no, I say this because this analysis shows that the only time there is any possibility that the ngt vehicles will have a loading which is at or projected to be in excess of capacity is a very short time in morning peak of 12-24 minutes. I don't accept that would invalidate the entire forecast.

Pb – you accept that if you hadn't got sufficient capacity people would have to wait for 9 instead of 3 minutes.

Nc – depends – we have allowed for provision of additional services...the assumption is that those might not be evenly spread along the hour...so there is a possibility that if you are standing at the bus stop at the right time, your waiting time would decrease

Ins – would it be 3 minutes between the ngts rather than 6 minutes or would this extra service be more evenly distributed in the hour

Nc – it hasn't been decided but my opinion on how it could work is that the even spacing of 6 minutes would remain and the peak extra services inserted into it. It may be they are not accorded full priority... however that is a technical issue where you have to talk to mr Robertson...

Pb – mr Robertson would say that if you try to put in more than one priority event every 6 minutes the priority would deteriorate...whatever you do to increase frequency will decrease priority.

Nc – I didn't hear all of mr robertson's evidence...but there is probably a journey time effect. If we use what you said...the journey time would increase a few seconds but there would probably be a reduction in wait time etc...

Pb – ok so let's say it's peak time around 5pm...where do you put this extra 11th vehicle?

Nc – it won't be decided until you are very close to operating the system but targeted to have the greatest effect. For the purposes of the business case...we simply say that the vehicle will run from one end to the other... in practice the deployment would be tied to where there would be greatest effect. There are turn-back provisions on the ngt route and there will be one in headingley and in the south...and ability to turn back in the park and rides. What I would envisage is the provision of that extra facility will be targeted where there would be most effect e.g. short running during that period.

Pb - point I'm making is that it can't be everywhere at once. Whatever decision is made...there will be some ppl left waiting

Nc – clearly... but we don't know that

Pb – after 5pm there are lots of ppl coming out of their work places

Nc – if we take a 12 minute period there will be 2 services and if we target there will be 3 services and therefore 50% extra capacity but you're right in it not being everywhere at once. There could be some ppl that could be left behind but you can't say there will be

Pb – even if you don't take the busiest ngt stop and even you don't take the highest forecast made...you still have more ppl wanting to take on ngt services than there is space available on those services. I accept that you might be able to solve problems at particular ngt stops but you can't solve it everywhere

Nc – analysis supports provision that there will be sufficient capacity provided during the peak times. I accept this is an average...and average conditions might not be the same every day... so there could be possibility that at certain times of the year that is possible. I don't think that you can definitely say that will happen. The other thing is that the ngt service is designed to be specified to allow it to be punctual...so ppl can have confidence in the time the ngt vehicle will arrive at stops – and in that every other well loaded system some ppl can adjust times to their journey to avoid that.

Pb – sorry did you say that some ppl will voluntarily change their time of travel to avoid busiest period

Nc – we know that happens

Pb – let's record that...

Nc – we know that some ppl will change the time of their journeys to avoid the busiest period

Ins- has this been modelled in your business case

Nc – no

Ins – how is that reflected

Nc- it isn't. its observation of what does happen with public transport systems.

Ins – have you got evidence

Nc – no I can't cite a report but anyone working the public transport field would say it is self-evident

Pb – we are talking about overcrowded ngt vehicles. Chadwick saying it doesn't have to have the biggest vehicle and some ppl would voluntarily change the time they travel in order to avoid ngt

Nc – I'm not saying that. You said that you don't need to have the biggest vehicle. The choice on vehicle size and different between internal lay-out is a wider choice than what happens in that peak period. You were completing two things together that were separate.

Pb – ok, what you are saying that because ppl will voluntarily change time they travel to avoid overcrowded ngt, that means you don't have to look at that problem of crowding to such a degree? You can allow for this when you are deciding when and where to deploy the 11th vehicle

Nc – I am saying that when the decision is made to deploy the 11th vehicle you have to take into account all the factors in the round...including the observed behaviour of ppl changing times of their journey.

Pb – you are saying it is impossible to take a view as to whether it is ngt1, 2 or 3.

Nc – you can take a view, but it is only a view and depends on what criteria you want to deploy. The promoters have not yet set out the detailed criteria determining the choice between seating and standing capacity. That will happen when we go to talk to manufacturers.

Pb – I'm asking which version, ngt 1,2 or 3 does the modelling relate to. I agree you can't know which it will be...but which one have you used for modelling?

Nc – modelling is independent of this assumption – there is no capacity restraint employed with ngt or bus.

Pb – you've assumed a new ngt 4 then...which has infinite capacity

Nc – in terms of LTM that is literally true but it is not true in the way that the business case is constructed. We look at the output of LTM and volume capacity ratio...and take a decision as to whether the frequency is appropriate – it is looking at that that we are looking at extra vehicles in peak periods

Pb – that's not an answer... the assumption is made that the capacity is infinite and therefore no crowding. You assume that everyone can get on board and therefore no one has to wait for 9 minutes. That is what the business case is made on

Nc – that is what the benefits are based on but not the cost.

Pb – so the revenues/loading etc. is based on the assumption of infinite capacity... that's all I wanted to establish

Pb – you are happy that the crowding level can be assumed that nobody ever has to stand?

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Nc - app 108 says in the table on the first page is the potential of not having a seat available – which effectively is standing.

Pb – but in the values you've used in benefits of the case...you've assumed no one is standing

Nc – correct

Pb – you were very anxious we should look at this test on whether there is seating space is available. What this test is showing is that if you assume with your parameter values that everyone stands, this reduces your loading by about 4%.

Nc – is it worth taking the inquiry to the doc...

Pb – is it in rebuttal 2 of 1719.

Nc – I think the impact on demand...might be at para 2.11 and table below that on page 7.

Pb – that is showing that one of the reasons that mr chadwick thinks is not a serious issues...if he makes the assumption that everyone has to stand...it only reduces the demand by 4.2%. Is that right?

Nc – I have to re-read the text but I suspect that...

Pb – mr Cameron took you through it.

Nc – the values from the stated pref work is not a value where everyone has to stand only where some ppl are standing...

Pb - ...that is not an accurate description of the test you ran...

Ins – I was led to believe the test was made with everyone standing... rather than everyone standing would have to if they weren't sitting in the available seats

Pb – answer is in para 2.11 in page 9 – it says it unequivocally.

Nc – reading that again I don't feel it's the best description. I prefer the description I just gave u – it's a value of time where all the seats are occupied and sig no of ppl are standing

Pb – this is one of several examples where things are described and when looked again...they are changed...

Ins – you don't seem v certain in this. Are you sure that that is the case...or do you need to double check that

Pb – ok

Gj – his preferred description now is that all seated with a sig no. of people standing but unspecified.

Pb – we might be able to clear it up when we look at graphics at bottom of appendix A

Ins – sorry, if it's to do with seating then we need to know how many seats are allowed for then – and you say no decision has been made

Pb – can we turn to appendix A of c-4-24 and look at graphics at bottom of page 2 – what I assume you did was that you used the middle graphic ... that looks closest to what I said

Nc – I would have to confirm but in my view right now it is the top graphic.

Pb – I need you to know what amount of crowding is used... as my further questions deal with this [discussion on how they can clarify – Cameron will see if he can take instruction on that]

Pb – looking at the boarding stop penalties now – the values derived from your stat pref surveys – can you confirm the component values can be found in table 1 of c-2-4.

Nc – yes

Pb – the poor lighting penalty was applied to all stops with poor lighting?

Nc – the poor lighting parameter was applied to the stops with poor lighting in the way set out in c-2-4 which includes the packaging effect. So the value that would be actually applied to an individual stop would not necessarily be that value –

Pb – I understand that...it was a capping process so that it doesn't just simply add them all up

Nc – so yes I am saying that yes that was applied but not literally

Pb – can you confirm the average bus stop has poorer lighting than average ngt stop in the morning

Nc – the lighting for each ngt is assumed to be the same and good...I suspect that the average lighting penalty for a bus stop would be higher than the ngt stop but each one is looked at

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individually to come up with parameters... just knowing the route we are looking at I suspect there will be greater no. of bus stops with poor lighting

Pb – you know it...it's not a question of you assuming it?

pb – you said...ngt has 0 penalty but some of bus stops have a penalty therefore average bus stop has higher penalty as average has a penalty of 0

Nc – yes that's fair

Ins –.... Is there any problem with having that lighting at ngt stops

Nc – my understanding is that taken account in environmental analysis

Ins – some objectors objected on grounds of light pollution – but it hasn't been taken into account in the penalty analysis ... problems with light pollution

Pb -10.59 penalty value is about 10 times higher than the value that Aecom produced in their review for dft g-4-13. They found a value of 4 pence... somewhere in the report.

Nc - I am not familiar with the Aecom review as a whole. As I understand it the values we have put in on page 8 of c.2.4 are the values that also appear in web tag and there is no value there for lighting.

Pb – we'll have to come back to all that...

Ins – I'm happy to sort these out if we have a 15 min break right now

[15:06]

BREAK

[15:20]

Ins – mr Cameron have you had any luck with the info

cameron – the essence of the info I've been given is that what mr chadwick says was broadly right in that the sensitivity test referred to in rebuttal to mr bonsall at 2.11 and 2.56 did not assume that everybody was standing – it assumed that those who could sit were sitting and others were standing. 2.11 has not set out the position correctly if I am right. That looks as though that was mr hanson's contribution. I would like to get some more detail on this and get paper to verify it but that's as far as I can confirm it right now.

Nc – I re-read para 2.11 and 2.56 and I am happy that the last two sentence of para 2.56 is in essence what is was but in 2.11 it says the quality factors used in this test that it assumes all passengers will have to stand... you have to change only one word...from 'all' to 'some'. I am being also incredibly pedantic but it's not a quality factor but a value of time.

Pb – I wanted to know which of the levels of crowding shown in appendix A that test was using?

Cameron – that is a question I'd like to satisfy myself as an answer...

Ins – so we don't know at the moment...

Nc – I didn't know before the break – there's not info I have at hand to confirm one way or the other.

Cameron – we have to get to mr hanson's team to find out precisely what went in.

Ins – ok overnight it might be clarified

Pb – I found what I was looking for in g-4-13, turn for example to page 179, we would find a result on this table 3.10 by cohen that if moving from bus stop with no shelter lighting to one that was reasonably lit...he found that that value was around 4 pence – that is less than one minute.

Nc – these values are from London. So in fact as it says from the previous page the – these are post-packaged values... the approach we have taken is to take it directly from stated pref and then package it. The business case developers' manual works that the values are pro-rated downwards...these are not comparable numbers...adjusted from the research that stands behind it...

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In some respects I would suggest that this is a misleading comparison because the London values are more expensive in terms of their scope. Consequently they get factored down...so you can't compare them like that.

Pb – try table 3.9 - monetary values – lighting at bus stop – says 3.1 pence value.

Nc - This is again London work...'adapted from' London packaging values.

Pb – would you say these values are indicative of lower values than yours?

Nc – literally, yes but i go back to my point in that these values are developed and applied in differently ways... so it is wrong to compare them like that.

Ins – why are these produced then if these won't be used?

Nc – they are used. These values are produced for tfl buses/underground.

Ins – so what was this doc used for – this is a final report of the soft measures in UK... is that a general report...

Nc –it's a report commissioned by dft – to help it ultimately derive a set of values for quality factors which has now been incorporated in the web tag guidance. Its lengthy but the report did broadly undertake an extensively literature review of work undertaken up to that point so the appendix to which we were looking at e.g. 3.9-10... is from that literature review...

My understanding is that these are values that already account for the 'package' effect and they have been reduced...

Pb – I was going to compare it to your reduced value...

Nc – but then the comparison is not the individual elements of the package but the whole.

Pb – I think tomorrow morning we can return to whether your values are large or small.

Nc – so look at the UK tram report overnight.

Pb – we'll move on

Pb – turn to para 2.33 of c-4-24 original stated pref report. You read that para, it is about the use of graphics. It says 'experience shows ways respondents interpret drawings may differ from what is intended by the designing of the survey' – can we turn to appendix A of that doc and look at the graphics used to derive poor lighting. This is on page 1 of appendix A. it's the second pair of graphics... looking at those graphics, are you the man to ask. What comes into your mind as you look at them?

Nc – it's that there is a poorly lit and a very well lit stop - and quite deliberately making choices as extreme as possible.

Pb – what else have you done to maximise the value of the parameter?

Nc – I don't have anything in mind...

Pb – I suggest to you that it looks as if its night time

Nc – people travel at night...

Pb – if you want to value day and night...and you've developed a parameter only for night...haven't you exaggerated this?

Nc – no – figure 4.5 diagram on page 18 – the stated pref game starts off with ppl describing what they look for in buses...what I would say is that if during that it was in daylight they wouldn't give regard to this particular attribute when making their choice – the parameter reflects the mixture of ppl valuing lighting...because they every now and again travel at light...and sometimes they don't

Pb – that's a hypothesis...that they weren't led to imagine that they'd be making this journey in darkness

Nc – its inherent that ... we ask ppl as to their recent journeys and the characteristics... everyone is given that choice. If they are not placing any weight on this...

Pb – I would draw your intention to the para about how ppl interpret these diagrams differently to what you intend... that I read out just now.

Nc – before we go out in the field with this we do undertake a pilot exercise. Part of that is to test how ppl respond to those graphics including follow up interviews. In theory yes that is something

that can happen but in practice we have done our best to make sure that is not the case – both through procedures we deployed and also through experience elsewhere.

Pb - if you could turn to nwltf 116 – on the back page there is a reproduction of the graphic you used...which as I suggest is likely to have made ppl think about travelling at night, and there is a graphic below that that would make them think about travelling in daylight. I suggest that if you had tested the lower graphic you may have found a lower value...it might have been appropriate to apply that value or to take an average of the two. Is that a reasonable suggestion?

Nc – no – we want ppl to appreciate the difference in the lighting provision – in the night time...as I go bk to my earlier answer for those travelling in the day time is that they would disregard the lighting in making their choices.

Pb – but neither of us can know without doing a lot of tests – I am suggesting that this is one reason why your lighting parameter is rather large.

Nc – I'm content with the approach we've taken for reasons I stated.

Pb – ok can we agree that if you had asked mr hanson to use a lower value then the value for the penalty for poor lighting would have been lower?

Nc – that's a circular questions... if you'd use a lower value then the parameter would be lower.

Pb – if you used the lower value it would have predicted a lower demand for ngt

Nc – yes...we established that earlier today

Pb – I suggested a reason why it might have been higher than you wanted to be – use of that pair of graphics may well have created a higher value that is legitimate and consequence is a higher demand for ngt...

Nc – we agree to differ...

Pb – you recall I pointed out to mr hanson that the value used for cctv was about four times the recc aecom report

Nc – twice

Pb – when you double it... yes when you apply to vehicle and stop

N c- our cctv parameter is a joint parameter for stops and vehiccles and the appropriate comparison is the two aecom parameters summed together.

Pb – let's agree on it being twice as big – its larger than the acon study. When you saw the rather high values for cctv and lighting you'd want to make sure they were a true reflection of leeds ppls views and not a spurious result. What reasons did you come up with when you were pondering this and how that would happen?

Nc – it comes down to the fact that we thought the survey was conducted well and appropriately and the data processed properly. When we looked at the models these are the models that gave us the best fit – after all the normal checks that ppl are making the data...

Pb – I ask whether the value is realistic and ask what I've done if the value is bigger than anyone else's

N c- we couldn't compare with the Acon report as it was produced subsequently

Pb – you've had another 5 years

Nc – and yes we have had discussions with dft and one particular thing asked to look at was the application of the quality factors when transferring to the LTM model.

Pb – as you say, these notes don't actually take us back to the survey. I suspect dft didn't look in the level of detail that we have done so today.

Nc – I can't let that comment pass... they asked us detailed and involved questions

Pb – ok then can you show us where they asked you these to check these are accurate?

Nc – they asked us to look at it after the Acon report published. They concluded they were satisfied with the parameters after that. I can't point you to a sentence that says your question, no I can't.

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Pb – I'm suggesting that good practice would have been to look at these values and question them. You did the surveys in December 2007 and January 2008.

Nc – ok

Pb – can I ask you to cast your mind back – there were a series of attacks in October, November and December – lots of bus stop attacks in the news ... people were concerned at this time. Christmas day attack makes a lot of news.

Nc – I don't remember that

Pb – do you think you could have been aware at the time when you were doing the study in 2008. You come up with values which are rather high – if I'd been in your position I'd ask if these values were affected because of these news reports.

Nc – I can't recall

Pb – the metro newspaper was headlining the knife attack on the pensioner at the bus stop. I'm suggesting that that is a plausible reason why the values they were giving you were rather high...

Nc – I can also answer that by saying that I employed best practice to make the survey as sterile as possible.

Ins – so from those surveys in 2008 have you done any other surveys since

Nc – not of this nature

Ins – they are the latest surveys

Nc – for Leeds, yes

Pb - we've established you've recommended use of quality factors which in aggregate gives advantage of trolley over all means of other public transport – we've got around 11.3 minutes of advantage.

Nc – yes

Pb- your assumption is made despite the fact that you had no number for trolley bus preference

Nc – yes

Pb – and the fact that you do recommend is based on a pref for a new bus over an old bus and this is somehow related to the assumption that trolley will be perceived as better than –

Ins – let's not reiterate...

Cameron – I'm concerned with this technique, I want to avoid a comment or submission at the end

Pb- now you've said that your reason for being confident is that dft were not unhappy...

Nc – content is the word I'd use

Pb – you are referring particularly as to the consideration given to programme entry case 2012 – we know that that decision was under some time pressure

Nc – no, I don't agree with that

Pb – nwlft statement of case appendix H-1, FOIA by mckinnon, an extract from dft in response in May 2012 to issues raised by the treasury approval panel. The question was timing – decision to make now rather than next spending review – the dft said that the funding was initially approved in March 2010 and the deferral already referred for 2 years...further deferral would cost more – and it will be in the next spending review period... there is a risk that LA will abandon this risk.

Nc – do c.2.4 – those notes there are dated March 2011 and April 2011, so the first note is fourteen months before the date of this and that is why in this regard in terms of the way we were applying the quality factors – I'm confident that the dept was not under pressure when deciding their view. These are related to government spending decisions...

Pb – I am just putting it to you that they were under time pressure and needed to make a quick decision or miss the spending period etc.

Nc – this is the dft trying to get the treasurer to make a decision – you'll realise that they are v. reluctant to do things. I see this as a simple exchange between civil servants. This is about an announcement of a spending decision. The dft would not be saying this to the treasury unless they were content about the decision.

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Pb – a different interpretation of this...

Nc – I will say that my reading of this exchange is that which I said above.

Nc – when they are happy to recommend the approval then it is taken up to a higher level for internal scrutiny. This is the normal approval procedure. It's a stage of the approval process... things that have been agreed at a technical level are reviewed and challenged. Ultimately at the end of that process they gave the scheme programme entry

Pb – they knew did they not that if they gave a yes decision they had at least two more chances to say no whilst if they said no that would be it – so the safe thing to do would be to say yes.

Nc – from my experience from working with the civil service they don't work like that.

Pb – in 3.42 of your proof you refer to public transport run times – this is all described in c-1-13. This note is dated jan 2014 but can we confirm the values in it are correct.

Nc – yes, they are the values derived and employed in the modelling

Pb – I'm referring to the rebuttal of my proof in para 2.3. the rebuttal is objector 1719. This rebuttal is dated april 2014 and refers to the reassessment due to internal inconsistencies. Just makes me wonder whether the values in the jan 2014 report are correct.

Nc – it is simply a way that data is presented in the report.

Pb – I couldn't find any difference between the table presented in the rebuttal and original [???????? 16:12]

Nc – this is mr hanson's report. You should have asked him

Pb – the values in c-1-13 as far as you're concerned is correct and the internal inconsistency is irrelevant

Nc – as far as I'm concerned

Pb – there are some concerns that the trolleybus run times are estimated more optimistically than the bus run times. e.g. table 3.1 in c-1-13, Why do you assume that trolleys won't be delayed by buses stationary at e.g. glynn road where the bus stop doesn't have a lay-by.

Nc – the run time model is not a simulation of ngt interaction with buses sharing the lanes – it is an assessment of run times based on max average speeds between section of the route. as they are average speeds, necessarily some a bit below and some a bit higher than average. We are content that the average speeds are appropriate. there are two things 1) selection of average speed and 2) some below and some above average. I'm not saying they will be perfectly accurate.

Pb – maximum?

Nc – sorry that was a mistake. The mode works by inputting the maximum speed that will be attained on any lane. So whilst an average speed is worked out from stop to stop based on acceleration/deceleration, within that max speed input there is an implicit assumption that on a day to day basis some go faster and some go slower.

Pb – so you start by assuming the max speed could be given and then you degrade that by making allowance for dwell time etc.

Nc – its simple newtonian mechanics – using acceleration and deceleration and there is a function that works out dwell time and then repeat and the summation over both sections modelled

Pb – we can get some insight by looking at plans at back of c-1-13 – a particularly useful one at page 7 headed 03-01A. if I've understood it this is basically the input data. What we see for example in red we've got stop dwell times in seconds and in green in a circle we've got the link speed and that's the max you were referring to. And then in purple we've got some numbers like junction delay etc.

Nc – correct

Pb – what this has done is that it takes us down the route it says in green this is the max speed, and then you've got a stop and you used newtonian mechanics to reduce the speed at deceleration etc. and you allow for additional delay for things like junctions. What I was looking for was an example of an additional delay due to buses stationary at bus stops without lay by.

Nc – it is not reflected as an additional delay but as an assumption of the max speed

Pb – so the max speed is itself adjusted to allow for the probability to allow for these delays

Nc - it can be

Pb – I want to know whether it was supposed to be adjusted?

Nc – if in the assessment ... it would have been if it was adjusted. Also these run times were developed in conjunction with the engineering consultants and mr Robertson. They inputted the numbers in to the models and the assumptions that went in were a joint endeavour.

Pb – when we were talking about run times they all said ask mr chadwick.

Nc – we are accountable for them – but how they were developed wasn't just us sitting in a room.

Pb – I asked whether there was allowance as to delay to ngt at bus stops without lay bys. You said that this was reflected in the cruise max speed. Can we look at map 4-1A. you will find it on the middle map (glenn road) – we come to west park roundabout and then a junction that says 'ND' and then we get another junction which is Glenn Road (ND means no delay) – then we get a dwell time of 10 secs at the ngt stop and another junction. I'm just noting that we have the same speed throughout the map...doesn't look to me as though those have been adjusted to allow for absence of lay by etc.

Nc – that's because there was no need to make that adjustment in the judgement of my colleagues who made this times. if a vehicle were delayed it could go faster than 30km/hr...

Pb – this is either a prediction of what ngt run time could be or it isn't – you said that cruise speed could be adjusted...but now you are saying that its not needed

Nc – in this particular example I'm saying the analysts thought it not necessary.

Pb – ok so lets go back to 03-01A on previous page – one thing that mr smith said to mr Broadbent was that you would have allowed for the fact that ngt vehicles would find it difficult to overtake a cyclist on the narrow stretches of shared lane. He was very sure that would be included in your ngt run times. I'm right to say that mr Broadbent identified a very narrow piece of ngt lane outside leeds uni and that is to be found on the bottom map on the page half way along. You can see some big buildings marked there. A building with a distinct circulate feature. A little to the left is a big building which is a civil engineering building where lane is narrow. Where do we see the particular slowing down (which will incur to allow for trolley when sharing with cyclist)?

Nc – well if you look at the speed next to that its 40km/hr but this is 30kmh – the analysts have taken account of that

Pb – ok can we lok at further stretch a wide stretch up hyde park corner – the assumed cruise speed is 30 kmh..

Nc – a wide stretch but has lots of side roads... compared to woodhouse moor which has no side roads...

Pb – I'm wondering where you have reflected the fact that they have to go particularly slowly near the leeds uni and mr smith said that your model allows for that.

Nc – I believe it is allowing for that when adopting the 30 kph.

Pb – it's a coincidence then.

Nc – no there is a no. of speed bands to deploy – we allocate each link to a particular set of characteristics... e.g. are there side roads/ped activity etc. and that is informed research and taken into account when allocating speed.

Pb – ok so if we look at the same map and look at area of shared activity from blackman lane up to corner of Blenheim walk diverging. Again its 30kph. This is an area where mr smith said max speed should be 15 and some suggested 10.

Nc – this is 18 here.

Pb – max 15, ideally 10.

Nc – I wasn't present when mr smith said that so I can't comment. However, earlier today in my view (i recognise the decision is a matter for those who have authority over safety) that we have adopted speed that is safe in those areas. if the ruling speed became lower then we would have to change the model, yes. I said that it would be in the region of adding 20 seconds to the journey time.

Pb – well we don't have a view of what happens if you actually need to correct all of those – an aggregate delay of the run times.

Ins – can I look at another example e.g. by the museum – a new ped area which will be used.

Nc- Plan 03-01A – the bottom section has a right hand turn and that's going down the hill – there is a 20kph – that is the max speed as there is a kink in the road. That link is not physically possible to reach that speed though... in the detail tables the average speed which take into account deceleration etc.

Ins – well I haven't looked at it in any great detail but it came to mind that that is a particularly sensitive area. In fact, I've had evidence that someone has done a ped count in that area recently.

Nc – if you look at the tables, c-1-13, and the code which it says 'option' in the top-left corner. If you go to 04-02A maps, this is ngt north line south bound. The section we are talking about is that the arena ngt stops could reach 23kph. Its saying that the average link street is 14.1 or 8.8kph – that is a combination of the accelerating and decelerating – I have to dig in to the model to find out whether they will actually be able to reach those speeds

Pb – you've made the allowance by the museum and they end up with average speed of 8.8kph. perhaps from a safety point of view that would be regarded as ok. But my question is outside the university where lots of students and a surge of them in and around peak times. yet on that link, instead of assuming 20 kph you've assumed 30. The case that the museum indicates that it is perfectly possible for this model to be adjusted but it hasn't been in a no. of instances that I've looked at

Nc – because we've considered it not necessary to adjust it we've chosen the appropriate profile. And if subsequent work identifies we will adjust it.

Pb – I was concerned as to the asymmetry between the ngt and bus assumptions. The ngt seemed to be on the optimistic side and bus the pessimistic side.

Nc – I disagree, I say that the ngt is on the pessimistic side. Mr Robertson would say we won't have these delays. We've taken quite a conservative view of the max speed which is well below the prevailing speed limit.

Pb – he said that the priority would degrade as you get above one incident per six minutes.

Robertson said it would get worse the more trolleys you try to bring in. in 2031 – you propose to insert 14 trolleybus but yet you assume that the run times will be the same in 2031 as 2016.

Nc – we've made no assumption as to the run times in the extra 4 vehicles... we have taken the costs of running those vehicles into account but not anything that would come from a frequency effect and any dis-benefit from a run time effect. Should they be inserted in such a way that all vehicles are targeted as having the same journey time.

Pb – as I understand the ngt run time is assumed the same in 2031.

Nc – LTM has an assumption of 10 ngt per hour at the run time we've set out in 2016 and 2031.

Pb – so its assuming the same run time for ngt in 2031, as it is in 2016.

Nc – correct

Pb – and yet in order to carry passengers you're proposing there will be 14 vehicles

N c – we've allowed for the cost of 14 vehicles

Pb – but not the delay that will happen

Nc – that comes bk to the exact detail as to how that vehicle will be inserted...e.g. short running etc. whether they will be inserted into a core schedule or what. That has not been decided. So I think what we've done is a prudent approach – if we went to a situation where 14 vehicles are provided at an equal headway – we can't afford the same journey time [according to Robertson]...but there would also be a frequency effect to take into account. It would increase the attractiveness of ngt as the frequency would increase.

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Pb – can we turn to your trolleybus dwell time equation which we find on para 2.19 of c-1-13. The dwell time calculation is 7 seconds + [0.7 seconds x boarders] + [0.7 x alighters]. Is that not fairly optimistic.

Nc – this is based on empirical research. Also it said we stuck with a constant 7 from a constant of 9.4 seconds

Pb- so you are saying that you have reduced this from the tfl guidance figure of 9.4

Nc – yes

Pb – we've got 0.7 seconds for boarders and alighters on average. Given that some ppl (disabled etc.) will take a while, everyone else will have to board pretty sharpish to keep the average at 0.7.

Nc – yes but I return to the point that this is based on empirical research as to what happens

Ins – is there anywhere in the documentation

Nc – footnote on page 5 of the report which is the source of that research (from TfL).

Pb – I call them to your bullish estimates of trolleybus – compare these to your restrained estimates of bus run times.

Nc – you call them restrained.

Pb – 16-01A maps of c-1-13, we are now talking about do min bus assumptions. Why do you assume there will be a ten second junction delay at st michael's road. You'll find that in the middle map. You see a red 30 minute of dwell time and a 10 second delay as well. What is that 10 second delay.

Nc- I don't know – I have to have a discussion with the analyst that did that.

Pb – can you imagine that would cause that 10 second delay?

Nc – I have to have a discussion with the analyst that took that view. But the maximum speeds are in the green circles and on the one hand you are telling me the ngt run times are optimistic and buses aren't – but on the whole the same max speed is being applied in both situations.

Pb – where there is a shared lane yes quite reasonably, it's not going to overtake one another. We found examples where we had been led to believe run times for ngt would allow for issues that slowed ngt down but in every case the same max speed was applied. in your evidence in chief you stated you modified these max speeds but when we look at it there is none other than examples of the museum.

Pb – have your bus run times allowed for the fact that buses would be allowed priority in the preferred option –

Nc – a detail I have to clarify but my view at this moment is that the bus run times in the preferred option reflect the specification...

Pb – mr robertson's 3.2 indicated that that was the case – I'm asking where we see that on any of these maps/tables

Nc – I can't highlight it to you

Pb – but you are quite sure it is there somewhere

Nc – I said I'm quite sure that the run times reflect these specifications

Pb – para 1.9 of c-1-13 – 'forecast contained within this doc relies on numerous external circumstances and judgements that can change quickly' – what does that mean

Nc – that is a catch all disclaimer for all consultants.

Pb – 'there are numerous judgements that are influenced external circs that can change quickly' What do you have in mind?

Nc- I don't have specific circumstances but I know it can change – it is a standard disclaimer

pb – so we should assume that all of these docs should have this disclaimer

Nc – yes of course

Pb – can you suggest one that also has a disclaimer

Nc – I'm not going to do that – I am happy my colleague has inserted it in it.

Pb – para 1.10 ‘in addition it’s been necessary to base much of this analysis on data collected by 3rd parties’

Nc – that’s a standard disclaimer – included automatically into our template now.

Pb – who was the author?

Nc – the control sheet on the very last page of the doc...

Pb – we don’t have that...what does it say?

Nc – it comes just before the maps. Andy Barker reviewed by Neil Chadwick.

Pb – so at some stage you satisfied yourself that they’d done all they needed – so you will have considered whether it was appropriate to put the 30kph outside the uni

Nc – my role is not to look at every assumption applied by every analyst – its to satisfy myself that the principles applied are appropriate and that the principles in themselves have been applied appropriately.

Pb – so its just a review in principle.

Nc – a review of the methodology deployed and the assumptions that go into that methodology – but I’m not sitting there saying take me through each and every assumption that you’ve ever deployed in this model – that is impossible to do, in the context of the entirety of the technical knowledge applied in this project. Responsibilities are delegated to my colleagues. I am accountable for this report but within that I have delegated responsibilities to do things – in same way Hanson delegates.

Pb- in your examination in chief you sort to diffuse criticism that your run times remain unaffected by congestion – you said that ngt is insulated from congestion – is that what you were suggesting?

Nc – I am saying I am confident that run times will be as they are in 2020 and with a 10 vehicle per hour frequency and that at 2031 as well.

Pb – when you went through in chief you said they are designed to be insulated from increase in congestion

Nc - yes

Pb – so what happens if congestion increases in the morning peak southbound down headingley hill – there was no bus lane. Let’s assume that that congestion is worse. What happens to the ngt vehicle?

Nc – if it got materially worse the run time would be extended over that section

Pb – so then your forecast would be wrong

Nc – it wouldn’t be the right one to put in the model

Pb – and this is what you put into the model

Nc – yes

Pb – you persuaded hanson to drop the TH factor – instead you got a static assumption about the level of congestion. By removing the TH you have no way of automatically picking up the fact that congestion increases.

Nc – yes correct

Pb – so we’ve just established that the forecast for 2031 for run time of ngt assumes there has been no increase in congestion

Nc – the run times of ngt is not materially affected by any traffic, it is assumed that

Pb – and was there any material increase on that stretch

Nc – we don’t consider there is in such a way that we have to revisit those forecasts

Pb – is there or isn’t there

Nc – I don’t consider that there is.

Pb – so that is immaterial? we can say that those 20-30 seconds to get down those roads – that’s fine...

Nc – mr hanson’s model is not in sufficient detail to look at those sections – I’m happy that my analysts working with mr Robertson have come to a view of what the delays down the route will be and that is appropriate to use the same figure in 2031.

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Pb – so we look for an analysis not by mr hanson but Robertson of changes in congestion through to 2031.