

NC	<p>I have some docs to hand in: APP132: a response to FWY125 on seating capacity of vehicles. APP134 -also a response to FWY125, size of seats. APP133: a response to Mr Alexander's rebuttal on bus route length. There will also be APP135 on stages of funding from the DfT like "programme entry".</p> <p>Can I also make a personal request to sit from 9.30 til 4.30 on Thursday.</p>
GJ	No objection to that.
	Mr Dickinson Cross-examination
MW	Dr Dickinson.
Q	Mr Hanson, you said you were expecting people from inside the ring road to drive out to the Park and Ride - and there was a zone plot showing this - can I see it?
PH	To go back on yourself is less desirable and the forecasts reflect that.
MW	Do you make it less attractive than another site or apply a bias?
PH	The short answer is no. Looked at Pudsey and Garforth. The model allocates people according to their merits.
Q	You increased the drive time factor to restrict the catchment area to 3 miles for P&R? Why?
PH	Attaching a large weight to car time means it's less desirable to drive a long distance. What we observed in Garforth and Pudsey was people were demonstrating a reluctance drive long distances to use P&R sites.
Q	If people drive long distances the they won't bother to stop at P&R
PH	That's what's observed yes.
Q	Isn't the main purpose of Stourton to catch long-distance travellers?
PH	I'd draw a distinction between the aspiration and what we've observed.
MW	What makes you think coming down a motorway people won't use park and ride?
PH	What we've observed - 2 large ones and one other that's very lightly used.
MW	Those are not near motorways?
PH	No.
Q	We'd like to see the zone plot for Stourton too.
PH	Don't see why not.
Q	Once the data's in, doesn't take long to rerun a model. So was going to ask how long it would take to rerun with difft asumptions and quality parameters.
PH	The model is a relatively complex one and does take a considerable time to run. The specifications haven't been provided to the inquiry but can be if it's useful. The runtime constraints are severe and that's why there are limitations in terms of zoning detail. So running it, to get the outputs without looking at them, is about a day.
Q	It would be possible to run other sensitivity tests with difft parameters.
PH	Of course it is, but difficulties with taking data and it needs checking and a model test is typically a week.
Q	I've some experience with dealing with very large data sets e.g. Clinical trials. Thing I have no evidence of is any confidence interval estimates. Have you in fact made any confidence interval tests as well as the central parameters.
MW	Can you explain "confidence intervals"?
Q	Takes account of uncertainty in the data. E.g. If you take a 95% confidence estimate then 19 out of 20 runs would fall within a range, called the "confidence interval". If the range is very narrow, you can be confident the central forecast is reasonable. If it's wide, as I suspect it is, raises questions.
PH	Simple answer is no, I haven't made any statement of confidence intervals. Nor is there any guidance that you should. Would need to do a considerable no of tests to identify the sources of error. Have taken place in trials attempting to do this but not fruitful. This model is of a usual standard
MW	For this sort of model, would you expect confidence intervals?
PH	No - would take too much time. There are some situations with a single output where that is done, or with simpler models. But in this case it wouldn't be reasonable proportionate here.
Q	Yes but the one forecast we are particularly interested in is the patronage figure for NGT. And where the P&R estimate is plus or minus 50%, what feed through does that have overall. This has a great significance for judgments about the commercial case.
PH	It does and I'm sure you'll ask Mr Chadwick about it. I can give you a view but not with any analysis.
Q	What are typical ranges for transport models?
PH	I can. I would like to see studies looking at how models have performed. Have not been a large number of public transport schemes in this country so the data is weak. Generally the outputs would be plus or minus about 30% or the use of new infrastructure. That is the basis of the WebTAG guidance and is understood.
Q	In your para 6.7 of your main proof you say "effect of these improvements is forecast to increase public transport use along the corridor by 50%". Is that a typo, because the figures you direct us to do not address that?
MW	Yes C-1-8 it says it's taken from.
Q	They are not actually numerical figures.

PH	I think then I took a numerical average of the flows.
Q	Seem to be 20-25% to me. And the corridor is not going to include rail?
PH	No - this was specifically patronage on the corridor.
MW	Which buses?
PH	All the buses shown on that corridor stopping there.
Q	In C-1-8, tables 50 to 54 may be easier to look at - seems to be only 20-25%?
MW	Is it worth leaving this to be checked, if you don't have follow-up questions. Can you do it now?
PH	Which tables? They are different measures. I was going to look at the tables set out in APP-122 where I had sought to answer your questions on overall demand. I've extracted the number of trips being made wholly within that corridor, looking at passenger kilometres. In the AM peak I can see adding 17600 without NGT (first row in the second table) page 4, and the increase is of the order of 50%.
Q	Passenger distance rather than passenger numbers?
PH	Indeed but that's passengers passing points on the service.
MW	It would be helpful to write down how you arrived at that 50%
	Mr S Mr Hanson
MW	Mr Sleeman.
S	Given that we've had some discussions that in shared areas speed limits may have to be lowered from the original estimates would you have to re-run your model to look at traffic emissions and noise?
PH	The outputs here are mainly car emissions and noise. The number of trolleybuses operating through those areas wouldn't be affected. The speed of the would but there are no emissions emitted at the street from those vehicles. If the areas were used by other vehicles, yes there would need to be. If they had a material impact on the speed of the trolley buses, that would also need to be assessed.
S	In the University area there are there vehicles aren't here?
PH	There are other vehicles accessing the university but the model is not of a resolution or detail that can look at local traffic.
S	Doesn't it need to be re-run.
PH	I am not aware that there are changes of a magnitude that would affect the model. A statement of awareness - I don't know.
S	So it's another uncertainty?
PH	Yes.
S	When Prof Bonsall referred to 3.13 and asked you to agree if testing other scenarios is beneficial and you said "yes".
PH	In identifying alternatives, yes.
S	Have alternatives or neighbouring corridors that might then affect the A660 been examined?
PH	The involvement I've had is relatively recent. I haven't done any. What I have seen is the tests I have done have been aligned...or the business case was not significantly changed since I came along.
S	Mr Farrington's wish list included improvements to the ring road for traffic from the other side of Leeds. As far as you know there's been no modelling of that? A6120.
PH	I haven't been asked to do that. I don't know.
S	Don't know of any modelling of possible improvements to Meanwood Road that runs parallel to the A660.
PH	No.
S	Back to the corridor itself - have you seen any modelling of tidal flow.
PH	Tidal flow would be allowing traffic in one direction. I've not done any and am not aware of any, no.
S	Can Insp take it then that no examination of the sort of interventions to ameliorate congestion on the A660 has been done so far as you are aware?
PH	I'm not aware of any modelling of the sort I would do.
S	The modelling you've been asked to do is purely confined to the original strategy for the A660.
PH	The strategy pre-dated my involvement. I've not done anything that would test alternative strategies.
S	Tidal flow has been called "intelligent transport systems"?
PH	There have been places like Hong Kong where that operated.
S	In Cardiff it operates
PH	Used to operate in Blackwall Tunnel.
MW	Yes and in Birmingham.
S	That hasn't been looked at?
PH	No.
MW	How far would you expect people to walk to an NGT stop in the model?
PH	The mode...there is a hard assumption that people will not walk more than about 1.5km. That's not an assumption that people will walk that distance but a limit to the area of search where people are assumed to be willing to walk. It's a trade-off where people may choose to walk further to reach a quicker route. The out-turn is typically an average might be about 400m.
MW	Has that output been used in the model?
PH	The walking time is an input at an input walking speed of 4 or 5 km/h. As the time gets

	longer, people get less inclined to use the service. It's a consequence of assumptions in the model not a direct input. The proportion who choose NGT decreases as the walking time increases. If it helps you, I'll take you to C-1-8 page 42.
MW	Is that the same as for a bus or different?
PH	Well we've discussed that it is faster and has a higher quality but also has a slightly lower frequency than the combo of bus services in some places. Overall slightly more attractive and the model would expect to show a slightly longer walking distance.
MW	Have you allowed for people to cycle to an NGT stop?
PH	There's no representation of cycling as a separate mode.
MW	Is there going to be a way of taking a bike on an NGT?
PH	Er, it's not a level I've considered.
MW	Those are all my questions, thank you. Mr Cameron if you can start.
NC	I'll go back pretty much in the order that you were asked the questions. I will try to ask the questions with a degree of clarity but if I fail please tell me. And also not all my questions will be capable of a yes or no answer as I'm not allowed to ask questions that suggest the answer.
	You were asked by Prof Bonsall whether the impact on the economy was dependent on the model but you later agreed that it was right for clarification to be given to the inquiry by me and the answer was "yes". Can we take up C-1-18 please? Page 11, Para 3.6 please. There's reference to West Yorks Urban Dynamic Model ('UDM'). Does 3.6 tell us whether representation in the UDM is dependent on an output of the LTM?
PH	This says, the reduction of transport costs from the LTM are used in the UDM, yes.
NC	You were asked a series of Qs about the fitness for purpose of the LTM. In particular by Prof Bonsall. Is it or is it not necessary to consider the purpose in question?
PH	Yes, you are considering the purpose or purposes to see whether the model responds appropriately to them.
NC	Bearing that in mind, you were asked whether the model was fit for assessing impacts on particular road networks and particular junctions. Prof Bonsall put that he would conclude it would not be fit for purpose. You said it was supported by local junction models. Later on when asked Qs by him, I think, you said the model was fit in the sense it was sufficient to look at corridor solutions but not for isolated interventions. Can you clarify the purpose for which you say the model is fit?
PH	Er
NC	What did you mean when you said it was sufficient to look at corridor solutions?
PH	The first objective is to look at demand for NGT. The first question is whether the demand forecasts are appropriate. I don't believe there has been any question raised and am satisfied the model is fit for that purpose. That is a very high level answer. As we move down to geographical detail there have been questions for instance about local cycling schemes. The model does not have that detail and should not be used for that purpose. Another Q is design of junctions. Have been explicit that the outputs should not be used directly. What has been done is an interpretation of the outputs together with the local junction models.
NC	What if any other data has been used for the purpose of the local junction models?
PH	Additional info on the traffic turning counts.
NC	Can we go onto ...you were asked Qs about zones and centroid connectors. And asked about...was put to you that the zone centroid connectors were in rather odd places. And a number fed into Headingley Hill and the stop there rather than the Arndale Centre. Can I just...And you were asked about some zone plans (Appdx B to NWLTF Statement of Case and NWLTF-108. What you said was that there were another 2 zones where the opposite is true and the model will understate NGT use relative to bus. How do you come out at the result overall - how do you validate or test the model?
PH	The model validation is tested by the flow observed along the corridor, so an independent count of how many people are using different corridors.
NC	Can we take up C-1-3. What was the outcome of the public transport validation- am I looking in the right place?
PH	That's correct. So the validation is set out in tables 3,4 and 5 which compares the models with observed flows and shows they are within the tolerances of WebTAG.
NC	So do the questions of definitions of zones raised by Prof Bonsall lead you to have any concerns about the outputs of the model?
PH	They show imprecisions but I don't think there is any bias in them and nor do I think they are of such magnitude that they are significant.
NC	If we consider the variation from the observed - within or outside the WebTAG guidelines?
PH	Within. At times higher, at times lower, but overall very close.
NC	What did you mean by "shown to be appropriate"?
PH	The responses from the model if I improve or worsen NGT is of a direction and a scale that is consistent with the evidence I have seen in other places or contexts. It doesn't exist at the moment but I am reliant on analogy.
MW	With what evidence?
PH	Forecasts I've seen elsewhere, elasticities, benchmarks in guidance.
PH	Model responds appropriately to changes in public transport provision, so fit for that purpose. [MW: Can I clarify what purpose?] I was commenting on changes to public transport provision on the corridor.
NC	You were asked about, and attention was drawn to E-3-15 -TAG Unit. And para 4.3 "detailed considers". You were asked about the bullet points and in particular about "not span barriers to movement" and attention drawn to a zone that spanned a road. I'd like your opinion whether or not construction or representation of the zone adversely affects or undermines the model in any material way.

COUNTS OF EXISTING TRAFFIC NOT RELEVANT HERE!

PH	Answer is no. If I read the second bullet, there is a requirement for zones to follow census output areas. I must admit I find those areas extremely inconvenient because they do span roads and railways. There is a need for a balance between different objectives. Either I have to make assumptions to redefine the geographical area, or I have to make a different set of assumptions. In this case we have sought to assess that balance.
NC	Good time for a break, Sir. [11:15]
MW	I'll adjourn till half past 11.
[11:30]	
MW	Any issues arising in the break?
NC	I was going to put in a document APP-135 but I don't know if Mr Jones wanted to take a point-am happy for him to have longer to read it.
	Quality parameters - C-2-4 is the quality factors report. You were asked about a paper by Johnson, Brandeis and Wardman which was a review by UK Tram. This, Appdx A March 2011 and Table 1. Which person, firm or group of people were responsible for deriving the quality parameters recommended as set out in Table 1?
PH	Mr Chadwick's firm were resp for the stated preference research and the parameters from the interpretation of that research.
NC	You were asked about the penalty for no CCTV is that a penalty that came about from your work or SDG work?
PH	SDG work.
NC	On crowding, can we take up WebTAG E-3-17. Page 17, para 6.4.1 second sentence. And 6.4.4 a recommendation - "should only be modelled where likely to have a significant effect on behaviour or is one of the objectives of the scheme". Can you assist whether the guidance indicates a crowding factor should invariably be applied?
PH	The guidance indicates that crowding can be applied but it's not mandatory.
NC	Your view whether or not it was appropriate to apply that factor in this case.
PH	I think in this case the scheme is not designed specifically to alleviate crowding so I wouldn't judge it essential to apply it.
NC	So not essential but was it appropriate or not?
PH	I explained my reasons earlier why I consider it was not appropriate to represent crowding on bus services and the consistency of NGT and bus is an important consideration. On that basis no I don't think it was appropriate.
GJ	Hold on, your answer in cross-examination was that the assumption on NGT was given by SDG, not your assumption?
PH	Yes.
NC	That wasn't my question. Can I ask you, another answer you gave was that there "is a sensitivity test I have done that looks at that". Can you say, where is it presented?
PH	In my rebuttal to Peter Bonsall Reb-2-1719 paras 2.10 to 2.12.
NC	Para 2.11 - assumes all passengers have to stand and will overstate the impact of crowding. The outcome?
PH	Showed a 4% reduction in NGT demand based on those assumptions.
NC	If we go to Qs asked by Mr Jones that he's just reminded us of and your answer. It was put to you that there was a risk of inflating the NGT case and you said if there was significant crowding it would suppress demand. Does your test give an indication?
PH	This test indicates that the degree of any suppression will be very small, negligible.
NC	Can I ask about Qs asked by Prof Bonsall about the "peak of the peak", and there was a factor applied to get the busiest 15 mins in the peak period. We multiplied 14.53 by 1.27. I'd like to ask a simpler question. Can you give us your view as to whether it is appropriate to apply the busiest quarter of an hour to the whole hour?
PH	Crowding varies through the hour. In most circumstances you plan services for busy periods not the busiest periods although there are rare circumstances where you would plan for exceptional peaks in demand.
NC	Other quality penalty. The representation of bus stops. You were asked about the approach taken to bus stops for comparison purposes. C-1-8, para 4.2 page 31. Bottom of page NGT stop quality is 1.27. They say average for base year is about 11 mins for bus stops but adjusted by 4 years to reflect roll-out of CCTV. So what is the comparison that has been made between NGT and ordinary buses. Is it the base year or reduced value?
PH	The difference reflects the assumption in the future so the advantage is between 5 and 6 minutes.
NC	Thank you. You said the improvement to stops was not in "do minimum" but in "do something" - can you explain what you meant?
PH	The adjustment made in the model is to reduce the advantage for NGT rather than increase quality of bus. For historic reasons for ease of sensitivity testing. Does imply an understatement of bus demand in Leeds to a small degree - a few percentage points.
NC	One or two percent did you say?
PH	I'd have to look at it but of that sort of order.
NC	Any material impact?
PH	I don't think so.
NC	You were asked about validation and calibration. You said observed delays are not an input into the model and used 2 separate data sets to test its performance, can you explain what you meant by that?
PH	In developing models, good practice is to test that the model data has been assimilated correctly so it can be tested against something independent - a check that the model is correct. The process we followed in developing the model did apply that. The limitation of that is, the mode data we can put in makes the model better so taking data out, while it

	applies a useful check, actually makes the model worse. In terms of the highway model we took data out and added those in addition and the model was adjusted to accommodate them.
NC	You were asked about Weetwood Lane. We need APP-103B, page 6 of the diagrams. Page 20 in C-2-9. CP979265 Then, C-1-3, page 9. To take the NGT screenline pages 8 and following. For the 8 o'clock hour it gets the indicator "FAIL". Is the discrepancy recognised in this validation report?
PH	Yes
NC	Is it taken into account in the overall judgment?
PH	Yes.
NC	Is the word discrepancy right?
PH	There's a variation around the observed- some are from errors in the count and some from errors in the model.
NC	Are they taken into account on the overall judgment of fitness for purpose of the model?
PH	Yes they are.
NC	The subject of ASC and its application to Park and Ride sites. Remind us what it stands for.
PH	Alternative Specific Constant.
NC	While we have C-1-3 to hand and we go to page 41. Table 16. You were asked about Garforth, New Pudsey and King Lane. It reads, "Generally of a similar order". What does that mean and how has it been used in relation to derivation of ASCs?
PH	The model is looking at the proportion of people who use P&R as opposed to drive when they visit the town centre. The ASCs are part of that comparison. Where there is a very large cost differential people tend to choose the better alternative. When the differential is less, people's choices are more even. ASCs are part of that differential.
NC	Take New Pudsey- total PT cost 87, highway cost 27. Difference is 60. Does that mean people who use New Pudsey have total cost of 87 whereas if they went by road it would be 27?
PH	Yes
NC	People who choose P&R do so, for whatever reason, despite the difference of 60?
PH	Correct.
NC	What does that have to do with ASCs?
PH	The ASCs explain why that is.
NC	Mr Jones asked you about Supertram and was clarified later. Was put to you that Supertram funding was withdrawn because patronage figures were not accepted. At C-6-1.
GJ	I did correct that. It refers to cost and is all about what costs means.
MW	Do we need to go to it?
NC	No.
GJ	Sorry I missed my cue.
NC	Assumptions were made as to bus operator reaction. You were referred to paras 6.6 and 6.7 of Mr Henkel's evidence and you referred to a sense check having been done. One of your answers- "you asked what sense checks I undertook, do you want to know the answer?" Did you want to tell us- what sense checks did you want to refer to?
PH	The demand has reduced by about a third.
GJ	We explored it- I did give an opportunity.
NC	Just wanted to check there was nothing else.
	Now you were asked about data collection, surveys in 2008 in relation to C-2-3. And you said, if this was taken forward you wouldn't anticipate substantial additional work to be prepared; quite happy for DfT to scrutinise forecasts. You were asked about degree of confidence and said nothing explored that was not within the proof. It was put to you that individually the individual tolerances may not affect it but cumulatively there could be a different outcome. Your answer was that was a reasonable hypothesis. Turning from whether it was a reasonable hypothesis or not, what's your opinion on the outcome for the purpose for which it is used and in particular for formulating a business case?
PH	The outcome is a comprehensive survey of Leeds of a high standard for work of this sort. I haven't seen and am not aware and don't believe there are any major structural changes in the corridor that would have significantly affected travel demand to date. The modelling processes I think are entirely appropriate so I think the outputs are suitable and comply with the standards that would be expected to prepare a business case.
NC	Does that take into account the possible cumulative impacts?
PH	Yes there are uncertainties. I think I've illustrated the range. I don't think there are substantially wider tolerances for the sort of model...
NC	You answered 'yes'- does it take them into account or not?
PH	Yes.
GJ	I do object where a witness said it was a figure fed by SDG and then told he's endorsed it. When it was outside a witness's expertise we were asked to move on. He told us that the work on cumulative impacts had not been done and now he's given an answer that it has been done.
MW	I think you can make that clear in your own evidence...
GJ	Obviously, we cross-examined on the basis on the answers he gave and
MW	Perhaps Mr Hanson can explain.
PH	I've commented on the type of range that these kinds of models have been expected to produce in the past - around 30%. I've done sensitivity tests showing about 10% variation from planning assumptions and 10-5% from the scheme itself. So together showing a range of about that.

MW	You said you hadn't done the cumulative tests though?
PH	What I'm considering are the scale of the impacts. The indiv ones are all fairly small so when I add them together in my mind now.
MW	Not based on any tests but your opinion now?
PH	Yes that's correct- I haven't formally tested.
NC	Can we look at student changes. You referred to C-18 appendix A- land used changes used in the forecasting. It was put to you that student popn changes have occurred. You didn't dissent from that. Have you seen details or any analysis of the student popn changes that enabled you to agree with that proposition?
PH	There has been a report- I'm sorry I don't know if it's in the documentation for the Inquiry - that looked particularly at accommodation of private landlords as opposed to campus accommodation. It did refer to where, location where students were accommodated and I did refer to students in the town centre being in the similar magnitude. Certainly not a precise definition.
NC	Is there any precise definition that you have seen?
PH	No.
NC	You agreed that this was a "pretty rough and ready approach". What did you mean?
PH	This list does not itself show who is living in the houses but it gives an indication and how it might develop over time. In terms of the specific question it doesn't tell us where students live. Essentially it's assuming a similar proportion of residents over time, living in the different areas.
NC	You said no difference in students along the corridor and referred to a report by the Students' Union. Is that the same one you just referred to?
PH	Same one.
NC	Did you say a 5% reduction in patronage if a 50% reduction in students?
PH	I think I said a less than 5% reduction.
NC	Has there been a 50% change?
PH	Not so far as I am aware.
NC	If necessary you can produce the report?
PH	Yes.
GJ	We cannot - I didn't keep pushing you in cross-examination because you said you don't know.
Mr Todd	It's in my evidence 171 at footnote 4.4.
GJ	I do raise a concern where we are now getting a new examination in chief. You Sir intervened, "do you really know anything about it" and he said no, and I moved on.
NC	My questions arose out of our questions.
GJ	No criticism of anybody.
PH	Reb-2 OBJ1719 at para 2.20 to 2.21, rebuttal to Prof Bonsall.
NC	On Mr Sleeman's questions today. You were asked about consequences of a reduction in speed limits. Leaving aside whether anyone has agreed to any reduction, on shared areas referred to by Mr Sleeman, what were the other modes of transportation?
PH	Normally, pedestrians and a mixed of use. Must admit I'm not sufficiently conscious of what areas are being referred to here.
NC	You were referred to vehicles accessing the Uni. You said the model was not of a detail to look at details of access. Your view as to whether there would be any need to rerun the model?
PH	I would need more clarity as to what changes were being proposed and what would be their effect. They sound to be of a nature that would not be material to affect the forecasts but I don't know enough to be definitive.
MW	I think it's reasonable to have a break =- adjourned till half past one. [12:33].
	[13:40]
MW	Any matters arising?
NC	Want to put in a note by Messrs Haskins and Chadwick to explain the approvals process for funding. Attached is guidance from Sept 2009. Archived and no longer extant. We wrote to the section in DfT that deals with funding (separate from the section making Orders) to find out what the status was. There's a template application form. The doc I wish to ask Mr Chadwick about is not extant guidance and is from before the new system. Didn't want to put it in
GJ	Want to raise concerns. Appendix 3 is e-mailed correspondence with DfT. Obviously a degree familiarity - calls him "Charlie". Mr Gifford asserts that DfT procedures are being challenged at this inquiry. I am uncomfortable with Promoters communicating behind the scenes with DfT, who are the decision-maker, outside of the Inquiry. Reference to mobile numbers. Sent 13th June. Signed "Department or Transport". Concerned it's a very speedy response same day and am suspicious there were conversations before over the phone. And the author feels it's necessary to say "nothing should be taken to prejudge" this inquiry. Shouldn't secretly communicate with DfT for the purpose of this Inquiry - it should have been raised with this Inquiry. I wish to lay down a marker for the future and complain.
MW	What I want to know is, why it's been done and what the purpose is?
NC	Can answer that. Before I do, Mr Jones wanted to know if anyone from Mr Chadwick's team or anyone else spoke to Mr Sutherland. Am told not before but did afterwards. Why asked? Promoters wished to put this guidance doc before the Inquiry, but realised that it was no longer an extant document. Wanted to know what Dept's position on it was. Purpose is merely to put this guidance before the Inquiry so you have a clear explanation as to the

	procedures that are followed.
MW	It seems to me though that the wording that's put to me from Mr Jones doesn't say that and suggesting something's being asked in this inquiry that isn't being asked.
NC	I accept Mr Jones' point and I don't seek to rely on that assertion.
MW	I am concerned that that's been put to the Dept and the response may be coloured by that.
NC	What it explains is, as far as I can tell...this isn't a response to that assertion but an explanation as to the process that will be followed in relation to the Leeds NGT. An explanation - to fill a hole - because if you looked at the extant guidance it wouldn't help you.
MW	If that's the case I don't see that there's an objection but that e-mail doesn't ask that.
NC	It properly says it's without prejudice to TWA Order procedures.
GJ	The older guidance is in an archive and can be accessed so in principle I don't have any objection to that.
MW	I would like all further comms with Dept for the purpose of the Inquiry to be agreed in advance with the parties.
NC	I'll undertake that myself or Mr Walton will raise it in future at the Inquiry.
	XiC of Neil Chadwick ('Ch').
NC	What other projects have you had experience of?
Ch	Metrolink extension to Ashford-under Lyme, though not as a witness at inquiry. Was promoters' witness at Salford-Manchester guided busway. I led the demand modelling and economic and financial case for Dublin tram, inc the application for EU co-funding (opened in 2 phases in 2004)
NC	Did you have any involvement with DfT decision not to fund Supertram 2005-2007?
Ch	I did - led the technical team advising Metro. Demand model and second piece of support was broad-based technical support to Metro throughout the project.
NC	Read from 1.4 to the end of your summary.
Ch	[reads]. [electric hybrids as NBA]. [Superior to NBA economically] [financially sustainable although costs more, it has DfT funding available and a "clear delivery route"]
NC	On facts stated being true - Appdx 7.3.8 headed "analysis of monetised" BCR 0.59 subsequently changed in APP104?
Ch	Correct.
NC	Explain briefly what's happened, then take up Business Case.
Ch	Mr Hanso explained an error in specification of bus stop quality in the LCA tests, identified after PsoE exchanged. We re-undertook the appraisal of the LCA and the results of that are set out in APP-104.
NC	Keep out APP104. A number of tables - take up C-1- table 17.3 on page 17-4 in C1.
Ch	The table is 1.2 of page 7 of APP-104. Table 1.3 in APP104 then replaces Table 16.3 on page 16-8 of Doc C1.
	Table 1.4 in APP104 replaces the RH column in Table 17.4 on p.17-5 of C1.
NC	While we're at it, a comparative table. The preferred option also changes to get to the BCR?
Ch	Correct - replacement column is found in one of the Appendices to my proof.
NC	Do these changes affect the analysis and the comparison?
Ch	Changes the numbers but nothing in the numbers that change my opinion.
NC	Other changes?
Ch	Would like to highlight 1 further Change that relates to Chapter 11 of C1. In Fig.11.1 on page 11-1. The figure does not show the additional peak service set out in the operating costs for the hours of 7 till 8.
MW	Will be the same as 9-10 then?
Ch	Yes. And Para 11.13 on p.11-10 should say "7 till 8".
NC	Does that necessitate change to punctuality report?
Ch	You mean the operating costs. The operating costs are correct.
NC	Mr Hanson said there was an error in inputs relating to fares (para 8.13 of his proof). Are there any consequences flowing for that in relation to the 3 alternatives LCA, NBA, NGT?
Ch	Will change the numbers slightly but the relativity will not change.
NC	APP135 - start "Programme entry, then conditional approval, then final approval - table after 5.1.11. We've got to programme entry?
Ch	Yes.
NC	Does 5.2.8 help what does Programme Entry signify?
Ch	Dept would expect to fund the scheme subject to the bullet points.
NC	At this stage would you be expected to be beyond the Programme Entry stage?
Ch	No - need to have proven the strategic case and its need. So by accepting Programme Entry, the Dept have signalled they were accepting the strategic need. Subsequent stages will develop further the commercial case for the scheme. Necessarily the commercial case affects the revenues and if those are affected they affect the economic and financial case. But it's not about redoing the economic case but updating and refreshing it as the data change because the Dept will already have accepted the economic case.
NC	Says an applcn can be made after any approvals. At 5.3.7 is that the point you are making? Requires in particular commercial aspects and procurement?
Ch	Correct.
NC	Then 5.4.5 - full details of bidders?
Ch	Only at the final stage will there be a preferred bidder and actual contract prices - the economic case will be refreshed with the actual contract prices.

NC	Your Proof page 18. Team you oversee resp for the derivation of a number of LTM inputs. We see here of partic inputs to First, your company developed assumptions about rationalisation of bus services, run times, quality specification?
Ch	Correct.
NC	And of course responsibility for the business case?
Ch	Also correct. Reason my team put those in the business case, is my team in 2009 were responsible both for demand forecasting and appraisal of the scheme. In 2010 the DfT asked that the forecasting migrate to the LTM but the promoters wanted continuity so we continued responsibility for those inputs and for the business case which is the nexus of the non-statutory elements that support the NGT (not ES and TWA application).
NC	C-4: Major scheme business case -was that prepared by your team?
Ch	Yes but taking on inputs from the promoters and the project engineers.
NC	In 2009 had Mr Hanson's input been obtained?
Ch	Not at that stage.
NC	And we get the "initial" programme entry letter. March 2010 you get C-6-8. One of the conditions was you must undertake a detailed update prior to conditional approval being sought. If this had gone ahead as planned, would you have had to do anything else so far as business case was concerned before TWA Order obtained?
Ch	No.
NC	New govt wanted to consider spending of public funds -we get "Best and final bid". DfT response C-6-13. 14th Dec 2011. Said insufficient to determine whether VfM but recognise a "strong strategic case" and invited Mtr to update business case info. A one-page letter but how much work is undertaken by DfT before giving this type of response?
Ch	Very significant work reviewing the business case and demand case- involve discussions before the application is made that frame the scope of the work, how the guidance in WebTAG is applied, then clarificatory questions which in itself could require further analytical work to answer- sheaves and sheaves of docs.
NC	When they say a strong strategic case what do they mean?
Ch	Strategic case accepted by the Dept and focus shifted to further work on the demand modelling.
NC	19th July 2012 letter. That gives programme -entry re-approval is it?
Ch	That captures it. Erm I think that's the phrase generally used.
	The work leading up to BafB and the work leading up to 2012 focused on the business case but it was important from promoters' perspective that they update the strategic case- recognised changes in the economy and imp to demonstrate a strategic case. Similarly, further financial work had been undertaken and changes in guidance. And in the commercial case the thinking had changed since 2009 and changes were made to the management case to reflect changes in thinking.
NC	Proof 3.22-23. You say, can't directly compare the VfM with the 2009 Business Case submission. Mr Alexander said no explanation why they cannot be compared is given. Is that the explanation?
Ch	Part of the explanation. Methodology has changed. Diff price base, diff values of time. Also a different option. In 2009, an NGT from Stourton to Bodington with an eastward extension to St James' hospital and a central loop, so materially different.
NC	Prof Bonsall asked about the level of rigour required at this stage. You've described the level at this stage and later you look at other aspects. Who are the right people to rigorously examine the business case?
Ch	The business case is rigorously examined by the DfT. They are happy provided the conditions are met. They apply the rigour appropriate to a £171m scheme.
NC	The relation to a TWA Order is what?
Ch	As I understand it, Promoters need to demonstrate that the scheme will be capable of being implemented and a clear explanation that there is a funding route is to my mind a clear indication that the Dept is minded to fund the scheme.
NC	Guide to TWA Procedure- "concern is to establish the scheme is reasonably capable to attract funds...rather than demonstrating that funding has been secured". 1.3.6 guidance?
Ch	It is- makes specific reference to "programme entry" - that is what is done in the July 2012 decision letter.
NC	C-4, table 3.7, 3-21. And in the business case review- are they the same objectives?
Ch	They are.
NC	C-4-10. Strategic fit technical note- explains what those were ?
Ch	We do.
NC	And C-1 -[?] a review of the strategic fit?
Ch	Yes.
NC	PoE 3.36 investigation of alternatives. You set out in short form the LCA and what they are. How and when were those alternatives elected and specified?
Ch	It's the Dept's reqt that we consider a "Next-best" and "low cost" alternative. SO were originally specified in the Oct 2009 business case but were refreshed and updated for the business case review.
NC	And a note dated 27th Oct 2009 by you?
Ch	Correct
NC	Done before or after the business case?
Ch	Dated contemporary with the business case but reporting on work done before. At request of DfT with whom we had discussed the specifications and set out the discussions we'd had with

	them.
NC	Mr Alexander in his rebuttal at 5.21 and 5.27 says you considered alternative technologies but not alternative corridors. But by the time you get to the "business case review" had the promoters received any endorsement of the strategic case for promoting a scheme on this corridor?
Ch	We have - the initial business case 2007, the letter C-6-2, did say "broadly content with the shape of the business case so far", so there was a req't to do further work to narrow it down to the final package and that involved looking at corridors and technologies. Mr Haskins referred to [C-4-2] the Public Transport for Leeds strategy that was produced in direct response to the letter from the Dept in July 2007. The technical work that sits behind it was discussed at length with DfT and the approach the promoters took was look at each corridor in turn and look at what they considered were the most appropriate interventions for those corridors. Identified that a number of corridors were suitable for PT. Narrowed down to 3 - north to Headingley, south and east to St James' hospital. And that was the subject of the 2009 application.
NC	C-5-1 page 32. DfT affirmation?
Ch	Yes- further evidence DfT involved throughout.
NC	2.2.7- who else were involved?
Ch	Says, "discussions with bus operator First Leeds to share initial ideas on route options".
NC	First bus company?
Ch	Correct.
NC	Appendix 6 of C-5-2, page 19. We see there set out the various options in the options sifting process?
Ch	Yes.
NC	So by the time you get to the business case review and Mr Alexander says why haven't you looked at other corridors, is it appropriate to do it again at that stage?
Ch	No.
MW	Before we break, I've had a look at what's been sent to DfT and I am concerned. It's giving the wrong impression and I would like an e-mail sent to correct the impression that that is the case.
NC	Can I suggest Sir, that a draft is prepared and submitted to the Inquiry for discussion.
MW	Might call into question my handling of this inquiry.
NC	We'll prepare a draft from the promoters saying this was in error.
MW	We'll adjourn for 15 mins [15:12hrs].
NC	Is it right to look at the whole VfM case or at the BCR?
Ch	You should look at the whole VfM case- all the impacts of the scheme.
NC	You say monetised costs and benefits assessed over a 60 year period. Why 60 years?
Ch	Is the period set by Treasury for Blue Book and that is carried through to WebTAG as the period for which transport infrastructure should be appraised.
NC	Where should we look at for the guidance references?
Ch	E-3-26, WebTAG Unit 3.5.4 Page 8. So for appraisal purposes the life is indefinite and it says at 5.2.3 that for these projects the appraisal period should end 60 years after the opening year. Important that the appraisal period not be Before 2003 appraisal period was 30 yrs but discount rate was [6%]. Now the period is extended to ensure that each additional pound cost at the end of the period has limited or negligible impact on which scheme to promote.
NC	NWLTF rebuttal, their rebuttal at page 15. And 8.4 - say the description of the "do minimum" is very brief and doesn't draw attention to some key assumptions..." Can we take up C-1-8? Page 7, section 2. If detail is required, is this where one finds it?
Ch	Correct
NC	Is this the specification for the purpose of the business case?
Ch	That's correct.
NC	You make the point in yr proof that it's not all the economic benefits that are captured in the cost-benefit appraisal. You refer to a report. Here, has, does the Urban Dynamic Model enable you to forecast benefits associated with NGT but not represented in the business case?
Ch	It does.
NC	C-1-18 is a report from your firm on wider economic impacts and Mr Hanson's confirmed that LTM is used for one part of the UDM?
Ch	Correct. Set out at para 3.126.
NC	When you say that if you included these the BCR would increase, is that the approach DfT would take?
Ch	DfT are interested in these and ask us to report these additional benefits and will take them into account in overall VfM even though they don't form an integral part of the WebTAG BCR.
NC	Now the March 2012 re-approval, Dept Response and Metro Response, can we follow that through? Take up C2 table 10.1, page 50. A BCR of 3.86. But we know that the Dept recalculated that, is that right?
Ch	That's correct - that's usual practice by the Dept - will look at a promoter's quantified BCR and from the work they undertake reviewing, make adjustments to that as they see fit.
NC	And here we see, C-6-15, DfT letter 19th July, second page, Roman (iii) - recalculated it to 2.7?
Ch	Correct.
NC	How much detailed work would DfT have had to have done to recalculate that?
Ch	Quite a considerable amount of work. As well as the document submission, they will ask any promoter for additional paperwork and additional model runs as they see fit. On the basis of that, if they consider there are any key risks about the BCR they are considered. This scheme

	was no differently treated.
NC	G-4-94. This was a letter from Mr Haskins of Metro to DfT. We can see, second page at the bottom, how the Dept came to its view the BCR was 2.7. Was there any discussion how they came to that conclusion?
Ch	There was indeed.
NC	There are details of refinements A-M. A correction from 2.96 to 2.90. In doing that have you made the adjustments made by the Dept?
Ch	Following a discussion with the Dept a number of developments and amendments to the LTM and key inputs were made specifically to address their concerns so that they would feel that no further adjustments were needed to BCR and the outputs reflected in my Proof would be considered a true reflection of the benefits of the scheme not requiring further amendment by the Dept.
NC	You referred to optimism bias -take up Mr Alexander's rebuttal. He says, 5.16, that significant bias, there's no detail about reasons for difference. What is the actual process that's been taken about optimism bias following the Dept's change to 2.7?
Ch	We have considered it and come to the view that there is no need to reassess the 2012 business case assumption. As you get closer and closer the optimism bias reduces. Following initial approval stage, optimism bias will be in low 20s percents and by the time of final approval will be low 10s percent. Adopting the previous optimism bias - 29% which is the mid-point between where we were then and where we will be in 18 months' time is seen as appropriate.
NC	NWLTF - they say you were 0.699 out from 2.7 and they say they'll apply it to the latest figure. Any validity to it?
Ch	No.
NC	They say at 8.29 query whether full account has been taken of delay to pedestrians on crossings. Has account been taken?
Ch	Yes account has been taken but fair to say that in Core Docs and PoEs that has not been fully documented. So as part of the response to OBJ147A cycling campaign we formalised the assessment on pedestrians and cyclists- Appdx 1 to the rebuttal to Leeds Cycling Campaign.
NC	A note produced by your firm that includes consider of impacts on pedestrians.
MW	We're not going to look at it?
NC	Can I just ask you to note it, Sir.
NC	Still on the preferred option. Got told off about asking Mr Hanson where it is, but Appendix 44 to Prof Todd's Statement of Case. What I'll do Sir is circulate that report.
GJ	Can I renew my request for more copies.
NC	So can we just go to Page 31, Graph 11. Seems to be a report on student housing. Just this bar chart. Students as % of local popn. Does this give an indication of proportion in 2007 and 2012?
Ch	It does - 2007 are blue bars and 2012 are red bars. What that shows is a mixture of increases and decreases but fundamentally doesn't seem to be a fundamental change in proportions of these areas.
NC	So Headingley - up a bit, Hyde Park up a bit, South Headingley down a bit.
Ch	There is a little more substantive change in the Uni and a substantial change in the City Centre where understand 6 or 7 thousand new student beds have been provided.
NC	Is there any dramatic change?
Ch	Not according to that data.
NC	Leaving aside reliability, does that suggest there needs to be any reappraisal?
Ch	No.
NC	At 3.128 of the Proof you refer to supporting regeneration and redevelopment, the last part: "the permanence of the system will be a notable contribution". We spent time on the permanence report. Which org produced it?
Ch	My firm
NC	C-1-12. And can you just...why was this produced?
Ch	Was produced because it was widely accepted that transport systems which have a degree of permanence have benefits not captured in the appraisal process. So the promoters were keen to know whether it had those characteristics of permanence. So the report looked at the characteristics of permanence, then the transport systems considered to have permanence and the attributes of NGT. It came to the conclusion that NGT would have attributes of permanence and would be possible to ascribe benefits to it.
NC	C1 Business Case Review. Table 5.1 on page 5-7. This has a summary of the options set out with more details in the text. On the LCA on the right hand side- has to be a correction?
Ch	Correct - says "articulated hybrid bus" but should be "standard double-deck".
NC	Correction made in the rebuttal to Prof Bonsall?
Ch	Correct.
NC	NBA - same as the preferred option in many attributes but the diffs we see are power supply?
Ch	Correct.
NC	So in terms of the options at C-1-16, the Mott MacDonald document.
Ch	They have stated that an articulated version of that vehicle will be available in the market by 2018. So while technically we cannot take that as the alternative but they are a reputable manufacturer and we can take it that it will be.
NC	In your proof you say that since completion of Business Case Review, further sensitivity tests done. With quality parameter halfway you assume an increase of quality halfway between what was assumed in business case and the preferred option?
Ch	Nearly right. Part of quality is stops Those are assumed to be the same. The other part is

	vehicles and it is there that we have come up with different assumptions.
NC	Then the next one is quality parameter equal to the NGT vehicle. Is that a practical alternative?
Ch	In ,my view it isn't. Because we consider the quality of the vehicles is associated with the electric drive train and the benefits that brings through smoother acceleration and deceleration, lower vibration, lower heat coming from the engine, lower noise. Those are valued by users. If the vehicle is operating part of the time on diesel operation, it won't have those benefits. A plug-in hybrid will be on electric half the time and so cannot possibly have the same benefits.
NC	I asked you about APP104. The figures changed. Can we just look at the consequences. What would the consequences be for the business case as it was submitted to DfT and in particular C2?
Ch	The preferred option still has a far superior economic performance to the LCA and there was no reason to change the conclusions at that point.
NC	You did some tests at 3.153 and 3.154 -have they been rerun with the adjusted quality factors?
Ch	No error associated with the South route - no error. The other tests have not been re-run because they would continue to have a worse performance and wouldn't shed any additional light on the matter.
NC	NWLTF at 8.36 of their rebuttal to you, responding to your 3.147. Say design and specification leaves a lot to be desired. Can you explain the journey times?
Ch	The assumptions assume that buses will enter the P&R sites directly in the LCA. That takes time. A trade off between a better P&R service and journey times. There will be a time penalty.
NC	C1 at 5.18 and the runtime report.
Ch	That's right.
NC	Prof Bonsall points out that para 5.1 referred to articulated bus when it should have been double-decker. At (NWLTF-118, his rebuttal to the rebuttal) he says a rerun is necessary. At 2.18.7. Is it?
Ch	No - it's simply a typo in the business case report.
NC	You say, in fact the case was assessed based on the appropriate vehicles?
Ch	Correct.
NC	Next question is modal shift assumptions. C1 at 12.4-12.8. We've the assumptions made, the preferred options, LCA and NBA. Now Mr Alexander in his Rebuttal 5.6 refers to this table in C-1-11 and Table 3.1 and he says the figures are inconsistent. A response to this in APP-125. Can you explain what happened?
Ch	As we set out in APP125 it's simply a question of correctly labelling the table in C-1-11 and in APP 125 we correct that.
NC	Let's turn to the financial case and impacts on bus operators. We know that at 3.42 of PoE there is an assumption as to bus operator reaction. Who was the source of that assumption?
Ch	Technically my firm was -but requires a little explanation. The 209 major scheme business case set out an assumption of rationalisation for bus services. That assumption was derived by my firm and incorporated in the business case at the request of the promoters. In arriving at that assumption we fully engaged the promoters in wider bus services team in Metro and the consultancy team. We were asked to come up with an assumption. Put to the client for their ratification and that was ratified and put into the business case in 2009. The revised business case in 2012 is different subtly. Reflects changes to bus services in Headingley over the 5 year period. And we were asked to review the assumption. Process was similar- asked to produce an assumption for ratification by the client and once it was ratified it was put into the business case review.
NC	Set out in business case review?
Ch	That's right, in chapter 21.
NC	It's put to Mr Henkel that parallel routes were not included. Was impact on parallel routes modelled at all?
Ch	Within the LTM changes in bus demand across Leeds is modelled, so all routes. As part of the review of the assumption in the business case review, the assumptions were reviewed. And rewinding back to 209 there was consideration of parallel bus routes because that model did not have the same comprehensive coverage of bus routes as LTM does.
NC	Mr Alexander refers to para 3.80 of your proof and says you've got the length of the bus routes wrong. You have produced a note today which responds to that point -APP133. Is he right and if he is, what are the consequences?
CH	He is right and we have understated the cost savings that would arise from the rationalisation. So it is an upside in the cost-benefit analysis which was already strong. We have not carried it through into the BCR.
NC	They lose revenues but fewer operating costs.
Ch	Won't increase it a lot. A very small change.
NC	Would carry though into Table 17.1?
Ch	Correct.
NC	Let's take up Mr Cheek's rebuttal at 3.3. He says, you've assumed savings but operators need not make any cuts at all. But if we go to Table 17.9 do we there have a sensitivity tests that assumes they don't make cuts and continue as before?
Ch	Correct - that's what that test considers.
NC	Alexander impacts on road users -rebuttal 5.4. He says at 5.7 there's been a change in net disbenefits to all road users and more explanation is required. What's the difference?
Ch	We've already taken up the letter to Charlie Sunderland at DfT -G-4-94 of March this year. Third page and points A and B. As it says, substantial work has been done to refine

	interaction with traffic. Belle Isle interaction with Junction 7 of M62 and also the corridor in the University has segregated traffic and again a positive impact on traffic. And with Mr Robertson and his team work has been done contributed to reduce negative impact so that in present value terms the negative impact has been virtually eliminated.
NC	On trolley vehicles, a discrepancy between C-1-10 para 2.28 and Mr Henkel. Who's right?
Ch	The C-1-10 is correct. I owe Mr Henkel an apology as he asked me to fact-check his proof. Are 18 vehicles in operation between 7 and 9 and 2 spare vehicles in the depot.
NC	Are they sufficient for that service?
Ch	They are.
NC	Table 21.1 "typical mature year of operation out-turn" Mr Cheek's response is Tab 2 and appendix to his proof called "operating cost audit". Then a rebuttal to Mr Cheek at 2.74-2.76. You say even if you take Mr Cheek's costs there isn't a significant effect on BCR?
Ch	That's correct.
NC	Take Mr Cheek's supplementary rebuttal FWY-119. And he goes through Tabl 6 on Page 7- assessment of labour costs. And APP-128. Can you tell us hat APP128 is and what concs if any you raw from it?
Ch	In APP-128 we look at Mr Cheek's supplementary rebuttal and come to the view hat principal diffs are hours of operation of NGT and the staff complement. Our assumptions are set out and we see no reason to change them. If we use our own assumptions on operating hours and staff complement there is virtually no difference between Mr Cheek's operating costs and our own. Top line is Mr Cheek's calculations and the bottom are ours. Are driven by the operating hours and level of service in those hours.
NC	Want to check smth in Mr Cheek's appendix. [16:37]. Don't need t look at that.... Can we go to LTF Rebuttal at 8.41. Refer to Sheffield and say the outcome was not as planned. Are there any relevant comparisons to be drawn from Sheffield Tram?
Ch	I don't consider there are any relevant lessons- development assumptions were proven to be very optimistic as promoters were assuming developments would come forward that did not. Changes to guidance make that impossible now. Didn't take into account opening of Meadowhall shopping centre in centre of Sheffield. Not the same as Leeds. Fare levels and structure not competitive with alternative modes. Widespread problems with ticketing machines and didn't know how many people were using them. And P&R was not delivered, only in phases. And public transport in Sheffield was in turmoil with bus wars - very vigorous competition between operators. Also, lessons were taken forward into guidance to prevent that occurring again.
NC	Page 21-3. Operating assumptions. We see a risk reduction of 20% has been made -say that's a prudent approach. Can you just explain, first of all, what is the basis for that 20% figure?
Ch	That figure is based on essentially established practice for schemes at this stage of development. As we move to conditional approval further work will be done. Based on precedent and practice and anticipates the sort of reductions from the detailed work that can only follow the grant of TWA consent.
NC	It's been argued further work should have been done on impact of lower bus fares. Has that been considered?
Ch	Has been considered and decision made it was not necessary at this stage although as we move towards final approval that would be something that would be undertaken. C-6-15 page 3, condition 14. It doesn't say it in the letter but our understanding is that it applies oth to fares assumptions on the scheme being promoted and on other modes in the corridor.
NC	Is this the right time to do it?
Ch	No, I consider I've done all that is required at this stage for the business case.
NC	We'll move on. I'd like to take a point on monetising impacts. Various parties make the point that no monetised consideration of construction impacts. Is it normal to seek to monetise construction impacts on these types of projects?
Ch	No
NC	Is there any exception in this case that suggests you should do it?
Ch	No.
NC	APP-103, question 6. Page 3. What was asked for was a calculation of the costs of disruption in construction. You say, he construction programme is insufficiently developed. You refer to Manchester inquiry- was the point raised there?
Ch	It was - objectors suggested it should be taken into account.
NC	Dealt with in your rebuttal to Mr Alexander?
Ch	It is.
NC	Runtime assessment C-1-13. And 1.4, what does that tell us?
Ch	Based on Design Freeze 7, which is the subject of the application.
NC	Question asked of Mr Smith by Mr Broadbent- whether the assessment takes account of narrow bus lanes at Lanewood?
Ch	It does, run speeds are based on the geometry of bus lanes.
NC	Does it take account of time for buses to exit lay-bys.
Ch	The design is to minimise interaction between buses and NGT. It assumes a level of interaction with buses and cyclists, the maximum speed.
NC	Now the derivation of the run time estimate. A specific question on C-1-3 page [16:51], whether an adjustment of runtimes over the life of the project for NGT?
Ch	No. Because the design of the system is to guarantee those runtimes. Half is segregated. Only interaction with general traffic is non-segregated sections. From provision of lanes and traffic signals, impacts will be insulated from congestion and Mr Smith's traffic signals will ensure that there is no impact. So there is absolutely no need to link it to the congestion on the highway and would be wrong o do so as not reproducing the characteristics of the NGT in the future. Furthermore it is giving priority to buses which is there to insulate buses from

	congestion. So if we had a feedback from congestion we'd be saying that no system of bus priority in Lees could work which is clearly nonsense. The whole purpose is to insulate the run times from congestion.
NC	Page C-1-3 pp.29-30 a formula is set out with a definition for "th". It was suggested that this should be an input and there should be some element of allowance for congestion. Does that make you change your mind?
Ch	Not at all If buses or NGT were operating in general traffic with no priority it would be appropriate but to incorporate that term in the formula would not be appropriate.
NC	Now, on shared spaces. Take scenario 0402, tables at back of C-1-13. Top of table says Scheme Design Freeze 7 and Option 0402. North line southbound, AM, 2016. If you take the numbers 19 and 20 (from Univ NGT stop to Leeds Met NGT stop) and loom at average speed, does that give us the runtime assumption on that shared space?
Ch	It does.
NC	And assumed average speed 15.5 btwn Leeds Uni and Leeds Met. It's been suggested there would be some advantage in reducing max speeds to 10mph from 20mph. What impacts would that have?
Ch	Some impact but relatively small. Reduce from 15.5 to 12 mph would be 18 seconds difference. Doesn't mean a reason to reduce the speed just because there is no impact on the business case. My view is that the assumptions were appropriate.
NC	Would the NBA also be subject to the same adjustment?
Ch	Yes, exactly the same.
NC	We'll need to cover quality factors and generalised journey time, which will take a little bit of time. Then other LTM inputs, some other small points on Merseyside and interchange and interrelation. Is now a good time to break?
MW	It is. To remind you, there are still, some outstanding docs. There is a list of them.
NC	Is it possible if you list comes to us through the programme officer?
MW	Yes there's about 5 for me and that e-mail now. I'll adjourn till 10 o'clock tomorrow.