1. Defendant
2. M. Allen
3. First
4. 12 April 2017

IN THE MATTER OF PART D OF THE NETWORK CODE

AND IN THE MATTER OF THE ACCESS DISPUTE RESOLUTION RULES

AND IN THE MATTER OF TIMETABLING DISPUTES TTP 1064; 1065; 1066; 1069; 1071; 1073; 1075

BETWEEN

(1) ABELLIO SCOTRAIL LIMITED ("ASR")
(2) DB CARGO (UK) LIMITED ("DBC")
(3) FIRST GREATER WESTERN LIMITED ("GWR")
(4) XC TRAINS LIMITED ("XCTL")
(5) GB RAILFREIGHT LIMITED ("GBRF")
(6) ARRIVA RAIL NORTH LIMITED ("ARN")
(7) EAST COAST MAIN LINE COMPANY LIMITED ("VTEC")

Claimants

and

NETWORK RAIL INFRASTRUCTURE LTD

Defendant

NR's RESPONSE TO HEADS A AND B ISSUES
APPENDIX 1:
WITNESS STATEMENT OF MATTHEW ALLEN

I, **MATTHEW ALLEN** of NETWORK RAIL INFRASTRUCTURE LTD, of The Quadrant, MK Elder Gate, Milton Keynes MK9 1EN WILL SAY AS FOLLOWS:

1. I am the Head of Timetable Production within the Capacity Planning Team at Network Rail (*"NR"*). Subject to the overall responsibility of Fiona Dolman, the Director of the Capacity Planning Team, I am responsible for NR's implementation of the network timetable, including the revisions to the Timetable Planning Rules (the *"TPRs"* or the *"Rules"*).

2. I have worked within the rail industry for over 26 years, commencing as a Railway Trainee in 1990, holding a number of positions at both managerial and then leadership level with regional and now national levels of responsibility. From May 2014 to June 2016 I was Head of the Capacity Planning Controls Team, leading on continuous improvement projects including aspects of the *'TRIP'* program described below. From June 2016 I have been the Head of Timetable Production, in which, amongst other things, I lead the design and production of the working timetable and the implementation of improvement project outputs by the capacity planning controls team.

3. I make this witness statement on behalf of NR in response to the notices of dispute issued by the operators identified above in connection with the ongoing revision of Timetable Planning Rules pursuant to part 2.2 of Part D of the Network Code, and pursuant to the directions of the Hearing Chair made in these proceedings on 31 March 2017.

4. In so far as the facts and matters referred to in this witness statement are within my own knowledge, they are true. Where they are not, they are true to the best of my knowledge, information and belief. If I have relied on information obtained by me from another person, I have identified that person and, if obtained by me from reading a document, I have identified that document.

5. In this witness statement, I summarise the Timetable Rules Improvement Programme (*"TRIP"*) and its impact on the current revision of the Rules, including the revisions which are the subject of appeal in these proceedings. In particular, I explain how the Observed Data Analytics (or *"ODA"*) tool has been developed and used by NR to analyse large amounts of real-world data taken automatically from the network, how the data utilised within ODA has already been used for several aspects of the rail network's operation, including safety issues, and ODA analysis is now informing many of the proposed changes to the Rules. I also explain how NR has consulted with operators both prior to, and during, the Part D 2.2 process under the Network Code.

6. The ongoing reform of railway performance, including the revision of the Rules which are the subject of these appeals, will bring substantial shared benefits to the industry. In at least some cases, however, they will also involve substantial short-term impact. In that context, appeals by individual operators to certain TPR changes affecting their services – although only relating to a small fraction of those proposed by NR – are perhaps unsurprising. However, as I explain below, the preferences of individual operators ought not to be allowed to stop the implementation of what the industry has acknowledged are challenging but necessary improvements for railway performance, resulting from the implementation of a carefully considered and widely consulted programme.

Timetable Rules Improvement Programme ("TRIP")

7. TRIP is a programme developed in 2014 under the auspices of the National Task Force.

8. The National Task Force is the body which brings together passenger and freight operators, NR, the Office of Rail and Road, and the Department for Transport, to work towards our mutual goal of improving performance on the railway. All owning groups (of operators) are represented at a senior level, and the National Task Force currently includes over 10 operator representatives and is currently chaired by the Managing Director of GWR. I say this to re-emphasise that TRIP is not an NR initiative imposed on operators, or even an initiative imposed by the Department for Transport or Office of Rail and Road on both NR and the operators. Rather, it is part of a collaborative, long-term, industry-led reform programme.

9. I summarise the development and implementation of TRIP below.

10. The National Task Force has three key themes – better operations, better assets, and better timetables. Recognising the need for improvement in train service performance across the national rail network, in November 2012 the National Task Force commissioned the Performance Planning Reform Programme.

11. TRIP is Stage 2 of that Programme. Stage 1 involved developing a uniform framework for performance improvement planning, including tools and governance. This included a public performance measure ("*PPM*") attrition tool. PPM attrition is the term used for any reduction in performance from 100% PPM; that is, from 100% of train services arriving at their terminating station within five minutes for commuter services and within 10 minutes for long distance services. The current moving annual average for national PPM (from 5 March 2016 to 31 March 2017) is 87.6% **(Annex / File 1 / Tab 3 / 135-136)**.

12. Developing this framework involved demarcating six causes of delay, which are recognised across the industry as together making up all incidents of loss of PPM across the network. Put simply, whenever a train is late, it is because of one or more of these six causes. The largest of the six key causes of delay is known as specification error; that is, delay associated with the way the rail timetable is created and then operated. The other five causes are reactionary delay (knock-on effects of one failure which then causes others), primary delay (reliability of assets, including both the railway and rolling stock), seasonality (delay caused by *'ordinary'* weather), severe weather (delay caused by weather beyond the assets' design capabilities), and extreme days (*'one-off'* delay events of great impact). Since specification error is the largest cause of delay, it follows that it is also likely to cause a significant amount of reactionary delay.

13. Of particular concern within specification error were incidents of delay of less than three minutes. These are incidents below the threshold at which *'delays'* are measured and attributed to a primary cause, but which prevent services from operating as timetabled. For example, if a journey from station A to station B is timetabled to take five minutes but in fact takes six minutes, this will not register as a delay incident – and a one minute delay, if it is a one-off, will rarely prove significant. But when a trip routinely takes longer than is timetabled – and especially when the cumulative effect of these minor delays is that a journey from station A to (for example) station G is timetabled to take 30 minutes but in fact routinely takes 36 minutes, this causes widespread inconvenience and inefficiency. Indeed, even say a four and half minute delay (which would not impact PPM statistics) is likely at least to frustrate commuters if a service is unable routinely to meet its scheduled timetable. Amongst other things, late services affect: passengers' ability to plan their commutes to and from work and other appointments and to access connecting services; the availability of the rail network to other services and to other operators; and operators' ability to plan staff and rolling stock changeover.

14. The National Task Force considered that there was significant benefit in seeking to address this category of delay, and in July 2014 TRIP began systematically to review the industry TPRs (the Timetable Planning Rules).

15. TRIP focuses on reviewing and improving the accuracy of the building blocks upon which the timetable was built – namely the TPRs. Its aim, supported by all of the operators, is to make a step change towards a zero-defect timetable. Any level of delay is undesirable, and although some level is probably inevitable in the real-world, everyone involved in the rail network must constantly strive to reduce delays and their impact since current levels are not acceptable. An essential part of that drive is producing timetables that are accurate and realistic. TRIP has been funded and delivered by NR, at a current cost of £11.6m, but has at all times been monitored and governed by the National Task Force. This involves regular check-ins and reports to the National Task Force.

16. The origin of what became TRIP is set out in a NR working paper to the National Task Force Operators' Group dated 11 October 2013, which notes the establishment of a working group containing operator representatives in order to resolve "*inconsistencies and a lack of process for determining the Timetable Planning Rule*s". It noted that "*Where modelling tools are required to do this we will identify and agree the best toolset*" and that "*Modern signalling and rolling stock systems have the ability to provide valuable data for use in the calculation and maintenance of TPRs. We will work with the industry to find ways of unlocking this information and determine where data can be sourced automatically to generate the technical planning values and to provide objective information to support changes to the TPRs*" **(Annex / File 1 / Tab 2 / 102-104, Annex / File 1 / Tab 3 / 137-138).**

17. From the outset it was apparent that TRIP envisaged the use and application of both theoretical (modelled) data, and real-world data sourced from the rail network.

18. As at 14 November 2016, following the involvement of over 200 people within the rail industry and 74 cross-industry forums, using the TRIP methodology operators had validated changes to 1,487 rules, suggesting that approximately 20% of the 7,700 rules reviewed through the TRIP process required improvement. Over 70% of those recommendations have been increases to the previously planned timings (53% for sectional running times) **(Annex / File 1 / Tab 2 / 111)**.

19. In V1 of these Rules for the 2018 timetable year, NR proposed approximately 6,600 TPR revisions. Following consultation, approximately 250 were amended and re-proposed, and approximately 400 withdrawn. Of the approximately 6,200 TPR revisions now included in V2, approximately 250 (4%) have been appealed by one of the Claimants in some way and are the subject of these proceedings. 29 of the 36 operators have now accepted these revisions in full. Even within the seven operators who still appeal proposed revisions in some way, the majority of those operators have also, in parallel, agreed to many the

proposed revisions which affect them, including revisions informed by using the TRIP methodology.

TRIP Innovations

20. TRIP involved (and involves) three key innovations in how the TPRs are reviewed and determined. First, greater industry engagement. Second, collating data for use in modelling the railway. Third, the effective use of real-world data through technology.

21. First, as to industry engagement. Implementing TRIP would require consultation with and buy-in from the industry. That engagement has been present since the outset from operator representatives at the National Task Force level. As described below under the heading *'Consultation with Operators'*, it has also been built through many years of consultation at the local level.

22. Second, as to modelling:

22.1 When built and applied to a specific area of the network, models of the railway provide a theoretical analysis of the operation of the network in that area. Models which provide analysis as part of TRIP include VISION and TIP. Detailed explanation of these models and the modelling process (the framework of which was agreed as early as 2013) has been provided to operators **(Annex / File 1 / Tab 3 / 139-144)**. Explanation of that process is typically repeated, either within the report itself or as an appendix, with the results of model-based analyses relating to an operator's geography or operation.

22.2 The key advantage of a model is that it enables NR to predict the effect of changes on the network - including changes to infrastructure, rolling stock, driving policy, and (critically for the TPR review process) TPR values. This enables greater understanding of the (theoretical) effect of changes to the timetable, and where utilised has substantially improved the quality of our insight into the proposed changes to the TPR.

22.3 Any model, even a very detailed one, is a simplification of reality. To give one example, no model currently utilised by NR is capable of fully accounting, within the model itself, for the effects of drivers exhibiting caution when operating the train. The outputs of models are sense-checked against observed/real-world data (where available – obviously real-world data is not available for the effect of a modelled change, such as, say, use of a new type of rolling stock) and experience, and only then utilised to drive changes to NR's planning and processes. Models have been used by NR in various ways for more than ten years, and following a successful case study of the use of theoretical models in the TPR review process on the Brighton Mainline in 2014-2015, have been extended to the TPR review process across the network.

22.4 NR identified particular priority areas of geography for modelling, and those models then informed changes to subsequent revisions of the TPRs. In this revision, modelling has informed changes to TPRs across all eight NR routes.

23. Third, as to the use of observed/real-world data*:*

23.1 From the outset of TRIP, as noted in the working paper to the National Task Force of October 2013, it was apparent there was great potential for NR more effectively to use observed/real-world data (as opposed to theoretical/modelled data), already available from the rail network, to analyse existing train movements.

23.2 However, it was not possible to make effective use of this data with the tools available to NR in 2013. This led to NR commissioning the development of the ODA tool, produced jointly with Deloitte. The purpose of the ODA tool was to facilitate NR reviewing large amounts of data, from a series of feeds, within a single accessible database.

23.3 Developing the ODA tool took some time, but it was first shown in its development stage to operators during July 2015 **(Annex / File 1 / Tab 3 / 166-190)**, when NR outlined the data sources and proposed analytics of ODA. ODA featured in estimates of the benefits in improving PPM in an update to the National Task Force from October 2015. The first ODA analyses were completed in December 2015, and some 25 analyses have now been completed **(Annex / File 1 / Tab 2 / 126)**, with more to come.

23.4 ODA is not a model in the same sense as the theoretical models listed above. Theoretical modelling is helpful in understanding the operation of the railway, and its potential future operation following changes which can be put into the model. ODA, on the other hand, synthesises multiple sources of data from real-world operations and actual train movements. Theoretical modelling is a core part of the overall TRIP process, but it is not (and was never envisaged) as the only way to gain insight as to timetable operation, whether within TRIP or otherwise. In addition, theoretical models require time and investment to build, and can only be applied to limited geography at any given time. In contrast, ODA allows analysts within NR to review historic train data more quickly - the results of ODA take weeks, whereas the results of theoretical models take months.

24. The ODA tool itself is powerful: it is possible to analyse headways, sectional running times (*"SRTs"*) and dwell times. These can be searched based on location, time, service type and train type parameters. All the data can be analysed using Tableau (a computer program which visualises data) or Excel. This automates what was previously a laborious process of manual calculations and filtering, allowing more time for actual analysis of the data.

25. Both theoretical model-based analyses and observed data / ODA-based analyses are independent of the other. Although the approaches are complementary in the sense that they are different ways of informing decision making on revisions to the Rules, it is not the case that one is needed as a check on the other. Mindful of NR's objective of sharing capacity on the whole railway network in the overall interest of all users, and of the finite resources available, NR has prioritised applying ODA analysis to those areas that had not previously received a model-based analysis (and where data is available to facilitate ODA analysis).

26. While certain recommendations derived from theoretical model-based analysis are challenged by some operators in these appeals, theoretical models are not the subject of attack (as a tool of analysis) in the same manner as ODA. For example, although in its sole reference document GB Railfreight has queried the outputs of VISION signalling performance assessments (the detail of which will be addressed at the appropriate point in NR's response), it is generally supportive of the use of VISION as a tool.

27. Accordingly, I now turn to explain the ODA tool and its use in more detail.

Observed Data / ODA Analysis

28. ODA is an analysis tool. It utilises a database that is built from, and makes accessible, large amounts of observed / real-world data taken from across the rail network.

The Database within ODA

29. The database used within the ODA tool has two key advantages when compared with previous practice in the use of real-world data in the TPR process.

30. First, its database uses existing inputs and data harvested from the rail network, so there is a huge amount of data to draw from – literally more than nine billion data records, taken over many years and from millions of observations across the network. As with any data set, the larger the sample size, the more representative of reality the sample can be expected to be.

31. The inputs within ODA's database contrast to the past use of real-world data in the TPR review process, which typically involved manually gathering data specifically for the purpose of the TPR process, often through stopwatch timing. While stopwatch timing can give accurate results for the specific run measured, it is time consuming, labour intensive, and generates only a small sample size. It is logistically impossible for NR to undertake this exercise on a sufficient number of services, over different days and at different times of year, to obtain a large enough sample size for a robust set of data.

32. Second, it allows NR to synthesise a number of different sources of data within a single database, all of which can then be assessed together as part of the TPR review process.

33. The following data sources are combined within, and form part of, ODA's database:

33.1 The Working Timetable ("*WTT*"). The WTT is the train timetable of all planned/scheduled services for a defined period. It is traction and service specific.

33.2 The Train Describer feed ("*TD feed*"). The TD feed provides data on train movements passing specific signals on the network. Because it is taken from every service, the TD feed data is service specific. As the data is linked to the signalling system (which is critical to safe operation of the railways and so the data's accuracy is critical), it is a robust source of data for analysis. Further, as the TD feed is directly linked to physical attributes on the

network, it tends to have a greater level of accuracy than GPS data, which can give inaccurate readings due to recording points. It is also more granular as it can pinpoint a train to a specific line on the network, which often cannot be achieved with GPS.

33.3 SMART. SMART contains berth offset data:

33.3.1 The need for SMART and the berth offset data it contains is a function of the location of data points on the network. In an ideal world our analysts would be able to access data from an infinite number of data points around the network, including those directly at stations and any other point NR wished to measure to and from, but we must work with the data points available under the current infrastructure, which are at signals.

33.3.2 SMART contains agreed values for the time which a service takes to travel from a signal, the data point from the TD feed, to a timing point location or *"TIPLOC"* (typically stations). This allows NR (and indeed anyone using it) to interpret the TD feed in a meaningful way, by converting that data into arrival or departure times at stations. If at any time an operator (or indeed NR) wishes to effect a change to this agreed value within SMART, there is a mechanism for doing so. There is also an audit conducted every 12 months to consider whether any changes might affect the accuracy of a specific value in the system.

33.3.3 Moreover, like all of the other data sources within the ODA database, SMART berth values are already used outside of the TPR process (as I explain in paragraphs 34 to 35 below).

33.3.4 Accordingly, comments made in the appeals by GB Railfreight and Virgin Trains critical of the use of berth offsets because they are (they assert) insufficiently reliable appear somewhat contrary to both operators ongoing acceptance of those values in other contexts.

33.3.5 With that said, where operators' concerns relate to specific berth offsets which they consider inaccurate, NR has and will continue to discuss these concerns with operators, as part of its informal and formal consultation process under the Rules as explained below. However, where an objection is simply to the use of SMART data *per se*, in my view the objection has more to do with the planning value produced than the methodology by which it is reached.

33.3.6 Although the issue does not relate to any of the changes the subject of appeal, I mention that in areas where SMART's agreed berth offsets are not available, offsets may be calculated, or a secondary observed data set is sourced in order to provide the missing values. This is only ever a supplementary basis of obtaining berth values, however – and where a large number of berth offsets

are not available via SMART, NR would generally not proceed with an ODA analysis of the TPRs in question.

33.4 NETRAFF – train formation data. This measures the tonnage of trains that run on the network – this data is primarily used for billing in relation to use on the network. By including this data we can tell the weight of the service that actually ran, and so identify the traction used, which may differ from the type or weight of train planned in the WTT.

33.5 The database also indicates whether a service met the PPM pass/fail threshold (services arriving at their terminating station within five minutes for commuter services and within 10 minutes for long distance services), and the existing planned values. This has been used by NR to identify priority areas of focus for TRIP, and the benefits that could be expected to arise from improving PPM attrition rates.

33.6 In summary, the database within ODA contains the planned timetable (the WTT), raw data taken directly from the railway (the TD feed, NETRAFF), agreed offsets that let NR interpret that raw data (SMART), historic performance, and existing planned values. The database contains data from each of these sources from the start of the December 2013 timetable, and is updated every four weeks.

33.7 The above datasets are available for all areas where the TD feed is available, which covers around 95% of all train movements, and all of the relevant revisions supported by ODA analysis which are the subject of appeal in this TPR process.

33.8 I should note that each of the above data sources is made available to the industry at no charge. None, as far as I am aware, is the subject of any challenge as to its accuracy.

34. Outside of the Rules review process, each of the above data sets is used for, amongst other things:

34.1 (in the case of the TD feed) the safe operation of the network;

34.2 (in the case of NETRAFF) charges levied for the use of the rail network; and

34.3 (in the case of all four data sets) PPM, which as already indicated measures the punctuality and reliability of passenger services across the network. The PPM is of course critical to both NR and the operators' relationship with the Office of Rail and Road – it affects, amongst other things, operators' ability to retain franchises, and the contractual penalties or incentives paid under existing operator contracts. Operators therefore have a vested financial interest in the quality of data sources utilised within ODA's database.

35. All of this is to say that given the many existing applications of the data within the ODA database, it would be surprising, and indeed concerning, if operators considered that such data, which was accurate and reliable enough for the above purposes, was insufficiently accurate or reliable to be used in reviewing the Rules. The operators' expressed concerns

do not seem to be with the data in question but rather with the product of analysis of that data.

Headway and SRT Data

36. As I explained in paragraph 24 above, using the ODA tool it is possible to analyse headways, SRTs, and dwell times. Data can be filtered for location, time, service type and train type.

37. SRT stands for Sectional Running Time. An observed SRT from ODA is the time taken for a train to go from TIPLOC A to TIPLOC B, with data taken from the TD feed, as then adjusted to account for the distance between the TIPLOC and the physical signal itself. This adjusts data from a signal to signal time to a TIPLOC to TIPLOC time. As I have said above, in an ideal world NR would of course take data from a data point at the exact point of the TIPLOC, and indeed from an infinite number of data points around the network, but that is not possible given current infrastructure on the network. This adjustment provides a robust figure which is widely used and relied upon within the industry.

38. The sum of all of the individual SRTs on a route/journey is the total time for the route/journey.

39. Headway is the amount of time between trains. For obvious safety reasons, drivers must maintain a safe distance between trains when in operation. This, amongst other things, is maintained through signals along the track, which are operated centrally and sighted by the driver. The UK signalling system generally uses three levels: (i) green / proceed normally; (ii) yellow / proceed with caution, indicating the driver needs to prepare to stop the train at the next signal; and (iii) red / stop. (There may be multiple levels of 'yellow' signal, for example double yellow and single yellow, depending on the number of signal aspects used at that point in the network). Headways are planned with the aim of facilitating each service's operation not being restricted by the train ahead of it: that is, in normal operation, each train will receive a green signal.

40. ODA calculates headway data by measuring the minimum time for the front of the train to move from a green to red signal. This is the time it takes to pass either three or four individual signals, depending on the type of signalling in the area. This produces the technical (or theoretical) minimum signal reset time, or 'technical headway'.

41. However, the following train's safe progress does not depend on the front of the train ahead, but its rear. So, to account for the length of a train, the headway is taken from when the train reaches the next (fourth/fifth) signal, by which time it can be safely assumed that its rear will have passed the previous (third/fourth) signal. This data is taken as the 'nominal headway' or 'planning headway', and the appropriate nominal/planning headway value (see below) from the dataset can be used in considering planning values in the TPRs. The planning headway also allows for three factors which in reality increase the minimum safe signal reset time - (i) the distance between the TIPLOC and the physical signal itself; (ii)

the signalling response time; and (iii) the signal sighting time for the driver - none of which are accounted for in the technical headway value in ODA.

42. Each ODA Report contains a section which explains, in summary form, the ODA methodology for measuring both SRTs and headway **(Annex / File 1 / Tab 3 / 145-147)**. This methodology was also explained to operators in familiarisation presentations to the operators: see, for example, the presentation of 11 February 2016 provided to the LNE TPR Forum **(Annex / File 1 / Tab 3 / 148-162)**.

Deriving Planning Values from Database

43. I have explained above the data sets used, and what they measure. I explain below how that data is used to derive planning values for SRT and Headway.

SRTs

44. Observed SRTs from ODA are measured, via the TD feed, to the nearest second. For the majority of timetables under consideration, the database contains many thousands of journeys, with each journey having its own recorded SRT for each segment of that journey. There is, accordingly, a wide distribution in the recorded SRTs, due to the varying performance of trains on the network (from a perfect or near-perfect run, through to the seriously delayed).

45. In reviewing SRTs for the purpose of the Rules, section 6.4 of the TPRs relevantly provides the following guidance:

> *"6.4.11 SRTs should not be so generous that trains run and arrive early, having an adverse impact on performance, safety and capacity.*
>
> *6.4.12 SRTs should allow for reasonable variations in operational performance. SRT calculations based on observed data should not be standardised on the lowest observed value as this will embed optimism bias*."

46. So, in assessing the SRT dataset for a given run, NR cannot select the fastest recorded time in the data set - this would entrench optimism bias, produce a figure that will not be regularly achieved in reality, and result in a poorly performing timetable. The value selected is required to allow for some variance within train performance that cannot be avoided due to, for example, variations in driver behaviour. Equally it should not allow for too much variation – making too great an allowance would result in values that do not take account of the actual capacity on the section, and a slower timetable than necessary.

47. Through reviewing the data distribution of observed running time data from ODA, NR has identified through statistical analysis that the 25th percentile of the data will generally produce a value representative of a well-performing train as this percentile removes the bias in the data that is created by poorly-performing services.

48. As Head of Timetable Production I am familiar with the ODA tool's methodology and the statistical analysis through which its results are interpreted. The detail of the distribution of the SRT dataset and its analysis is explained in a document produced by my colleague, Ms Charlotte Heron, who is the Project Manager for TRIP and has had primary oversight of the ODA program **(Annex / File 1 / Tab 3 / 163-165)**.

49. In short, however, SRT data is not distributed evenly because the majority of trains perform more-or-less well, and a smaller number perform poorly (albeit in some cases very poorly). This means that using the mean/average SRT from all the records, or using the median/50th percentile SRT from all the records, would produce an artificially slow figure for the purpose of a realistic planning value. The 25th percentile, on the other hand, avoids skew from outlying datasets, and represents an ordinarily well-performing train. As part of the internal and external consultation and review process described below, NR considers whether there is a reason to apply a different percentile of the dataset, but has not yet departed from the view that the 25th percentile for SRTs is the most appropriate value to adopt.

50. In accordance with section 6.4 of the National Timetable Planning Rules, SRTs are then rounded to the nearest half-minute for planning purposes. For SRTs for a journey as a whole, the sum of each SRT is rounded to the nearest half-minute only cumulatively, to ensure that the planning value for the journey is no more than 15 seconds outside the technical value produced. This is because individual SRT values are not planned in isolation, but in the context of the route. To give a simple example, without context, three successive SRTs of 2 minutes 12 seconds, 3 minutes 6 seconds, and 4 minutes 12 seconds would be rounded to 2 minutes, 3 minutes and 4 minutes respectively. In context of those three SRTs following one another in a journey, however, one of those SRTs would be rounded up, to give a more accurate SRT for the journey of 9 minutes 30 seconds as opposed to 9 minutes. This approach to rounding has (as best I am aware) been industry practice for decades – I cannot recall a different practice in my more than 25-year career.

Headway

51. As with SRTs, headways are also measured to the nearest second, and there is a wide distribution of results within the dataset. Here, because with a headway planning value NR is more concerned with the technical capability of the rolling stock and infrastructure being analysed than with observed results, the 15th percentile of the planning headway (explained above) is taken, to which a performance uplift is applied to produce a planning value. The 15th percentile of headway results closely aligns to modelling outputs for technical values.

52. The reason why planning values for headway utilises the 15th percentile and applies a performance uplift, whereas planning values for SRT utilise the 25th percentile with no performance uplift, is that the values have different purposes:

52.1 SRTs are based on the capability of the train to travel from point A to point B. Planning values need to account for some variation from technical capability, as if a technical capability is used the timetable will be thrown out whenever a train (inevitably) does not achieve its technical capability. The purpose of observed data for SRTs (in many ways the most fundamental part of the Rules) is that they should not vary according to other factors such as variable traffic on the lines. The 25th percentile of observed data achieves this.

52.2 Headway, on the other hand, is designed to keep sufficient distance between trains such that one train does not cause another to suffer a restricted aspect. A performance uplift is then applied, which is appropriate to the mix of traffic on the line of route (and varies according to that traffic), to ensure the timetable is resilient (to some degree) to individual delays. The appropriate starting point, before applying that uplift, is a technical value. The 15th percentile of observed data achieves this.

53. Again, in accordance with section 6.5 of the National Timetable Planning Rules, this planning value for headway is rounded to the nearest half-minute, which again has been the practice for rounding for, as best I am aware, the whole of my career.

Use of Analysis Tools in Proposing Revisions to TPRs

54. Certain of the operators' complaints – specifically GBRf, VTEC, and ARN - misstate how analysis from the ODA tool, and indeed the theoretical model tools, is used to generate planning values. Some operators seem to suggest that NR simply takes the value suggested from a theoretical model / the ODA analysis, and uses that as the planning value in the TPRs without further thought or judgment. That is not the case.

55. The first step is, of course, the usual QA measures within the analysis team – that is, the primary author of the ODA report, who will have already reviewed the work of others who have inputted into the report, will have the report checked and approved by a second individual within NR's Capacity Planning team.

56. The second step is to consider and review the results of analysis more broadly within NR, including through those with experience of local conditions on the route in question. This is the relevant Capacity Planning team(s) within Network Rail and usually the Route Performance team. The teams review each of the ODA outputs to ensure that they appear accurate, reviewing performance data to identify any correlation with, for example, any available unexplained delay data. Where results are challenged, the data is recalculated to ensure that no errors have been made during the data manipulation process. Recalculations can also include reviewing the selected percentiles for SRTs where it is possible that the data has been skewed by, for example, a temporary speed restriction on the network or timetable allowances. This has not yet led to NR selecting a percentile other than the 25th percentile for SRTs, but the review mechanism remains in place.

57. This review provides a sense check against the results produced from data alone, provided by those with experience of the local conditions, and it allows NR to account for any local peculiarities that might affect the robustness of the data analysed.

58. Only after this process are the results used to inform what NR considers the most appropriate planning value for the Rules. However, the NR team is entirely open to reasoned queries and comments from operators, and different views on the appropriate planning value, which it obtains through consultation with operators.

59. Over 2,600 TPRs have now been reviewed through ODA analysis, leading to approximately 500 revision proposals in the December 2017 and May 2018 timetables.

Consultation with Operators

60. Within NR's Capacity Planning team, there are around 170 individuals involved in the delivery of our TPRs and the WTT. Each geographical area or 'route' is led by a timetable production manager. Each manager is responsible for maintaining an effective relationship with operators within their route, maintained through engagement on a daily basis (via calls, email and meetings), as well as frequent meetings such as TPR forums. TRIP has introduced substantial innovations in the TPR process and better informed revisions to the Rules being proposed by NR. An ongoing priority, for both NR and operators, is to avoid operators being surprised by the new WTT that is published at D26. Indeed, the input of operators to the TPR process is sought and actively encouraged throughout the process.

61. Analysis from theoretical models has been used successfully to propose, consult on and take forward a substantial number of revisions **(Annex / File 1 / Tab 2 / 120-122)**. These have appeared in previous versions of the TPRs, and indeed in V1 and V2 of these Rules.

62. As I indicated at paragraph 16 above, ODA (and the use of observed data from the network in a database, rather than theoretical modelling) has always been an integral part of TRIP, with support and sponsorship from the National Task Force. This revision of the TPRs is however the first occasion on which ODA analysis has been through the consultation process, used to inform revisions to the Rules, and reached the stage of operators either agreeing or issuing appeal notices.

63. Mindful that analysis through ODA would be a substantial development from how real-world data had previously been analysed, and a different approach to the models previously applied using TRIP, NR carried out extensive work to familiarise and consult with the operators about the ODA process, the methodology of ODA analysis and, subsequently, the findings of specific ODA analyses.

64. At a local level, operators were familiarised with ODA early and often. Operators were introduced to the ODA tool itself through 'first peek' sessions in July 2015 **(Annex / File 1 / Tab 3 / 166-190)**.

65. NR then identified particular priority areas of geography for ODA analysis, which would then inform changes to subsequent revisions of the TPRs, and organised and agreed those analyses with the lead operator in that area **(Annex / File 1 / Tab 2 / 107-108; 126)**. For some areas – as for example with the first ODA analysis of the LNE Berwick to Newcastle line – areas were selected for ODA analysis at the request of the operators themselves **(Annex / File 1 / Tab 3 / 191-194)**.

66. Thereafter, and in conjunction with agreeing the remit of various ODA analyses, there followed additional familiarisation sessions with the operators, via TPR forums, which explained the ODA tool and its proposed use in the TPR.

67. These familiarisation sessions were adapted for each TPR forum but generally followed the structure of the 11 February 2016 presentation to the LNE TPR forum **(Annex / File 1 / Tab 3 / 148-162)**. These presentations would then be discussed by the forum **(Annex / File 1 / Tab 1 / 21, at 23)**. An annotated example of an ODA headway analysis, taken from the Luton to Bedford line, appears within NR's presentation to operators of 11 February 2016 **(Annex / File 1 / Tab 3 / 154)**.

68. Although each operator's position during and in response to these familiarisation sessions varied, and some were more engaged than others in what was then a discussion about potential changes in future TPRs rather than immediate revisions to the Rules, the vast majority of operators were (and remain) generally receptive to the use of greater 'real-world' data in considering changes to the TPR. Indeed, some operators, such as Virgin Trains, had specifically requested the use of ODA analysis within their geography of operation. This consultation on the ODA tool was, of course, in advance of any proposed change to the Rules based on ODA analysis.

69. All analyses derived from the ODA tool are reviewed through this consultation – having also been through NR's internal review including by those with local expertise - before being used to propose changes to the Rules. The process is as follows:

69.1 Any ODA analysis is provided to the relevant local operator for their review and comment. This performs a similar role to NR's internal analysis (described in paragraphs 56 to 58 above), and takes place through email, teleconferences, and at TPR forums. Reviews with operators have sometimes been done simultaneously to the reviews with the internal Network Rail teams, particularly where the initial request for analysis has come from an operator. In these instances, draft report outputs have also typically been shared to give early visibility and seek feedback on the findings.

69.2 In many cases, the operators provide queries, comments and feedback which are addressed and considered prior to NR distributing the first Draft Rules, and indeed prior to the formal consultation process between D-64 and D-60 under section 2.2. of Part D of the Code.

69.3 This consultation process has included comparisons with other sources of data where these are available. For example, where operators indicate that values suggested by ODA analyses are contrary to their internal data, NR will ask operators to supply that data and the basis of the operator's calculation. For example, as part of this process, GPS data has been supplied by some operators. While GPS records by themselves provide a less robust source of data than the databases used by ODA, they provide a useful comparator and can help provide additional insight into performance for the area under review. Any differences can be identified and further investigation undertaken where necessary in order to ensure that the ODA analysis and its inputs accurately represent reality.

69.4 Unfortunately not all operators have been as cooperative – some operators (including Scotrail and Northern) have asserted that an analysis based on GPS data is preferable but then declined to provide access to it; while others, such as GB Railfreight, have taken the position that there is no need to provide evidence in support of the existing planned values.

69.5 That point aside, in general the level of engagement from operators after receiving ODA analysis in their geographic area but prior to NR's submission of draft Rules has varied: some have been very interested in the detail of the analysis, while others have made no comment at all, and prior to the Network Code consultation process there is no express contractual requirement on operators to engage with NR, and so little ability for NR to require the operators to engage in this process. Consultations carried out at the area-specific level and the detail of these consultations with individual operators will be addressed, where appropriate, at the appropriate point in the annexes to NR's response.

70. After initial consultation, at D60 to D59 (Part 2.2.3 of Part D to the Network Code) – NR publishes V1 of the draft Rules. Proposed revisions to the rules are highlighted in the text with green struck through where rules are coming out and red where rules are going in (this is the same process at each version of the Rules). This enables the timetable participants to identify changes easily. V1 is published on the Network Rail external website and generally the individual route sections are emailed to relevant timetable participants. For each version of the Rules a commentary letter indicating the key changes is also published on the Network Rail website.

71. The V1 draft of the 2018 TPRs was published on 21 October 2016. This marked the start of the formal consultation period and provided further opportunity for stakeholders to raise any concerns over the TPR changes proposed.

72. Formal consultation on the changes to the Rules then followed (from D-59 onwards), building towards the publication of V2 of the Rules at D-44 (3 February 2017). Consultation – with 30 passenger operators (open access and franchise operators) and six freight operators - typically occurs either at TPR forums or at meetings with individual operators, and involves a line-by-line review of the proposed changes and the individual values proposed.

73. For these TPRs, meetings were held with each of the Claimants (and indeed with all other operators affected by the changes to the Rules). Many changes to the Rules were uncontroversial, others were queried at least initially by operators.

74. Again, the level of engagement and quality of responses varies between operators, and has indeed varied substantially during consultation of these TPRs. We encourage operators to inform us in writing of any "representations" given for the purpose of section D.2.2.4 (which are to be provided by D54, or in this revision, by 25 November 2016); this was not always received, or received in a meaningful way, during these revisions.

75. With that said, in many cases where a change was initially queried, following consultation between D-59 and D-44, NR's proposed value has been agreed by the operator after further discussion.

76. In other cases, that consultation has led to NR agreeing not to pursue the change. This may be because NR has decided that the initially proposed revision does not accurately reflect network capability; or it may be because, although NR still considers that to be the most appropriate planning value in pure network capability terms, there is some other good reason for deferring any changes to subsequent timetables and maintaining the existing value in the Rules. Examples of the former would be a change in infrastructure or the capability in that part of the network, or a one-off reason for a significant skew in the data, which was not previously accounted for in NR's analysis or prior review. Examples of the latter might be where the planning change (as suggested) would cumulatively involve more changes to the timetable than is on balance desirable, or where it involves a change ultimately considered contrary to a track access contract. Indeed, where other considerations (going beyond accuracy of network capability) are significant, it is often only with operators providing input and information during consultation that these other considerations can be appropriately analysed.

77. Following this consultation, version 2 of the revised Rules was issued on 3 February 2017.

78. Through consultation both before and after 3 February 2017, in most cases initial operator queries have been addressed. However, and although consultation continues and at least some of the Claimants' queries have been narrowed via consultation, a small percentage of the revisions remain subject to appeal.

Decision Criteria

79. In making decisions throughout the TPR revision process, NR is required to balance a number of priorities and considerations, some of which compete with each other. Operators may have different views on a proposed revision to NR, and indeed from other operators affected by that proposal, and each operator will provide a different quality and quantity of feedback. Operators also have different views on the tools of analysis used to inform proposed revisions: one operator may describe a tool of analysis as "*fake science*" when that tool of analysis is enthusiastically welcomed by other operators.

80. I note that some operators – specifically ASR, GWR, and XC - have argued that NR has not made decisions in accordance with the Decision Criteria within the Code.

81. The Decision Criteria are made up of the Objective and the Considerations. The Objective – that in deciding any matter under Part D of the Code, NR's objective "*shall be to share capacity on the Network for the safe carriage of passengers and goods in the most effective and economical manner in the overall interest of current and prospective users and providers of railways services*" – is at the heart of what my team does.

82. In pursuing that Objective, Section 4.6.2 of the Network Code sets out certain criteria, and NR "*shall apply any or all of the considerations*", depending on which it considers relevant, so as "*to reach a decision which is fair and is not unduly discriminatory as between any individual affected Timetable Participants or as between any individual affected Timetable Participants and Network Rail. Where, in light of the particular circumstances, Network Rail considers that application of two or more of the relevant Considerations will lead to a conflicting result then it must decide which of them is or are the most important in the circumstances and when applying it or them, do so with appropriate weight*".

83. The Timetable Planning Rules contain tens of thousands of planning values, which are reviewed, and, where it is thought appropriate, a revision is proposed. Version 1 of the Rules proposed approximately 6,600 revisions. All proposed revisions of the TPRs include a written reason for the proposed change, which is based on the Decision Criteria.

84. There is not, to be abundantly clear, a written 'checklist' document for each potential revision (or decision not to proceed with a revision), through which an individual within NR has identified and weighed each decision against the Section 4.6.2 Considerations, but these are matters which relevant personnel at NR are fully aware of and are at the forefront of NR's whole approach to revisions. I understand from my timetable production managers that the express 4.6.2 Considerations themselves are not a regular feature of conversations with operators at that level, and it would be rare for queries or objections from operators on proposed values to make express reference to any one or more of the 4.6.2 Considerations, but the criteria are more likely to be expressly referenced as matters escalate further up the management chain.

85. Ultimately, every TPR value is intended to reflect the capability of the infrastructure accurately – where it does not it is challenging to reduce delay due to specification error and indeed to meet the Objective. So, accuracy is the starting point for any revision. Accuracy of values underpins almost all of the 4.6.2 Considerations (at least (a), (c), (d), (e), (g) and (j) – and less directly (f) as well) and certainly the Objective. Much of the dialogue with operators (and the subject of many of these appeals) is in relation to the accuracy or otherwise of the proposed revisions.

86. However, on other occasions, other Considerations are also relevant, and can provide a reason to use a planning value other than the most accurate value from a capability perspective.

87. In that regard, and mindful of section 4.1.1 of Part D of the Network Code and of the Decision Criteria in 4.6 of Part D, four specific considerations are provided to individual timetable production managers and their teams, to ensure that the Considerations in 4.6.2 are properly applied and to assist in decision making when considering revisions:

87.1 First, is the planning value reflective of the capability of the infrastructure? This is the central question of accuracy I referred to above (which involves 4.6.2 Considerations (a), (c), (d), (e), (g) and (j) – and less directly (f) as well) and the Objective.

87.2 Second, will the revised values cause a breach of an operator's agreed track access agreement with NR? If so, a revision will not be put forward in the final Rules, because it cannot currently be achieved. In a Decision Criteria sense, breach of a track access agreement will directly impact the commercial interests of Network Rail (and indeed the operator), and so 4.6.2 Consideration (f), but would also cut across the Objective and other Considerations more generally.

87.3 Third, impact on performance. This may involve impact assessments, supporting information from route performance teams, forecast impact on performance in relation to PPM attrition, and information (where provided, which is not in every case) provided from operators. This relates to the Objective and to consideration 4.6.2(c), but also to Considerations 4.6.2(f) and 4.6.2(j).

87.4 Fourth, any impact on the operator, identified to us through the consultation process and impact assessments. Again, this relates to the Objective and to Considerations 4.6.2(c), 4.6.2(e), 4.6.2(f), and 4.6.2(j).

87.5 I note that the four specific considerations noted above do not reference the Considerations at 4.6.2(b), (h), (i), (k) and (l). That is not to say that such considerations would be ignored, were they relevant to revisions to the TPRs, but these considerations are more relevant in relation to other decisions made by NR under the Code - including, for example, building the WTT itself - and less relevant to the building blocks of that WTT, as set out in the TPRs.

88. Where a revision is considered desirable as a matter of reflecting the capability of the infrastructure more accurately, but is not proceeded with for another reason, the revision is not forgotten, but is captured to be addressed via the derogation process **(Annex / File 1 / Tab 2 / 134)**.

89. As I say, often the consultation process for a given revision focuses only upon that first and central consideration of accuracy. However, for other revisions consultation will focus on other considerations, and it is often only through consultation that these other

considerations can be captured adequately. In that regard, and while the individual route timetable production managers will each have their own processes, NR is somewhat reliant on operators to explain why a revision will have an impact on performance, or why it will have an impact upon them. When this information is provided NR is well placed to assess and weigh these considerations appropriately, which it cannot do if operators provide only assertions. Where supporting information is not provided by operators, then all NR can reasonably do is place more weight and importance on the evidence it does have before it.

Operators' Complaints

90. While the content of the operators' complaints (as contained in each operator's Sole Reference Document) varies from operator to operator, the controversy appears to be not so much in relation to the data used or reasoned objections as to the analysis which has informed a revised planning value, but rather that the operator simply does not like the potential impact of the values proposed.

91. As to ODA specifically, given that the data relied upon in ODA analysis is also used by NR and other bodies (noticeably the Office of Rail and Road) outside of the TPR review process, for matters ranging from safety to compensation, it is not surprising that the data itself is not challenged in these notices. Rather, operators query the use of this data in the TPR process. I accept that, despite the vast amount of data forming part of its database, ODA cannot perfectly capture real-world historic performance on the network. However, NR considers that it provides significantly better insight than any other method of analysing real-world data. Moreover, NR does not seek uncritically to impose the values recommended via ODA or any of the other tools of analysis it uses, but performs its own internal sense-check with route planning staff, and has engaged (and will continue to engage) in extensive consultation where specific changes to the Rules prove controversial.

92. I also accept that the volume and potential impact of the revisions being proposed by NR in this latest Revision are significant. However, this is an inevitable consequence of beginning to rely on a much larger set of data which allows NR to make a more accurate assessment of planning values. The majority of operators have agreed that the revisions based on a more modern approach are appropriate, and even amongst the Claimant operators, for the majority these appeals represent only a small number of areas where they continue to have concerns, against a broader background of accepting changes.

93. In that regard at least, some of the operators' objections, although asserting concerns with planning values or the process by which a revision was reformed, seem to be based on nothing more than their preference for existing values as compared to changes which they presently consider to be commercially disadvantageous.

94. It is understandable that an operator would prefer and argue for what they see as the more commercially favourable values utilised within the existing rules, which would facilitate the operator maintaining its existing timetable of services and its ability to operate the same

number of services. That would reflect the operator's preference of its (perceived) immediate and individual interests, as opposed to NR's focus on its objective of sharing capacity on the network in the overall interest of all users and providers of railway services. But I do not think that is a proper basis on which to appeal a revision, and I am concerned that there is an attempt to disrupt, in some cases significantly, a far-reaching project which the operators have been fully aware for many months and indeed years, and which the majority of operators have enthusiastically supported in the knowledge it could involve substantial adjustments.

95. Regardless of the motivations for the appeals, individual operators' preference for the status quo is not however a basis for rejecting the analysis of new tools, nor the Objective which NR has to achieve or the Decision Criteria which NR has to apply. The mere fact that a change is different from historic values, or necessitates changes to the timetable that result in running fewer services in order that those services can arrive on-time, is not in and of itself a basis for rejecting the changes.

I believe that the facts stated in this witness statement are true.

Signed:… … … … … … … … … … … … … … … … … …

Dated:… … … … … … … … … … … … … … … .....