Office of Rail & Road and Network Rail

Mandate L4AR004c: Assessment of Network Rail's Response to the Performance Challenges within the Draft Determination

Final Report

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1 Executive Summary

1.1 General

Arup has been appointed by the Office of Rail and Road (ORR) and Network Rail as Lot 4 Independent Reporter to monitor and evaluate Network Rail's delivery of its outputs and commitments for CP5.

To support the ORR's Draft Determination Arup conducted a study under Mandate L4AR004b[1] and the report was published in June 2018.

Under this current Mandate (Ref. L4AR004c) Arup has provided support to ORR in the development of its Final Determination and, in particular, its assessment of:

- Network Rail's Routes' responses to ORR's requirement for targeted adjustments to its Route Strategic Plans (RSPs); and
- the Routes' analysis of operators' responses to National Task Force (NTF) where additional risks and opportunities for improved performance were identified.

A full copy of the Mandate for this study is included in Appendix A.

In addition, the Reporter was commissioned to review the Network Rail model which converts CRM-P[2] trajectories to TOC-level Network Rail delay minute trajectories and vice-versa.

The output of this work was to inform the publication of the ORR Final Determination for CP6 on 31st October 2018.

The outputs from the earlier study (Mandate L4AR004b) informed this study.

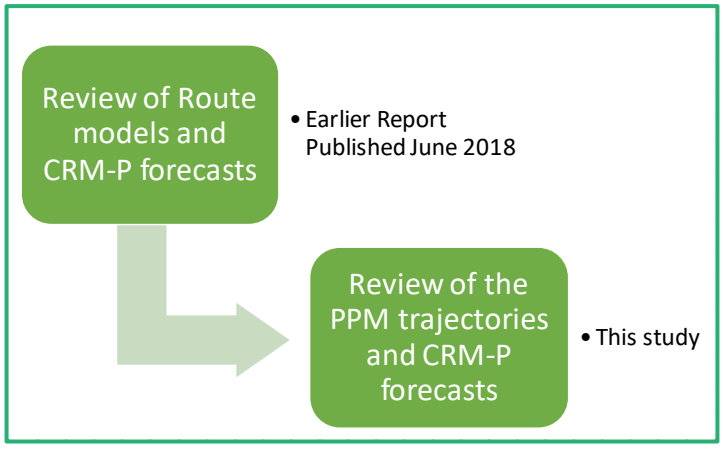

Figure 1-1: Schematic of Input from Previous Study to this Review

[1] Mandate L4AR004b: Assessment of Train Performance Trajectories in Network Rail's Route Strategic Plans for PR18: Arup: 1st June 2018 - http://orr.gov.uk/__data/assets/pdf_file/0004/27913/assessment-of-the-train-performance-trajectories-in-network-rail-route-strategic-plans-for-pr18.pdf

[2] CRM-P is the Consistent Route Measure for Passenger performance. It is a single measure for a Route taking account of Network Rail attributed delays for all TOCs.

1.2 Context

The Periodic Review for CP6 (PR18) is underway and ORR published its Draft Determination for England and Wales and Scotland on 12th June 2018. Analysis of Network Rail's Route Strategic Plans (RSPs) by ORR identified a small number of areas where it required Network Rail Routes to make some amendments to its plans (the targeted adjustment). Specifically, the targeted adjustment required Network Rail to review its CRM-P and PPM performance trajectories for passenger services.

Network Rail provided an initial response to ORR on 13th July 2018, and further adjustments to the performance trajectories were advised by Network Rail on 31st August and on 14th September 2018.

1.3 Approach

The high-level approach adopted to deliver the commission was focused on:

- A first stage review of the Network Rail Draft Determination interim submission of 13th July 2018 to develop a view on the robustness of the trajectories being put forward, and allowing the formulation of questions for direct engagement with the Route teams;
- Meetings with the seven England and Wales Routes and the FNPO[3] to challenge their underlying assumptions used to produce the trajectories associated with CP5 exit, and for the duration of CP6. The Route approach to the additional sustainability investment offered by the Draft Determination was also explored;
- A review of the models used by the Routes in the determination of their trajectories for CP6;
- Direct engagement with certain TOCs to obtain their views, and degree of satisfaction with the process of involvement in the determination of the performance trajectories for CP6; and
- A second stage review of the outcomes identified above taking account of the final submissions from the Routes between 31st August and 14th September 2018 including specific modelling updates.

ORR is focused on the CRM-P trajectories and hence commentary has been provided in the report relating to CRM-P. The inputs to CRM-P are the operator level PPM trajectories, and so this study centred on these trajectories developed by the Routes for individual TOCs.

In parallel, a review was undertaken of the Network Rail models converting CRM-P to PPM and delay minutes, and an audit of the model converting PPM to CRM-P.

Figure 1-2 provides an overview of the review structure.

[3] Freight & National Passenger Operator

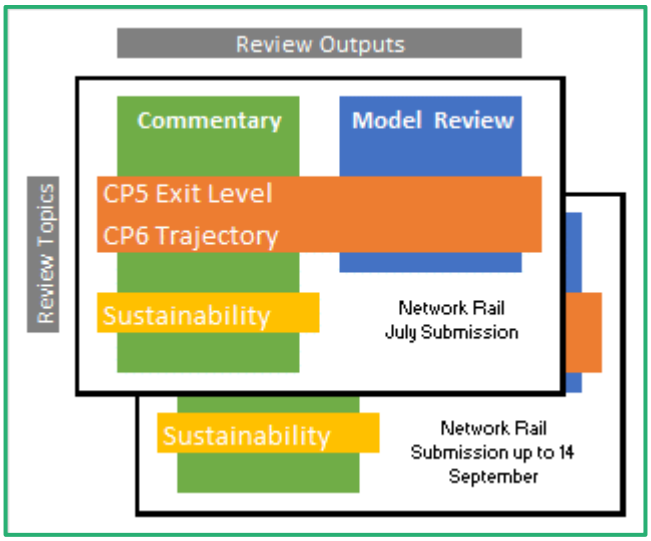

Figure 1-2: Overview of the Review Structure

The timing of the study, and the further adjustments to the performance trajectories from Network Rail, as well as the engagement with key operators resulted in the Reporter undertaking two rounds of assessment of the trajectories – first one based on the 13th July submission and a second based on the data available up to the 14th September 2018.

Reviewing the forecast performance of the freight operators was not considered as part of this review.

1.4 Grading

A five-point scale has been adopted to indicate the level of confidence the Reporter has in the PPM trajectories proposed by the Routes. This scale is shown below.

Scale	Definition
High Confidence	The evidence provided demonstrated a strong understanding of the issues and their impact
Reasonable Confidence	The evidence provided largely justified the forecast however there were some residual issues which raise some doubts on delivery
Some Confidence	The evidence provided included some justified elements in the forecast but also contained some significant issues which detracted from the overall confidence in the outcome
Low Confidence	The evidence contained issues that were not considered to be wholly credible leading to doubt in the forecast outcome
Little Confidence	The evidence provided lacked structure or logic and contained significant issues which were not considered credible

Table 1-1: Five Point Scale of Confidence used throughout the Report

A confidence grading was awarded to each Route based on:

- The approach used by the Route in developing its PPM trajectories including the models used to generate the trajectories;
- The effectiveness of the engagement with the operators during the process; and

- The scope and impact of initiatives included in the assessment of the trajectories.

Consideration of the realism / stretch in the trajectories was derived from an overall assessment of the targets that had been put forward by the Routes and the Reporter's view on their credibility.

The Route output from the process is the trajectory for each of the TOCs. Thus, confidence in the elements of the process described in the bullets above was considered to translate into a confidence in the output trajectories.

1.5 Findings

1.5.1 PPM Trajectory

The Reporter has combined various elements of the study into a single view of confidence in the Route's PPM trajectories based on Network Rail's submissions up to and including 14th September 2018.

This view, along with a justifying commentary, is provided in Table 1-2.

Route	Commentary	Confidence
Anglia		We have some confidence in the proposed PPM trajectory
LNE & EM		We have low confidence in the proposed PPM trajectory
LNW		We have reasonable confidence in the proposed PPM trajectory
Scotland	This Route was not reviewed	

South East	
Wales	
Wessex	
Western	

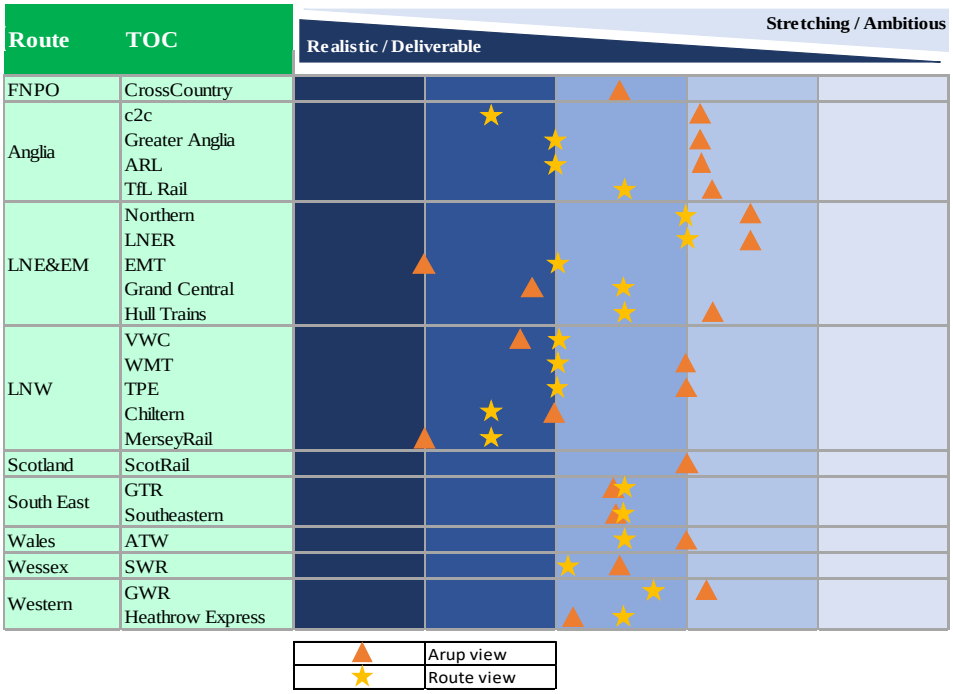

Figure 1-3: Reporter View of PPM Trajectory Delivery for each Operator

1.6 CRM-P Trajectory

CRM-P is a measure of Network Rail's performance and is based on delay minutes. CRM-P measures primary and reactionary delay minutes to passenger services caused by each Network Rail Route, normalised per 100 train kilometres. It is calculated on the delay that a Route causes, rather than delay caused by train operators.

The CRM-P trajectories are calculated by reviewing the change in Network Rail caused PPM failures which are then converted to delay minutes based on the historical relationship between PPM and delay minutes for each TOC.

In our meetings with Network Rail, Route representatives indicated that generally Network Rail was slightly more confident in the CRM-P trajectories than the PPM trajectories. This generally appeared to be because PPM trajectories include operator led initiatives where delivery was considered to be less certain.

The Reporter derived a Route CRM-P assessment based on a weighted (based on numbers of trains) combination of the individual TOC PPM confidence ratings.

Reporter confidence in the CRM-P trajectories was that LNE&EM was stretching and ambitious. This was primarily based on a low level of confidence in the process used to derive the PPM trajectories for this Route. Western and Anglia Route CRM-P trajectories were also considered to be stretching but there was a greater level of confidence in their processes. The remainder of the Routes had a broadly neutral assessment of delivery confidence but with varying degrees of confidence in their processes for deriving PPM. The Reporter had the greatest level of confidence in the processes used to derive PPM trajectories by Wessex Route.

The Reporter view of the credibility of trajectories for CRM-P and confidence in the process to derive the PPM trajectories to produce them is summarised below in Figure 1-4.

		Realistic / Deliverable → Stretching / Ambitious				
Confidence in Process	Not Enough Information			Scotland		
	Little					
	Low				LNE&EM	
	Some			Wales	Anglia Western	
	Reasonable			South East LNW		
	High			Wessex		

Figure 1-4: Credibility of CRM-P

1.7 Asset Sustainability

The ORR Draft Determination[4] challenged Network Rail on asset sustainability and identified a further £1bn investment in asset sustainability and established a performance innovation fund of £10m. This was with the expectation that Network Rail would in their updated submissions reflect consequential changes to performance trajectories arising from any additional renewals spend as a result of this incremental funding.

The geographic Routes included documentation regarding asset sustainability in their 13th July submission. Whilst there was broadly some attempt to demonstrate a potential linkage between the impact of the additional investment in sustainability and performance none of the Routes built it into their trajectories.

Discussions with the Routes indicated that they had not relied on this additional investment in their performance trajectories as there remained some doubt about the share the Routes were going to receive. Accordingly, whilst some Routes had put some effort into making an assessment of the impact on performance no Routes were prepared to add it into their trajectories.

As a result, it was considered that the treatment of the additional investment in sustainability by all Routes was disappointing.

1.8 CRM-P to PPM Conversion

Network Rail has developed a forecasting model to convert Route forecasts of PPM for each TOC, for which they lead, into a CRM-P trajectory for the Route. Network Rail has subsequently developed a 'reverse' version of this model to convert CRM-P forecasts for each Route into Network Rail delay minute forecasts for each TOC. The Reporter was asked to review this latter model as part of this commission.

The findings from this review were that the model was working as intended and that it was suitable for converting CRM-P into normalised Network Rail delay minutes for each TOC.

1.9 Recommendations

The following recommendations are made in relation to this review.

[4] ORR 2018 Periodic Review Draft Determination – overview of approach and decisions June 2018

No.					Target Date for Completion
L4AR00x 01	Network Rail should ensure there is greater engagement with freight operators in the process to agree performance trajectories since it is recognised that the FOCs impact on TOC operations and vice-versa.	a more complete involving potentially high-risk operators	meetings with these operators	FNPO	June 2019
L4AR00x 02	Network Rail Routes should consider process improvements to ensure their key performance teams have access to / knowledge of industry schemes (for example the Digital Railway Programme), operational practice, and strategic schemes to improve the quality of their performance trajectories.	This will deliver improved outputs based on best practice expertise	Documented processes incorporating the change and evidence of application	NR	June 2019
L4AR00x 03	Network Rail should ensure that all Routes (including FNPO) use recognised best practice statistical analytical methodologies in the development of their performance trajectories, supported by the National Performance Team. (Noting that one size does not fit all, it is only the methodologies that should be standardised, not the inputs.)	This will generate a more consistent set of forecasts with verified confidence levels. This is considered important given the enhancement pipeline and the change processes to be adopted in CP6.	Documented processes incorporating the change and evidence of application	NR	June 2019
L4AR00x 04	The Network Rail Routes should consider improvements to their processes to include a number of standard templates for engagement with Operators (both passenger and freight)	This will generate a standardised engagement profile which will allow easier interpretation. It will also generate an auditable trail of correspondence and engagement.	Documented processes incorporating the change and evidence of application	NR	June 2019

Table 1-3: Study Recommendations

1.10 Acknowledgements

The Independent Reporter Team would like to thank Network Rail, ORR and TOC staff for their assistance with this study.

2 Introduction

2.1 General

Arup has been appointed by the Office of Rail and Road (ORR) and Network Rail as Lot 4 Independent Reporter to monitor and evaluate Network Rail's delivery of its outputs and commitments.

To support the ORR's Draft Determination Arup conducted a study under Mandate L4AR004b[5] and the report was published in June 2018.

Under this current Mandate (Ref. L4AR004c) Arup has provided support to ORR in the development of its Final Determination and, in particular, its assessment of:

- Network Rail Routes' responses to ORR's requirement for targeted adjustments to its Route Strategic Plans (RSPs); and
- The Routes' analysis of operators' responses to the National Task Force (NTF) where additional risks and opportunities for improved performance were identified.

A full copy of the Mandate is included in Appendix A.

In addition, the study reviewed the Network Rail model which converts CRM-P trajectories to TOC-level Network Rail delay minute trajectories, and audited the model converting PPM to CRM-P.

The output of the commission is required to inform the publication of the ORR's Final Determination for CP6.

2.2 Scope

There are three elements defined in the Mandate to be undertaken as part of this commission.

1. With regard to Anglia, Wessex and South East Routes' (and Wales as appropriate) performance trajectories assess and assure Network Rail's review of the above including:

- The methodology employed in recalculating performance trajectories;
- The rationale the Route has set out for any change; and
- Any consequential impacts on other Routes.

2. With regard to risks and opportunities identified by operators' (through the National Task Force). Review and assure Routes' response on:

- The validity of Routes' responses to these identified risks and opportunities; and
- The robustness of the re-calculations of any performance trajectories that have changed or should change, both for the lead Route and any consequential impacts on other Routes.

[5] Mandate L4AR004b: Assessment of Train Performance Trajectories in Network Rail's Route Strategic Plans for PR18: Arup: 1st June 2018 - http://orr.gov.uk/__data/assets/pdf_file/0004/27913/assessment-of-the-train-performance-trajectories-in-network-rail-route-strategic-plans-for-pr18.pdf

3. With regard to potential funding for asset sustainability and performance innovation –

- The validity of Routes' responses to the potential funding;
- The robustness of the re-calculations of any performance trajectories that have changed or should change, both for the lead Route and any consequential impacts on other Routes.

2.3 Approach

The high-level approach adopted to deliver the commission was based on the structure of the scope of the study defined in Section 2.2. This was focused on:

- Review of the Network Rail Draft Determination interim submission of 13th July 2018 to develop a view on the robustness of the trajectories being put forward, and allowing the formulation of questions for direct engagement with the Route teams;
- Meetings with seven geographic Routes and the FNPO to challenge their underlying assumptions used to produce the trajectories associated with CP5 exit, and for the duration of CP6. It also tested their approach to the additional investment in sustainability offered by the Draft Determination;
- A first-hand review of the models used by the Routes in the determination of their trajectories for CP6;
- Direct engagement with TOCs to obtain their views, and degree of satisfaction with, the process of involvement in the determination of the performance trajectories for CP6;
- A second stage review of the outcomes identified above taking account of the final submissions from the Routes up to 14th September 2018;
- A review of the Network Rail model converting CRM-P to PPM and delay minutes; and
- An audit, based on sampling, of the model converting PPM to CRM-P.

2.4 Report Structure

This report is structured such that it provides a means of understanding the build-up of evidence from the stages identified above leading to a view from the Reporter of its confidence in the process and outcome.

Central to this is the two-stage approach to the review whereby initial findings were developed based on the interim submission from Network Rail and the Route meetings which are described in Section 4. With the input from the TOCs and the final submission from Network Rail on 14th September revised findings were then developed and these are described in Section 6.

The report structure is illustrated in Figure 2-1.

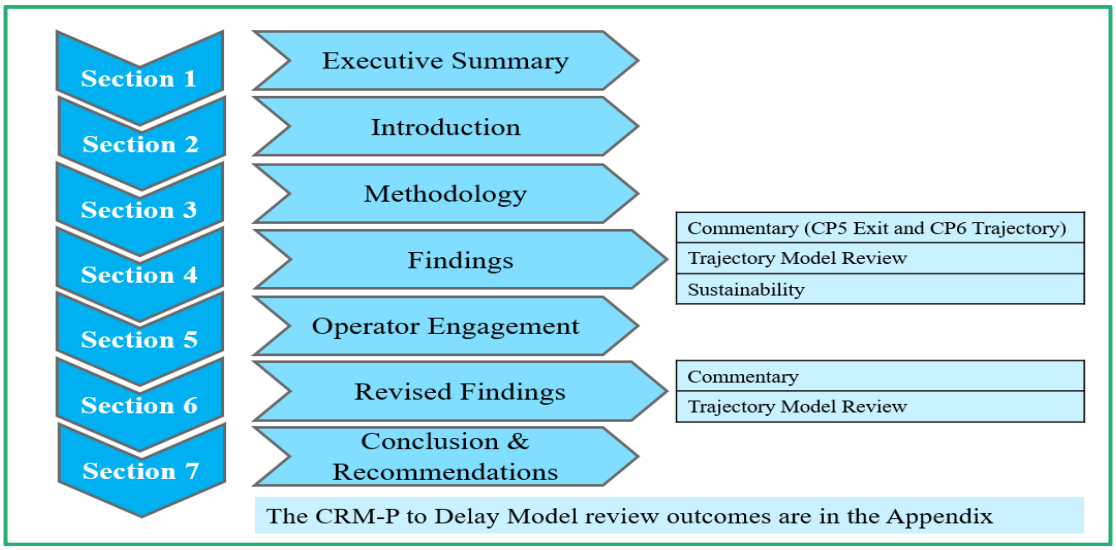

Figure 2-1: Final Report Structure

The timeline feeding the assessment of the available data is shown in Figure 2-2.

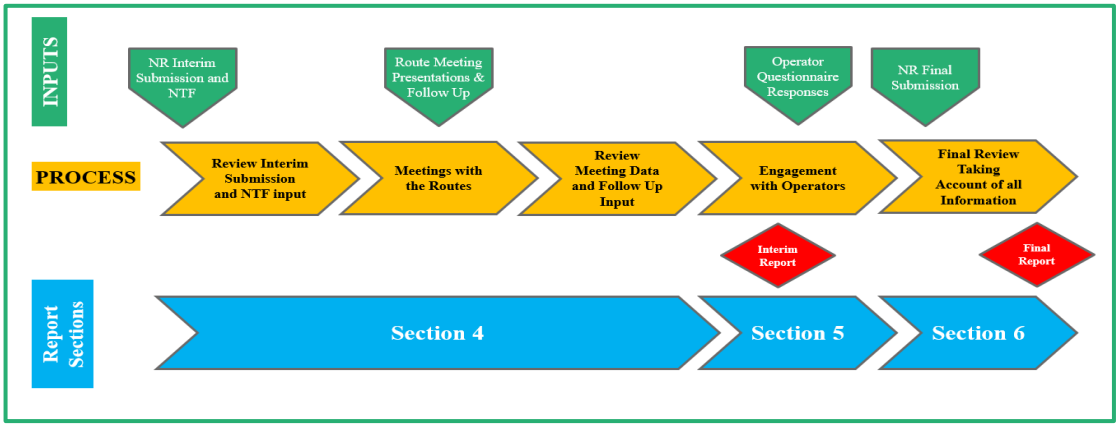

Figure 2-2: Timeline Development of the Review of the Available Data

This final report presents a history of the development of the Reporter's confidence levels as it developed through two prime stage. Section 4 summarises the Reporter view based on the July submission from Network Rail and the meetings with the Routes.

Section 5 summarises the input from identified operators which was then available to the team.

Section 6 takes account of the further input from Network Rail (on 31st August and 14th September) to update the initial confidence levels (in Section 4) to present a final assessment for the complete review.

The review of the CRM-P to PPM model is contained in Appendix E.

The outcome of the audit of the PPM to CRM-P model is included in Appendix F.

3 Methodology

3.1 Introduction

This section of the report describes the overall approach that was adopted in the delivery of the Mandate.

3.2 Overall Approach

3.2.1 Previous Review

A review of the modelling adopted by Network Rail in the development of its performance trajectories for CP6 was undertaken by the Reporter[6] in early 2018. This considered each of the models that had been developed by the Routes and provided a commentary on the fitness for purpose in each case. The findings of this earlier review influenced the defined scope of this Mandate in that it directed focus to certain Route models.

As a principle, where the previous review had been satisfied with a model, and that model had not been changed for the July or August / September submissions, then it was considered to be satisfactory. However, in practice most of the Route models had been changed either in the mechanics of the development of the outputs or in terms of the assumptions made behind the calculation.

3.2.2 Submissions

At a high level the approach that was adopted to deliver the Mandate was based on the review of the available documentation followed by direct engagement with Network Rail to challenge the assumptions and trajectories that had been produced. A list of documents supplied for the review is included as Appendix B.

As noted at the time of the submission of the Mandate proposal, it was understood that the work would need to be focused around two formal submissions by Network Rail as their response to performance in the Draft Determination.

An interim submission was made by Network Rail on 13th July. This formed the basis for the early review of their forecasts and assumptions, and was the core information influencing the topics for discussion at the Route meetings. The outcome of this early work was a view on the Reporter's confidence in the outcomes forecast in the interim submissions.

On 31st August Network Rail provided the ORR with a further submission. This was subsequently updated in a final submission on 14th September 2018 which rectified a small number of errors. Based on the new submission the review team then made an assessment of the changes made to the trajectories to determine if their view of the interim submission had been altered in the light of new information.

[6] Mandate L4AR004b; Assessment of Train Performance Trajectories in Network Rail's Route Strategic Plans for PR18: Arup: 1 June 2018

This report reflects the views on the interim submission, which represented an in-depth analysis, and the impact of the changes that emerged following the final submission. This two-stage process has been documented in order to illustrate the movement that took place during the course of the revised submission.

3.2.3 Submission Contents

As part of the review of both submissions consideration was given to different aspects of the work that had been undertaken by the Routes with each of these contributing to the overall view of the Reporter's confidence of the quoted performance outcomes. Specifically, the elements of the individual trajectories that were considered were:

- CP5 exit performance level; and
- PPM trajectory through the years of CP6.

As part of this a view was taken of the associated narrative in the Network Rail submissions to allow the Reporter to make an assessment of the assumptions that had been adopted, their realism and influence on the trajectory outcome.

The review also considered these from the aspect of the models which had been developed by each Route to generate their trajectory values.

Separately, a review was undertaken of the approach taken by each of the Routes to respond to the question of asset sustainability and the potential extra investment in that area. In particular, this focused on the impact on performance assumed by the Route.

Figure 3-1 provides a graphic illustration of the overall approach and outputs.

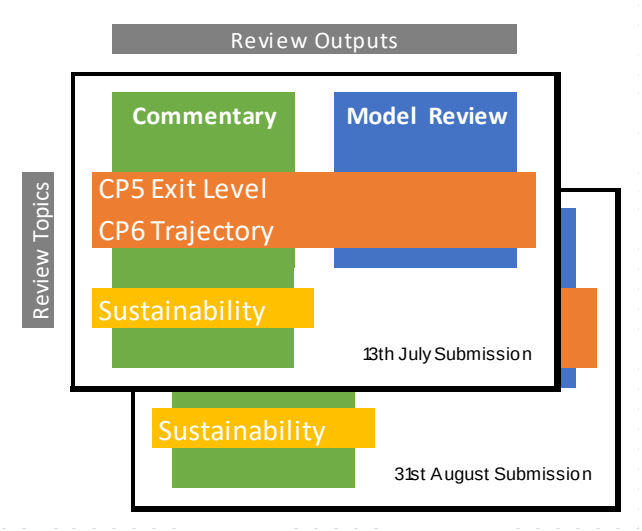

Figure 3-1: Overview of Review Structure

3.3 PPM Trajectory Review

The core of the review was focused on the performance trajectories produced by each of the Routes. In each case the study reviewed the contents of the documentation by considering:

- The approach that had been adopted in each case;
- The assumptions underlying the trajectories; and
- The impact of the engagement between the Route and the operators.

Based on the interim submission, and taking account of the foregoing topics, a Technical Note[7] (see Appendix G) was prepared and shared with ORR and Network Rail summarising the Reporter views on each Route submission. The review also influenced the agenda items for subsequent meetings with the Routes.

Following these Route meetings, a further Technical Note[8] (see Appendix H) was prepared which provided an updated view of the Reporter's view of the robustness and confidence in the performance trajectories that had been developed. This document was also shared with both ORR and Network Rail.

Based on the meetings, and the commentary provided in the second Technical Note, there was further informal engagement with Network Rail to close out some of the identified issues. This included the submission of more information to allow the Reporter to better understand the justification for some assumptions made in the models used to generate the trajectories.

Based on the outcomes of the initial review and the Route meetings it was clear that certain operators either had significant concerns regarding the process, or had been identified as having significant issues. The study then sought to engage with these operators to better understand their position.

At this stage an Interim Report was produced to crystallise the direction of travel of the review based on the assessment of all available information at that time. This was issued on 30th August 2018.

With the receipt of the submission from Network Rail on 31st August, subsequent dialogue, and the final input from them on 14th September a further review was initiated. This second review was principally based on determining the impact of the changes that had occurred since the interim submission. As well as considering the revised submissions contact was made with some Route modelling teams to again clarify aspects of the changes that had taken place to better inform the Reporter's latest view.

3.4 Asset Sustainability

As with the review of the trajectories, the asset sustainability submissions from each of the Routes formed the core of the initial review. Based on this, specific elements of their individual sustainability submissions were probed at each of the meetings. The Reporter's commentary with regard to asset sustainability at the pre- and post meeting stages was documented in each of the Technical Notes referenced above. It should be noted that no detailed modelling had been undertaken by the Routes with regard to asset sustainability in relation to performance.

[7] Technical Note: Pre-Route Meeting Early View: Arup 3rd August 2018
[8] Technical Note: Post-Route Meeting Early View: Arup 24th August 2018

The final submission from Network Rail did not contain any material difference to the sustainability approach which would alter the initial view in this area. As such, no further review of asset sustainability was undertaken.

4 Initial Findings

4.1 Introduction

This Section of the report sets out the review findings based on the documentation that was submitted on 13th July and the subsequent engagement with the Route teams. These findings were in advance of the submissions post 30th August or feedback from the operators. The Reporter's findings following assessment of these further submissions are covered in Section 6 of this document.

The Section is structured such that it provides commentary on the individual Route forecast for the:

- Level of PPM at the exit from CP5; and
- PPM trajectory during CP6.

This divide was adopted since it was considered that these two elements contributed to different aspects of the PPM trajectory outcome.

A separate sub-section provides a view of the impact of asset sustainability investment on performance.

Finally, a summary of the overall assessment of the submission by Route is provided.

It should be noted that there was some variety in the submissions and methodology adopted by each of the Routes. Consequently, the Route information presented within the remainder of this Section reflects that diversity in terms of depth and content that the Reporter was able to review and comment upon.

4.2 Anglia Route

4.2.1 CP5 Exit

Anglia is lead Route for four TOCs. The Route forecasts for their exit position for CP5 are summarised below in terms of what was submitted within their Strategic Business Plan (SBP) and the revised July projections.

TOC	SBP CP5 Exit PPM	Revised CP5 Exit PPM	Comment
Arriva Rail London (ARL)	95.2%	95.3%	Variations to the TOC forecasts to the end of CP5 are based on the extreme weather experienced; some re-profiling has been undertaken and is reflected in the revised CP5 exit values.
C2C	95.6%	95.8%	
Greater Anglia (GA)	89.6%	89.5%	
MTR Crossrail (MTRC)	94.4%	94.3%	

Table 4-1: Anglia Route CP5 Exit Positions by TOC

Recent performance issues had impacted on the CP5 exit, with emphasis being given to the hot and cold weather extremes experienced over the past year. Anglia was unable to confirm if further amendments would be needed to be made to the CP5 exit positions. It was also stated by the Route that benefits from the fleet replacement programmes led by MTRC and C2C had not met expectations.

Since the original SBP submission in February 2018, Anglia anticipated that they will undertake a re-profiling exercise in year one of CP6 as extreme weather impacts had not been considered previously. The Route was investigating the effect of these weather extremes on Route assets and how, in conjunction with the TOCs, they could improve the rate of event recovery time.

Based on the review of the 13th July submission documentation and the subsequent meeting, there was reasonable evidence indicating that Anglia had engaged with its four TOCs. A document summarising recent TOC engagement along with a summary of actions had been provided as evidence of the ongoing dialogue.

The presentation and documents previously provided, confirm that Anglia had been open in relation to their ongoing revisions of the CP5 exit positions, with recent changes focussed upon the effects of the hot summer weather.

However, because of the impacts of severe weather and new fleet benefits not being fully realised the Reporter had low confidence in the Route achieving the CP5 exit point.

4.2.2 CP6 PPM Trajectory

Anglia had agreed proposed CP6 trajectories with both ARL and C2C. Key improvements for ARL included line electrification, fleet replacement and enhanced service frequency. Whilst C2C had less opportunity to make significant changes their focus was on achieving improved asset reliability across the whole Route, new rolling stock, introducing enhanced automated regulation and service management decision support tools.

The Route submission did not provide a quantification of the performance factor effects on PPM.

MTRC

MTRC had agreed to the performance plan but not the associated PPM trajectory.

Anglia Route were working collaboratively with both MTRC and Western Route to develop and deliver the new Elizabeth Line in terms of both development and agreement of the service specifications. Meeting discussions indicated that the Route continues to have reservations and uncertainties relating to the impact and opportunities offered by the new Elizabeth Line, and that large risks associated particularly with the integration of services by several TOCs in conjunction with the MTRC high frequency service plans remain. Ongoing discussions between Anglia and MTRC continue in relation to the provision of new infrastructure, depot access and operational processes. Differences remain between the signalling of the new line and the historic Route network, and understanding of the operational capability of these was ongoing.

MTRC were also committed to full fleet replacement during CP6.

GA

GA had not signed off its PPM trajectory due to franchise commitments however it had agreed to the Strategic Plan. GA aimed to increase passenger numbers through a mix of more services and service improvements. To prepare for this, significant network preparatory works are required, including works at some level crossings to allow increased line capacity and changes to operational practices for example, selective door opening to allow for longer train sets.

It was noted that Anglia Route and GA were yet to agree the benefits offered by new rolling stock in conjunction with associated timetable changes.

4.3 London North Eastern & East Midlands Route

4.3.1 CP5 Exit

For the five TOCs for which LNE&EM is lead Route the Network Rail position for their forecast exit position for CP5 was:

TOC	SBP CP5 Exit PPM	Revised CP5 Exit PPM	Comment
East Midland Trains (EMT)	91.7%	91.7%	No changes have been made with regard to the latest submission
Grand Central (GC)	85.4%	85.4%	
Hull Trains (HT)	82.3%	82.3%	
London North Eastern Railway (LNER)	83.8%	83.8%	
Northern Railway (NoR)	89.0%	89.0%	

Table 4-2: LNE&EM Route CP5 Exit Position

It was clear from the dialogue at the meeting with the Route team that there was an acknowledgment of significantly poor performance since the original SBP submission in February 2018, which had impacted on the Route's view of the CP5 exit position. Quoted as being of particular note were the extreme weather conditions and the impact of the May 2018 timetable change.

Analysis was presented to show the causes of performance worsenment for the three franchised TOCs over the previous 13 periods.

TOC	P4 17/18	P3 18/19	Comment
EMT			
LNER	84.0%	77.3%	The three biggest causes of degradation were: TOC on TOC*; Fleet; and Network Management
NoR	90.7%	84.7%	The three biggest causes of degradation were: Operations; Traincrew; and Network Management

* The Route stated that GTR was the biggest cause of TOC on TOC delays

Table 4-3: LNE&EM Route Factors Affecting Performance at CP5 Exit

There was evidence to suggest that the Route had been in dialogue with all five TOCs with a view to trying to reach agreement on the CP5 exit position. The detail of such engagement was not however clear. The position with EMT, GC and NoR was noted as being particularly influenced by the recent poor performance promulgated by the poorly executed May 2018 timetable change, and the need to reach agreement on the impact of that on the exit level. The Route stated that their efforts to reach agreement on the CP5 exit level were closest with EMT, furthest away with NoR, with LNER in the middle.

Based on the presentation and the documentation previously reviewed there was evidence of a systematic approach to the determination of new exit figures. This had included engagement with the respective TOCs and an acknowledgement of the current performance issues. However, the transition between the levels of performance today and those particularly of LNER and Northern meant that achievement of the forecast levels would be challenging particularly with the fleet legacy from the severe weather, the onset of leaf fall season, followed by winter. Nevertheless, the forecast performance levels for the three franchised TOCs took them back to the level of a year ago. The question was therefore whether the rail landscape had changed to make that now difficult to achieve. However, it was noted that LNER intend to take services out of their timetable which should improve the robustness of their resource plan.

Based on the foregoing there was a reasonable degree of confidence in the achievement of the CP5 exit levels for EMT. The Reporter had some confidence in the achievement of the forecast for LNER and NoR.

4.3.2 CP6 PPM Trajectory

The Route had developed their forecast trajectories through CP6 based on a bottom up approach for each TOC. As noted above there was evidence of engagement with the

respective TOCs in the process to determine the elements of the profile and their quantum. However, it was stated that since dialogue with the TOCs was still ongoing the trajectories may yet change. The Route submission did not include a summary of the factors to understand how performance would be influenced during CP6. The following table summarises the respective PPM trajectories.

TOC	CP6 Entry	CP6 Exit	Change	Comment
EMT				
GC	85.4%	85.01%	-0.39%	This was like EMT with modest fleet improvements of 0.06% outweighed by traffic growth impacts of -0.54%.
HT	82.3%	85%	+2.7%	There were a lot of small positive elements to the PPM trajectory including better timetabling from GPS (+1.0%), improved track (+0.5%) and improved fleet (+0.46%). Traffic growth impacts were also factored in but they had a lesser effect than on other TOCs at 0.39%.
LNER	83.8%	85.6%	+1.8%	The biggest improvement (+1.25%) to the performance was quoted through the introduction of the IEP fleet in 19/20. A further +0.25% each came from reduced external impacts, and service recovery and handover plans. Negative impacts on performance were forecast to come from traffic growth on Thameslink and ECML (combined to 0.66%).
NoR	89.0%	91.1%	+2.1%	Twelve contributing factors were identified of which the one with the greatest impact was Improved Fleet in 18/19 (+1.2%). This was driven by the cascade of rolling stock and the removal of older Pacer units. Benefits from local action to improve traincrew and station staff actions yielded a further +0.4%. A further 0.4% came from the combination of actions regarding recovery and handover plans throughout CP6, and driver controlled operation in 19/20. The remainder provided 0.1% or less impacts either positively or negatively.

Table 4-4: LNE&EM Route Variation in CP6 PPM Trajectory

The PPM trajectory for CP6 was stated by the Route as having been built up from an assessment of the impacting factors and their evaluation. The Reporter requested a copy of the build-up of the assessments of the impact of the individual elements creating the profile but this has not been made available. However, in discussion it was stated that the Route assessment had taken account of the impacts of weather related infrastructure failures particularly those associated with earthworks. It was stated that no account was taken of the adverse effects of the weather on the fleets. An assessment had been included of the impact of the timetable change in the PPM trajectory.

It was noted that their assessment of the impact of reactionary delays was that they were getting worse and that this was reflected in the PPM performance profiles. GTR was stated as being the biggest cause of reactionary delays.

The Route had liaised with South East and LNW Routes to understand the risks from cross-border traffics. The impact of this had been included in the assessment the Route had done to create the PPM trajectories.

It was stated that no assumptions for any benefits from the Digital Railway had been included in the PPM trajectory.

There was evidence that the approach taken by LNE&EM was different to that used elsewhere where models of varying sophistication had been used to drive the outcomes. Instead their use of the bottom up approach of evaluating the individual impacts was different and may be more appropriate to the nature of the Route and its group of TOCs. The Reporter was not able to review the detail behind the PPM trajectory assessments and thus could not comment on that.

Nevertheless, the evidence of engagement with the TOCs and the structured approach to the process is considered positive. There was concern however over the treatment of the new IEP fleet in the sense of assuming a benefit from early in the Control Period without taking account of any 'bathtub' impacts. Also, by their own admission, they had been optimistic over a reduction in reactionary delays, although the means of achieving this was not obvious from the engagement with their Route team.

The modest improvements against the Route trajectories proposed by Hull Trains, Grand Central and LNER were considered to be largely credible.

Whilst it was clear that there had been cross-border dialogue between the Routes it was not clear how their impacts had been considered in the profiles. This led to some concern over how these had been treated.

Based on the foregoing and until the Reporter receives further evidence of the process to assessment of the quantum of the benefits there was limited confidence in the trajectories as presented.

4.4 London North Western Route

4.4.1 CP5 Exit

The Route submitted three sets of documents for each of the five TOCs for which they were lead. These documents were:

1. CP6 Joint Performance Strategy;
2. NTF Pro-forma; and
3. Performance Pack Sign-Off Evidence.

These formed the core of the submission although there was no over-arching Route summary.

The CP5 exit values quoted in the individual Joint Performance Strategies had been taken as the Route's view of performance at that time. These are shown below along with the SBP figures. This shows that there had been little change between the two sets of forecasts.

TOC	SBP CP5 Exit PPM	Revised CP5 Exit PPM	Comment
Chiltern Railways	93.8%	93.8%	No change
Merseyrail	95.0%	95.1%	Small improvement
TransPennine Express	88.5%	89.0%	Improvement
Virgin West Coast	86.5%	87.0%	Improvement
West Midland Trains	88.8%	88.8%	No change

Table 4-5: LNW Route CP5 Exit Position by TOC

Within the performance strategy documentation there was no justification or assessment of the glide path between today's performance figures and the value of the entry level for CP6 in each case.

There was strong evidence of the Route working with the TOCs to discuss future performance in the shape of the strategy documents but it was clear from the Sign-Off Evidence that only Merseyrail had signed off on the PPM trajectory, and Virgin West Coast had signed off on an 'alternative trajectory'. Despite comments in the meeting presentation, these were the only two TOCs which appeared to have signed-off performance strategies.

There was an acknowledgement that since May 2018 there had been a rapid deterioration in the performance of TPE and Northern driven by a significant increase in 'TOC on TOC' impact to TPE. It was noted that once the emergency timetable had been withdrawn the Route was unclear regarding where performance would emerge. It was noted that ongoing discussions were taking place with the TOCs to try to resolve these issues through joint plans.

The current Virgin West Coast PPM was quoted by the Route as 82% meaning that there would need to be a significant improvement in performance to hit the exit forecast.

There was an acknowledgement by the Route that performance had deteriorated recently but their responses to questioning on how this was to be recovered through the significant number of initiatives gave little confidence that a measured and well considered response to the situation was in place.

It was considered that there had been good engagement with the TOCs but that the franchise performance commitments of the TOCs made it difficult for them to sign up to the CP6 entry, and the overall PPM trajectory. The Reporter therefore did not believe that sufficient evidence was presented to justify the CP5 exit level for all TOCs.

Based on the evidence provided there was little confidence in the achievement of the CP6 entry levels for all the TOCs.

4.4.2 CP6 PPM Trajectory

As noted above the Route had prepared individual Performance Strategy documents which were developed jointly with the TOCs. With the exception of Merseyrail, none of these strategies and the PPM trajectory figures contained in them, had been signed off.

In each of these documents there was good evidence of engagement with the individual TOCs with each containing an engagement log with dates and outcomes in terms of the decisions made, any unresolved constraints, and whether this had led to a change in the trajectory.

The identification of the individual initiatives to form the trajectory had been built up from an assessment of the risks and opportunities that the TOC faces. These were then translated into impacts on the profile of the PPM trajectory in three categories of risk, opportunity and enablers. It was considered that the structure of the identification of the factors affecting performance was good.

The strategies each contained fishbone and waterfall diagrams showing the trajectories from CP5 to CP6 exit.

The table below provides comparison between the profiles and franchise commitments where available.

Train Operator		19/20	20/21	21/22	22/23	23/24
Chiltern	Trajectory	93.8%	93.9%	93.9%	94.2%	94.3%
	Franchise	94.3%	94.7%	95.0%	Franchise Renewal	
Merseyrail	Trajectory	94.4%	94.4%	94.9%	95.4%	95.6%
	Franchise	TBC*	TBC*	TBC*	TBC*	TBC*
TransPennine	Trajectory	88.6%	88.7%	88.8%	88.9%	89.0%
	Franchise	91.1%	91.3%	91.5%	91.7%	91.7%
Virgin West Coast	Trajectory	86.4%	86.6%	86.5%	85.9%	86.1%
	Franchise	subject to West Coast Partnership competition				
West Midlands Trains	Trajectory	88.4%	88.8%	88.4%	88.7%	89.1%
	Franchise	90.0%	90.1%	90.3%	90.6%	90.7%

***** The submitted Merseyrail status review questionnaire stated that 'Concession Target will not be set until 2019'

Table 4-6: LNW Route TOC Comparison between TOC Commitments and Network Rail PPM Trajectory

The following paragraphs consider the confidence associated with the outputs for each of the five TOCs, alongside a breakdown of PPM changes by TOC.

Chiltern Railways

The factors which were identified as coming into play during CP6 had both a positive and negative effect resulting in a net betterment of the 0.5% in PPM. The principle factors were:

Factor	Impact	Comment
Fleet Reliability – Project 66	+0.3%	Little detail provided to support this but clearly a TOC driven initiative undermined by the inclusion of 'obsolete components' workstream, which does not generate confidence
Optimised timetable	+0.2%	Based on improved right time resilience, reduced regulation and a review of the fitness of purpose of the timetable
External	+0.3%	This was made up of three components associated with the autumn strategy, route crime and weather resilience each contributing a third of the benefits
Network Rail Operations	+0.3%	Based on better data systems and greater alignment of objectives with the operator
New Enhancements	+0.2%	Designed to provide greater resilience during periods of disruption
Passenger Growth	-0.1%	Caused by higher reactionary delays from lost right time resilience
Network Rail Assets	-0.3%	Impact of ageing assets
Fleet Reliability	-0.3%	Increased number of incidents increasing delay
TOC Operations and Control	-0.2%	Impact of more incidents and increased delays, but undermined by a reliance on employee overtime. The train driver recruitment was not sufficiently well defined to demonstrate confident credibility.
Project Works	-0.1%	Risk on increased mishaps and overruns

Table 4-7: Chiltern Railways Factors Affecting CP6 PPM Trajectory

The quantification of the impacts was based on a review of the historic performance trends.

With reference to Chiltern Railway there was well documented evidence of the engagement with the TOC in the formulation of the trajectories delivered through a well-developed meeting structure.

Merseyrail

It was noted that the TOC had signed off the trajectory that had been jointly produced. As with Chiltern the Route was forecasting a betterment of 0.5% in PPM over CP6.

The identified factors were:

Factor	Impact	Comment
Network Rail Operations	+0.35%	This was derived from a combination of benefits from better systems and data, a focus on right time performance, and better Route alignment with TOC objectives
Optimised timetable	+0.3%	From better timetable modelling and a joint approach to planning
External	+0.25%	Delivered through a 'whole industry' approach to the autumn dip, Route crime and weather resilience
Network Rail Assets (net)	+0.1%	Benefits from the initiative to predict and prevent faults through better maintenance were partially negated by the on-going unreliability of the current asset portfolio
Fleet Reliability (net)	-0.0%	Neutral effect balancing the introduction of new rolling stock with increasing fleet reliability problems
Project Works (net)	-0.0%	There was a neutral effect driven by new schemes
Passenger Growth	-0.1%	Growth causing higher reactionary delays from lost right time resilience
TOC Operations	-0.4%	This was the total impact of factors including IR issues, and the effect of big events

Table 4-8: Merseyrail Factors Affecting CP6 PPM Trajectory

The PPM trajectory of the performance throughout the Control Period started flat to reflect the impact of the introduction of the new fleets but then showed steady improvement of 0.4% per annum on average.

TransPennine Express

Reaching agreement between the Route and the TOC was furthest away in the case of TPE. This was because of the consistent variation between the TOC targets and the forecast trajectory of at least 2.5%. This made it highly unlikely that the TOC would agree those plans.

The PPM trajectory put forward by the Route assumed a modest improvement of 0.4% at a steady rate over CP6. The principle factors are shown in Table 4-9.

Factor	Impact	Comment
Network Rail Operations	+0.3%	This was derived from a combination of benefits from better systems and data, a focus on right time performance, and better Route alignment with TOC objectives
Optimised timetable	+0.3%	From better timetable modelling and a joint approach to planning
External	+0.3%	Delivered through a 'whole industry' approach to the autumn dip, Route crime and weather resilience
TOC Assets (net)	+0.3%	Balancing positive effect of the introduction of the new fleet and the impact of other TOC fleet unreliability
Network Rail Assets (net)	+0.0%	Benefits from the initiative to predict and prevent faults through better maintenance were completely negated by the on-going unreliability of the current asset portfolio

TOC Operations	-0.1%	Considered to be generated by an increased number of incidents and greater delays from each
Project Works (net)	-0.2%	Higher volume of work creating more risk in delivery and overruns
Passenger Growth	-0.4%	Caused by higher reactionary delays from lost right time resilience

Table 4-9: TransPennine Express Factors Affecting CP6 PPM Trajectory

TPE did not engage with the Reporter in this process therefore it was difficult to make an assessment of their supporting evidence.

Virgin West Coast

The submission provided good evidence of collaborative working between the Route and VWC. This was evidenced through the performance meeting structure and the seniority of those engaged in the process.

Performance of this TOC (and West Midland Trains) was expected to be dominated by the impacts of HS2 construction. Along with this the principle factors were:

Factor	Impact	Comment
Network Rail Operations	+0.15%	This was derived from a combination of benefits from better systems and data, a focus on right time performance, and better Route alignment with TOC objectives
Optimised timetable	+0.1%	From better timetable modelling and a joint approach to planning
External	+0.15%	Delivered through a 'whole industry' approach to Route crime and weather resilience
TOC Assets (net)	+0.0%	Balanced view of the impact of fleet reliability
Network Rail Assets (net)	-0.1%	Benefits from the initiative to predict and prevent faults through better maintenance were completely negated by the on-going unreliability of the current asset portfolio
TOC Operations	-0.15%	Worsenment from increased number of incidents and the removal of the Public Book differentials
Project Works (net)	-0.9%	Dominated by the impact of HS2 construction and other Network Rail project works. Small positive impact from enhancement delivery
Passenger Growth	-0.1%	Caused by higher reactionary delays from lost right time resilience

Table 4-10: Virgin West Coast Factors Affecting CP6 PPM Trajectory

The PPM trajectory by year of the performance level was largely neutral up to the end of the second year. It then declined for two years (Birmingham re-signalling) and finally flat-lines for the last year.

It was noted that there had been a long-held target of 88% for the performance on VWC. The current trajectory was lower than this. As a result, the Route had worked with the TOC to identify some early initiatives covering:

- Relatively simple / quick wins;
- More complex / likely to require additional funding; and
- Blue sky / industry changing / requiring significant funding.

The collaborative working between the Route and the TOC on these initiatives had resulted in an 'alternative trajectory'. The documentation provided a good summary of the initiatives that had been identified in this process by the TOC, and the impact of each element. The outcome of this alternative was to deliver a +1.0% in performance over the course of CP6.

West Midland Trains

As with the other LNW TOCs there was good evidence of engagement. The Route and TOC had established a Performance Board to lead the governance of performance delivery.

The PPM trajectory that had been put forward by the Route was adrift from the TOC targets by roundly 1.6% on average throughout the five years. The CP6 exit figure was 1.6% worse for the PPM trajectory against the TOC target.

In terms of the shape of the profile it was highly volatile driven by the impacts of HS2 work, and the performance risk associated with the planned Birmingham re-signalling works in 2021/22.

The key elements of the performance trajectory are shown below:

Factor	Impact	Comment
Network Rail Operations	+0.3%	This was derived from a combination of benefits from better systems and data, a focus on right time performance, and better Route alignment with TOC objectives
Optimised timetable	+0.25%	From better timetable modelling and a joint approach to planning
External	+0.25%	Delivered through a 'whole industry' approach to autumn dip, Route crime and weather resilience
TOC Assets (net)	+0.05%	Balanced view of the impact of fleet reliability
Network Rail Assets (net)	+0.05%	Benefits from the initiative to predict and prevent faults through better maintenance are completely negated by the on-going unreliability of the current asset portfolio
Passenger Growth	-0.1%	Caused by higher reactionary delays from lost right time resilience
TOC Operations	-0.15%	Worsenment from increased number of incidents and IR issues
Project Works (net)	-0.4%	Dominated by the impact of HS2 construction and other Network Rail project works. Small positive impact from enhancement delivery

Table 4-11: West Midland Trains Factors Affecting CP6 PPM Trajectory

4.5 South East Route

4.5.1 CP5 Exit

Based on the review of the submission documentation, the presentation and the meeting discussion there was strong evidence that the Route had engaged with its two TOCs (Southeastern and GTR). This was principally evidenced in the presentation pack with dates and outcome notes. There was an acknowledgement (notes of meeting of 21/06/18 attended by the Route and both TOCs) that there was broad agreement that the performance levels were below forecast due to the significant events which had taken place. This had led to a review of the earlier CP5 exit position by the Route. The Route stated that the CP5 exit position would be worsened not merely by the move to P50 confidence levels (from P80) but also to reflect the significant event impact. The following table shows the latest view of the CP5 exit position.

TOC	Original P80	Revised P50	Current P50	Comments
GTR	81.9%	83.1%	80.9%	Variations to both TOC forecasts to the end of CP5 were based on the severe weather effects, and the re-phasing of the introduction of the Thameslink timetable.
Southeastern	89.5%	90.1%	88.3%	

Table 4-12: South East Route CP5 Exit Position

In reviewing the current position with regards to performance and how this could develop throughout the rest of 18/19 the following was noted:

Southeastern

Severe Weather – the impact was considered by the Route to be greater than the average but within the expected range of variation. It was noted that the Route was undertaking further work to understand the impacts of severe weather but that this had not been concluded yet. As such no special provision had been made in the forecasting to CP5 exit.

Fleet – the impact on fleet performance was considered by the Route to be transient and recoverable during the rest of the year.

Asset Failures - whilst acknowledged as significant it was stated that these were likely to be recoverable through planned initiatives.

Fatalities and Trespass – this was considered to be a growing problem with impacts greater than over the past three years.

GTR

Fleet – the bedding in of the Class 700 series vehicles was expected to deliver greater stability to the fleet performance.

Timetable – this was not considered in a stable position and as such there was residual risk associated with its delivery.

Fatalities and Trespass – similar impact to Southeastern with increasing effects.

The Route has a sophisticated model for determining future performance levels. They had undertaken a detailed engagement with the two TOCs and considered several relevant factors that would potentially impact on performance over the next seven months.

However, the ongoing work associated with the treatment of severe weather meant that it was not possible to develop confidence in their approach yet. This is therefore considered to be a risk.

Regarding trespass and fatalities, it was not clear that the Route had adequate mitigation measures in place to improve the situation, noting that the biggest events had been TOC generated, e.g. through self-evacuation from stranded trains.

The Reporter's assessment of the CP5 exit figures was therefore that they were the product of a reasonable approach but had limitations. It was noted that the TOCs had both not agreed to the revised CP5 exit performance figures.

Based on the review of the submission the Reporter had some confidence that the CP5 exit figures were achievable for both TOCs.

4.5.2 CP6 PPM Trajectory

The principle changes to the CP6 PPM trajectory were around the conversion of the figures to P50 confidence from P80. This had boosted the CP6 exit levels of PPM by roundly 2.0% for both TOCs.

The Route also included the impacts of Digital Railway in its earlier submission, and stripping these out for the network beyond the Thameslink Core route had resulted in a worsenment of 1.2% and 0.8% in the CP6 exit trajectories for GTR and Southeastern respectively.

As noted above the quantification of the impacts of the individual factors affecting the trajectory had been determined using the Route's performance model.

The approach adopted by the Route to deliver the revised CP6 PPM trajectories had been agreed with both GTR and Southeastern however the resulting outcomes had not.

Given the cross-route nature of the Thameslink services the Route was specifically asked about their engagement with LNE/EM Route regarding the potential 'contamination' of performance on both sides of the boundary on these services. It was stated that the assumption had been made that this would have a neutral effect on performance. Given the well-publicised issues with GTR performance this was considered to be a risky assumption.

GTR

The submission provided good evidence of collaborative working between GRT and the Route. This was evidenced through attendance at the Route Review meeting.

Summarised within the following table were the factors affecting performance during CP6. It was anticipated that worsenment of -1.1% in PPM would occur.

Factor	Impact	Comment
Thameslink Timetable Re phasing		
Fatalities and Trespass	-0.2%	This was reflective of the worsenment of the baseline position of this area
TOC Improvements	-0.6%	This took account of the TOC planned reduction in their improvement plans and the Route adopting a cautious view on the impact of a franchise change during CP6
Thameslink Timetable Re phasing	-0.3%	Whilst the original impact of the timetable introduction had been neutral the experience with the May 2018 timetable change had brought about a risk to performance through the further timetable iterations to reach the stabilised Thameslink timetable

Table 4-13: GTR Factors affecting CP6 PPM Trajectory

Southeastern

Unlike GTR Southeastern were not present at the Route review meeting however, they had provided input into the Route presentation which supports the position that the Route had worked in a collaborative manner with this TOC.

The impacts of the various factors affecting the Southeastern PPM performance trajectories over the course of CP6 are shown in the following table. The identified factors were forecast to have a negative impact resulting in a worsenment of -0.7% on PPM during this period.

Factor	Impact	Comment
Thameslink Timetable Re phasing		This took account of the increased interaction between the TOC and Thameslink services but had been modified to take account of the re-phasing
Current Performance and Fatalities and Trespass	-0.3%	The figure took account of the worsenment of performance and the position with fatalities and trespass which was quoted as being "no longer recoverable"
TOC Improvements	-0.3%	

Table 4-14: Southeastern Factors affecting CP6 PPM Trajectory

The biggest changes to the CP6 PPM trajectory were associated with the impact of the removal of improvements associated with unfunded Digital Railway schemes (as instructed by ORR), and the conversion of their submission from P80 to P50. Apart from that the changes to the trajectories in CP6 appeared to be modest with the Route having adopted a conservative approach to the benefits and optimistic view of worsenments leading to a neutral impact. The optimistic view of potential worsenments was typified by the assumption that the cross-boundary services would have a neutral impact on performance.

The impact of the Thameslink timetable changes was noted to have an effect, but their impact seemed modest, and given recent experience that was considered to be an optimistic view particularly given the fact that the current Thameslink timetable was not being delivered. Similarly, changes to both franchises were recognised as having an effect but this was modest and could be a risk if franchise requirements were very different to the current agreements. In addition, the statements made regarding the impact of trespass and fatalities appeared to represent a threat to future delivery ("no longer recoverable"). However, they had only a modest impact on the performance attached to them.

The previous review found the model used by the Route to be probably the most sophisticated of those encountered during that review. There was strong evidence to support the Route assertion that there had been engagement with the TOC over the revisions and this had undoubtedly fed into the model. However, the quantum of the resulting impacts appeared low.

There was confidence in the approach that had been taken to assess and quantify the changes that had been made to the trajectory. In terms of the output trajectories the Reporter had reasonable confidence in the profile in net terms.

4.6 Wales Route

4.6.1 CP5 Exit

The PPM MAA for the single Wales Route TOC was 92.5%. The Route had assessed that the PPM figure for the end of CP5 would be 91.8%. This had been derived through the consideration of around twelve factors. The most significant benefit came

from improvements in the Command and Control organisational changes (+0.19%). Negative impacts were derived from:

- Severe Weather risk (-0.30%);
- Fleet availability (-0.21%);
- Fleet Reliability (-0.20%);
- Autumn Delivery (-0.16%); and
- Cable Theft (-01.13%).

The assessment of the impact of these negative risks was said to have been based on recent trends in each category. The Route stated that it had "high confidence" in its ability to deliver 91.8% or higher at CP5 exit and cited 17/18 close out at 92.4% and a three-year running average of 92.2% as evidence. The Route had used a short-term forecasting model to inform the confidence levels of forecasting year end performance.

It was noted that the timetable change challenges in May 2018 had relatively little impact on train services in Wales.

In terms of engagement with the new operators of the Wales and Borders franchise there was strong evidence that the Route had met with the new TOC team on several occasions and that this was to continue. It was noted however that the Route had not been party to the operational performance plans of the bidders during the process and as such had only recently been made aware of the forecast levels of delivery contracted by Transport for Wales. Up to that point the Route had assumed a neutral effect of the new franchise. (It is now understood that this approach had been previously agreed with the ORR.)

It was noted that the Route had had limited engagement with the development of the performance plans of the new franchise bidders and had therefore to make an assumption of a neutral effect pending the outcome of the franchise competition. There was good evidence that the Route had undertaken a thorough review of its current position and used experience to forecast to the exit of CP5. The contents of the make-up of the path from current performance to the end of 18/19 appeared comprehensive and well founded.

Based on the available information there was high confidence in the Route's ability to achieve the forecast CP5 exit level of performance.

4.6.2 CP6 PPM Trajectory

There were significant changes taking place to the train services in Wales over the course of CP6. The new operator plans the early introduction of new rolling stock to replace the entire fleet which was likely to be of an innovative design. The Valley Lines would be removed from Network Rail control and passed to the franchise holder. There would be a new bespoke train performance regime introduced and the frequency of services on the Valley Lines and other Routes in Wales would increase.

All the foregoing made the forecasting of performance on the Route a challenge.

Across CP6 the Route had forecast that performance for the franchise would improve from 91.8% to 92.1%. This assessment had been undertaken based on a bottom-up assessment of the factors considered to influence delivery.

Against this background of volatility, the Route had identified five significant factors that would dictate the CP6 performance PPM trajectory. The following table summarises these.

Factor	Impact	Comment
RAM Plans		This was the net effect of several cross-discipline initiatives with
Operations Strategy	+0.09%	Driven by benefits from TMS, SIO organisation and operational effectiveness
TOC Improvements	+0.22% net	
Traffic Growth	-0.10%	
Passenger Growth	0.05%	

Table 4-15: Wales Route Factors Affecting CP6 PPM Trajectory

There was a lot going on in the Route and this led to a high degree of uncertainty about future performance levels. The Route had adopted a structured and logical approach which might be appropriate for a steady state railway but may miss the mark in terms of what was required here. There was an acknowledgement of the uncertainty surrounding the new franchise and some attempt had been made to dampen down the benefits from the new rolling stock. However, this may not have gone far enough given the innovative nature of the new rolling stock and the challenging delivery times the TOC had planned. Equally, there was little evidence that the bedding-in time for the new rolling stock had been considered.

As a further risk, there was no evidence that the impact of the electrification of the GW mainline and the cross-border effect had been included in the plans.

It was stated at the meeting by the Route that there were a significant number of risks but equally lots of opportunity with the new infrastructure that was planned. In principle the Reporter agrees with this assertion however there was no evidence that the likely disruption, which new infrastructure would inevitably bring, had been considered in the plans.

The Reporter was not clear on the status of the deployment of the Traffic Management system, which will undermine achievement of trajectories / targets if not deployed as planned.

Based on the foregoing the Reporter had some confidence that the CP6 PPM trajectory would be achieved. It was noted however that this was a particularly volatile set of circumstances in the Route and it would be difficult to generate high levels of confidence given that environment.

4.7 Wessex Route

4.7.1 CP5 Exit

For South Western Railway for which Wessex were lead Route the Network Rail position for their forecast exit position for CP5 was: 86.5% PPM MAA based on the 2018/19 plan circulated in the National Task Force, against a TOC franchise requirement of 91.61% PPM MAA, a gap of circa 5%. This was considered a significant variance.

The Route stated that their CP5 year five values as:

- Floor: 82.7%;
- Forecast 86.5%; and
- Upper 89%.

It was recognised that performance had declined through CP5; PPM for SWR had seen a drop over the past seven years of 0.7% per annum:

- 0.3% of this decline could be attributed to passenger growth the remaining; and
- 0.4% was attributable to several categories including an increase in sub-threshold delay.

The Grand Southern Railway (Alliance Rail Open Access) proposals to run services between Southampton and Waterloo were declined by the ORR during the review period. This removed services from the train plan, and therefore increased theoretical network capacity, and potential performance.

The modelling of the data inputs was credible, noting for example the Route expected several significant performance incidents annually. The gap between Wessex Route and SWR was not considered likely to be closed.

The analysis through CP5 was detailed, and the Route was confident in their submission. There was therefore a high level of confidence in the Route's ability to achieve the forecast CP5 exit level of performance.

4.7.2 CP6 PPM Trajectory

The overall picture was one of performance decline, but the modelling of the data, inputs and assumptions were credible. During the meeting, under questioning from the Reporter regarding the credibility of including TOC initiatives in the CP6 PPM trajectory, the Route indicated that they would withdraw the new rolling stock and traincrew initiatives from their model. This was because they had a lack of confidence in the TOC delivering on performance improvements. However, some TOC led initiatives were to remain in the model. Whilst there was broad agreement between TOC and Route, and there is evidence of collaboration on the CP6 trajectories, there were points of disagreement – stemming from the TOC Franchise Agreement performance targets and the reality the Route believes was credibly possible.

The Route stated that a series of performance initiatives would be taking place over CP6 to mitigate any further performance decline in these categories over CP6.

The CP6 forecast performance was around the 87% PPM per annum figure. This was adrift of the franchise target for SWR which showed a steady increase to 92.5% PPM at the end of CP6.

The biggest contributing factors to performance stasis on the Route were external / severe weather autumn and structures / track. It was noted that all of these were within the control of the Route.

The approach taken by the Route to promulgate the CP6 PPM trajectory was pragmatic, realistic and evidence based using rigorous analysis, including statistical modelling and various forms of regression analysis. The Route stated a series of performance initiatives would take place over CP6 to mitigate any further performance decline in these categories over the Control Period. However, performance has been forecast to remain largely static.

The input presented by the Wessex was credible and the Route will meet the targets it set. However, it was recognised that there would always be a disagreement with the franchisee, until the franchisee's targets were reset to a more realistic level, or the Route found other sources of funding to close the performance gap.

Based on the foregoing the Reporter had a high level of confidence in the PPM trajectory.

4.8 Western Route

4.8.1 CP5 Exit

For the Western Route, for which Great Western Railway is the lead operator, the Network Rail position for their forecast exit position for CP5 was: 87.6% PPM MAA based on the 2018/19 plan circulated in the National Task Force, against a TOC franchise requirement of 91.71% PPM MAA. This was a gap of 4.1%. This was a significant variance however it was noted that GWR agreed with the Route position.

The modelling suggested a year end PPM MAA of 85.1% with a maximum of 86% should all period targets be delivered.

There were noted to be residual risks at the close of CP5 regarding:

- GWR new fleet deployment;
- Network Rail major projects delays around Oxford; and
- GWR traincrew.

The modelling of the data inputs was credible, however the performance model in operation by the Route was the First Group Bid Team model. It was considered that this might import some unintended optimism bias if not taken into account in the downstream process. It did however demonstrate Route engagement with the leading TOC.

There was a stated change in the confidence in the performance model outputs, from 80% to 50% during the meeting with the Route. This meant that the Route was as likely to meet its target as not. This shift during the meeting gave the impression that the Route was unclear whether it would meet the forecast target. The study therefore had low confidence in this output.

4.8.2 CP6 PPM Trajectory

GWR and HEx had agreed the start point for CP6. GWR aspired to 90.6%, which was within the range of the Route PPM trajectory, but did not align directly. Whilst both GWR and the Route agreed the trajectory it placed a burden on both Route and operator to deliver a higher target in a shorter period to meet the CP6 exit.

The Route had met with GWR on 22 June. As a result, it was identified that changes would be introduced later than previously expected resulting in the re-profiling of the PPM trajectory. This included such elements as the TOC and unions agreeing to include Sundays in the working week. Other risks were also identified including Wales electrification.

During the meeting with the Route the Reporter challenged the assumption of traincrew delivering performance improvements. This was as a result of the fact that the scope of the planned changes had not been delivered. It was also noted that the new fleet was also recording higher failures than had been anticipated. With the removal of the 'fall back' options of the use of HSTs it was considered that there could be a risk that CaSL figures would increase, promulgated by fleet failure. The planned TOC employee culture change programmes improving stated operational performance attracted a degree of scepticism.

The Luminate Traffic Management System integrated in the IECC scalable upgrade operating on the Great Western Mainline should deliver performance improvements via improved service recovery and operating decisions in the interest of PPM. However, it was not included in any performance trajectories as it is on a one-year trial. This was considered to be conservative. The TOC was not capitalising on the traffic management available by converting any of the in-cab Driver Advisory Systems to receive traffic management data. Therefore, the effects would be limited. There are clear benefits to be enjoyed when TOC and Route systems are integrated. However, this did not appear to feature in the forecast.

The Reporter considered that there remain too many variables in the PPM trajectory and thus had only reasonable confidence of the outcomes.

4.9 FNPO Trajectory

The study undertook a desktop review of the FNPO performance trajectory covering both passenger and freight operators. A meeting was then held with the FNPO Route team to discuss their considered key deliverables for performance. The FNPO team is a 'virtual Route' as it focuses on freight, passenger charters, Caledonian Sleeper and CrossCountry, with the latter the most high-profile passenger operator.

- The CrossCountry franchise crosses most if not all Routes, and therefore the collaboration between routes was highlighted.

- The freight operators are reported by the FNPO team as having a positive and collaborative relationship, with some documentary evidence provided.
- The Caledonian Sleeper operates on Scotland and LNW Routes.
- Similarly, the Charter operators were reported as having a positive and collaborative relationship with the virtual route.

4.9.1 CrossCountry

Whilst there was an understanding that CrossCountry was the principal operator on the FNPO Route, there were a number of issues considered to require follow up to ensure that there was clearer understanding regarding FNPO contribution to CP5 exit and CP6 profile positions.

There was tangible evidence of engagement with both Western and Wessex Routes to ensure that 'right time' at Reading was achieved. However, there was little evidence that this approach was being adopted with other Routes. In particular, with LNW/Western around Aynho Junction for Banbury; nor on Anglia Route.

It was noted that whilst the number of CrossCountry cancellations remained better than target, there was no evidence of a longer-term performance plan for the operator. This was contributed to be franchise uncertainty.

4.9.2 Freight

The revised approach to recording the Freight Delivery Metric (FDM), which represents a clearer picture of actual performance and where delays should be attributed and thus investigated, was considered to be a positive step.

4.10 Route Model Assessment

4.10.1 Introduction

Each of the Routes developed their own approach to the forecasting of the PPM trajectory for CP6. The following text provides a summary of the models that were interrogated for each Route.

4.10.2 Anglia Route

Anglia had developed a bottom up model which was based on historical performance in conjunction with informed assumptions associated with future initiatives. Following the previous Anglia model review, amendments had been made to check the performance trajectories. These amendments were to provide a model in a more auditable format with a revised methodology to allow PPM failure changes to either be 'one-off' in-year impacts, or to accrue cumulatively.

Anglia provided a copy of their 13th July submission revised CP6 PPM trajectory model along with an update of key assumptions made. In response to the previous review, Anglia had resolved model errors and applied passenger growth based on TOC characteristics:

- ARL subject to a one-off impact based on 1.97% Anglia growth assumption as new fleet would mitigate passenger growth through increased capacity and configuration.
- GA was subject to cumulative passenger growth based on the 1.97% Anglia growth assumption. Capacity from new fleet, service pattern changes from new timetable and significant operational changes through the NEAT programme indicated that a cumulative growth approach was applicable.
- MTR had been subject to cumulative growth based on 1.97% Anglia growth assumption, which levels out by end of CP6. Anglia indicated that passenger growth of 200 million annual passengers was planned and at this time, the base timetable for the Elizabeth Line service was expected to be sufficient for all passenger growth needs during CP6.
- c2c passenger growth impact was excluded from the Anglia model. Anglia indicated that modest passenger growth of around 2% per year was anticipated for CP6, in comparison to approximately 5% per year during CP5. c2c was taking a continuous improvement approach to growth management in particular managing dwell times in conjunction with the assumption that new rolling stock service and service pattern changes would mitigate the impact of passenger growth, particularly from the Barking Riverside development that is scheduled for 2021.

4.10.3 London North Eastern & East Midlands Route

LNE&EM adopted a bottom up, quantitative approach to forecasting. The trajectories remained unchanged from the SBP. This was confirmed during discussions with the Route that no change has been made to the input assumptions. The TOCs had been engaged throughout the process although none of the lead TOCs for this Route had signed off on the CP6 trajectories. Further information to clarify where the differences in views lie between LNE&EM and the TOCs was not forthcoming.

Discussions indicated that LNE&EM had a thorough appreciation of the challenges and opportunities that apply to their Route. The Reporter had concern in relation to the consistency of treatment of delay which was reflected in their modelling. For example, the Route had allowed for risk associated with adverse weather on infrastructure performance but no allowance had been for TOC related weather impacts. This Route has a history of suffering from severe weather conditions and thus such an omission reduced confidence in the PPM trajectory.

4.10.4 London North Western Route

No changes had been made to the model since the submission of the SBP. Full sign-off of the CP5 exit and CP6 trajectories had been achieved only with Merseyrail, although VWC had agreed to the SBP CP5 exit figure. A request for information summarising the difference of opinions between LNW and the TOCs was requested, but had not been made available.

LNW adopted a bottom up approach to the modelling which was heavily reliant on consultation with their five lead TOCs. The forecasting approach was based on an

iterative process focussed upon data, knowledge, experience and judgement. Review of existing data allowed current and recent performance trends to be used to inform risks and opportunities for CP6. The Route forecast was then considered against the TOC aspirations.

The approach adopted remained inconclusive with four of the five TOCs with gaps remaining in predicted performance. A sense of difficulty was clearly communicated in relation to the availability of information for planned CP6 interventions by the TOCs. Examples of unknowns included uncertainty associated with early stage planning of the West Coast Partnership or the recent WMT franchise change. The qualitative, highly iterative approach to forecasting performance might have worked against the Route as a more quantitative approach would have provided better evidence to support Route projections during consultation with stakeholders.

LNW models supporting the submitted CP6 performance trajectories were provided for review.

4.10.5 South East Route

The South East model was a well-structured model that was associated with many assumptions. The SBP CP6 trajectories were based on a P80 level of confidence which the South East were asked to revise to reflect the P50 level of confidence assumed by each of the other Routes. In addition, changes had been made to input data as well as some of the considered assumptions for example 'Digital Railway' had been removed from the model due to the level of uncertainty associated with the emerging technology. Other changes included the phasing of Southeastern trains to tally with the GTR timetable.

The developed model was complex and required a high level of knowledge to ensure meaningful outputs were generated. Consideration of altering an input, such as extreme weather impacts (average historic trends have been utilised regarding extreme weather events in recent years as one-off occurrences), was more complicated than within some of the simpler models developed on other Routes.

4.10.6 Wales Route

Wales was the lead TOC for Arriva Trains Wales (ATW) and the new franchise which was awarded in June 2018 to Keolis Amey (KATW). Wales Route had worked closely with Transport for Wales (TfW) to gain a comprehensive understanding of the new franchise and its obligations and targets.

The CP6 performance model was based on a bottom up method that quantified each initiative in turn, using statistical forecasting methodology to inform target setting. The Route was happy with the baseline however, improvement plans developed by the franchise bidders had not been shared. As a result, the Route was revisiting their CP6 trajectories via a change control process with ORR, to understand the change in performance opportunities and risks associated with the new challenge.

The bottom up approach to the modelling provided the CP5 exit points but would need to be revised to reflect the new franchise. During engagement with the Route they had not yet seen outputs from the KATW bid model. Consequently, the key challenge

faced by the Route was to understand the performance impact of KATW, in particular how performance impacts would be spread through CP6. The Route would need to critically consider phasing of the KATW initiatives to establish realistic benefits and opportunities for the revised PPM trajectory.

Wales provided a copy of their updated CP6 performance trajectory model for review. Comparison of the fishbone diagrams submitted in support of the SBP and the Route response to the Draft Determination the distribution of improvements (betterment and worsenment) changed by 0.01pp. This difference related to the summary of the most recent submission being rounded to one decimal point as opposed to two decimal points as included in the SBP.

4.10.7 Wessex Route

The CP6 PPM forecasting model was based upon identifying the long-term trends in PPM.

Extreme weather was not included as an identified risk within the CP6 PPM trajectory as it was incorporated as part of the baseline forward trajectory as an underlying trend. Similarly, large incidents were retained within the baseline information.

A copy of the updated model had been reviewed, and clarification had been requested in relation to some input values as there appear to be some inaccuracies within the model received.

The model was well-structured but did not appear to be completed. As a result, it was anticipated that a further review would be required. However, given the assumptions presented, the CP6 trajectory figure was likely to increase. For example, benefits associated with fleet improvements had not been incorporated in the model and therefore were not reflected within the CP6 trajectory.

4.10.8 Western Route

Both GWR and HEx had accepted the CP5 exit figure generated by the Western model. However, they had not reached agreement in relation to the CP6 trajectories.

The Western model was based on a bottom up plan and used the Route's Business Plan. Applied to the base model were a range of assumptions associated with ongoing enhancements in the Route (e.g. Crossrail and HS2) as well TOC related initiatives such as fleet improvements.

Since the 13th July submission, further discussions were held between GWR and the Route to address several assumptions relating project timing, anticipated start dates, and timescales to revise the CP6 PPM trajectory. This appeared to be representative of TOC engagement; that Route has adopted an iterative process to determine performance related opportunities and risks. Discussions indicated that Western had relied on the GWR bid model to derive its CP6 trajectory, which was considered to provide an optimistic outcome. Evidence that the Route had challenged the initiatives would have been desirable, for example the fleet and traincrew assumptions by GWR were optimistic.

The Route appears to have trusted the TOC model and may have been too accepting of the associated opportunities and timescales. Engagement with the Route suggested that they might not have challenged the TOC inputs to their model sufficiently. An awareness of possible issues with the model was reflected in the opportunity offered by a change in staff which would allow a new Route team member to review the model. As a consequence, further changes to the CP6 PPM trajectory were expected beyond the assumption revisions being discussed with GWR.

4.10.9 FNPO Route

No performance model was provided for review by FNPO. A waterfall diagram for CrossCountry was provided however no detail or methodology for the Route's approach to assessing the likely impact of changes across CP6 was shared.

4.10.10 Scotland Route

A model was not provided by the Scotland Route for review.

4.11 Asset Sustainability

4.11.1 Introduction

The ORR Draft Determination proposed the investment in additional asset works to improve the sustainability of Network Rail's asset portfolio. This amounted to some £933m to be split between the England and Wales Routes. £67m was allocated to Scotland Route.

4.11.2 Analysis

The following table summarises our assessment of the respective Route approaches based on the review of the individual Asset Sustainability submission documents and views shared at the Route meetings.

Route	Approach and Commentary
Anglia	
LNE& EM	The submission was very focused on sustainability with workbank activities that had
LNW	The scene-setting of the submission provided a clear account of the way in which the option identification had been undertaken. Within the descriptor of the earthworks schemes there was reference to performance benefits. With the exception of the high criticality earthworks schemes which had been identified as having a 'significant' performance impact, all of the other ten options had only "marginal" or no operational performance impact. There was a short descriptor of the justification for the qualitative assessment but no attempt to measure the impact.
South East	There were four packages of activity split between track and structures in the submission. It was noted that "The asset sustainability and train performance benefits have been quantified using the 'STE Track Sustainability' model". It was not clear why this was the only Route to have used this approach to performance (or have identified that this was their approach). The use of this model allowed the Route to evaluate the performance impacts in terms of reductions in SAFs both in CP6 and CP7 as a result of the work. The impact from the structures interventions was linked to the avoidance of disruption costs; these were quantified in some detail. It was assumed that these figures had been derived from direct experience.

Wales	In the scene setting justifying the selection of options to be delivered under the Route's spending allocation there was no mention of performance at all. The approach to the assessment of performance benefits for each of the schemes varied. For the drainage schemes an assessment had been made of the performance benefits quoting, for example, a 4% reduction in SAFs, representing around £57k in Schedule 8 payments. The evaluation of the SAF impact was not described and needed to be explained. For the track and geotechnical options, the stated assessment of performance benefits was purely qualitative with no justification of how the assessment had been made. The structures scheme benefits were linked to the delay minutes from forecast projections with the quantification of delay minute benefits attributed to historic impacts.
Wessex	The submission was very focussed on necessary track and earthwork schemes which were believed by the Route necessary to recover degrading sustainability in these two critical areas. The identified four key objectives used to define the prioritisation of works did not include performance. The two track packages were measured in terms of performance benefits by the reduction in the number of TSRs/ESRs plus the removal of sites at risk of speed restrictions. Whilst the former was quantifiable the de-risking was less so. For earthworks the benefits were noted as "minimising the risk of needing to use operational restrictions to manage safety … avoiding unplanned service affecting restrictions". This seemed reasonable but difficult to quantify.
Western	The selection of options for delivery was noted as being based on "a balanced programme across our asset base". This picked up on the schemes which the Route had identified in its RSP submission but had dropped out due to funding constraints. In terms of priority it was noted that the track schemes were linked to improvements in SAF / FWI risk. Within the individual option descriptions there was a mixture of approaches to the assessment of performance impacts depending on the engineering discipline. The track options were specifically linked to their impact on the "long-term asset forecasting projection of SAF / year" leading on to an assessment of delay minutes and PPM failures. The impact for the structures proposal was quantified based on recent relevant delay minutes experience. A signalling scheme in Cornwall had been assessed in a similar fashion. The performance impact of the level crossing, drainage, earthwork, fencing, and building schemes were all assessed qualitatively based on a short description.

Table 4-16: Commentary of Route Asset Sustainability Outcome

Whilst Network Rail's Asset Sustainability Summary document was precise about the share of the funding and the impact this would have – see below:

	Additional CSI improvement from extra sustainability spend - end CP5 vs end CP6							
	Anglia	LNE	LNW	South East	Wales	Wessex	Western	E&W Total
Total	0.41%	0.64%	0.34%	1.06%	0.92%	0.76%	0.74%	0.62%

Table 1.1 Route summary of additional CSI improvements achieved by additional sustainability spend

Figure 4-1: Share of Additional Investment for Asset Sustainability

It was clear from the Route engagement meetings that there remained some doubt about the share each were going to receive, and thus whilst some had put some effort into making an assessment of the impact on performance none were prepared to add it into their trajectories because it was not considered as having been 'confirmed'.

Treatment of the additional investment in sustainability was considered disappointing throughout.

4.12 PPM Trajectory Confidence

4.12.1 Introduction

This sub-section provides the Reporter's summary assessment of the review of available information up to 30th August (i.e. before the final submissions). It presents a view based on the combination of the elements described previously in Section 4.

4.12.2 Analysis

The outcomes of the review described in the earlier part of this chapter have been combined into a single view of confidence in the Route forecast. This view, along with a justifying commentary, is provided in the following table.

The assessment should be read in conjunction with the two Technical Notes issued before and after the Route meetings and which contain more detail on the Reporter's view on the various elements of the trajectories. These Technical Notes are included as Appendices G and H.

Route	Commentary	Confidence
Anglia	There is Low Confidence in the Route PPM trajectories since it recognised the July submission to be a 'work in progress' with re-profiling of the PPM trajectory to take account of severe weather effects still being worked on. The immediate impact of this was to present a poor view of their ability to achieve CP5 exit forecasts. Risks to the trajectory came from the impact of passenger growth and the potential performance impacts of the Crossrail services. Concern regarding the accuracy of the modelling compounded uncertainty over the overall PPM trajectory. There was also concern that the mechanics of the model which had been previously highlighted in the Reporter review undertaken in early 2018.	We have low confidence in the proposed PPM trajectory
LNE& EM	There was strong evidence of a structured approach to the development of the CP5 exit PPM trajectory but there was weakness in the engagement with the TOCs in terms of the evidence provided and progress with reaching agreement on forecasts. In particular the step-change between current performance levels and the forecast exit level appeared challenging. The use of the bottom up approach to the modelling had merits. Detail of the approach used to develop the trajectory in CP6 was not shared and thus it was not possible to confirm the robustness of the quantification of the impacts.	We have some confidence in the proposed PPM trajectory
LNW	Whilst there was a well-structured approach evident from the Route with strong evidence of TOC engagement it was considered that there was some doubt concerning their response to recent poor performance and from that the confidence in their ability to hit the forecast CP5 exit levels. However, the quantification of the elements in the PPM trajectory were based on sound experience. Modelling, which was reported to not have changed, was considered fit for purpose in the first round of reviews. This remained the view.	We have high confidence in the proposed PPM trajectory
Scotland	This Route was not reviewed	
South East	To reach the CP5 exit forecast there were concerns regarding the treatment of severe weather impacts and the approach to treatment of trespass and fatalities. This was countered by a high level of engagement with the TOCs and a sophisticated forecasting model. Within CP6 the trajectories showed only modest variation and this appeared to be due to pessimistic view of benefits and optimistic view of worsenments.	We have reasonable confidence in the proposed PPM trajectory
Wales	There was a lot of uncertainty in the Route with the new franchise taking over the dominant TOC, and adjacent electrification schemes penetrating from the east. The Route had not been sighted on bidder operational solutions and had been advised to assume no impact. The structure of the approach to reach CP6 appeared well founded. However, within the new Control Period there was concern regarding the TOC initiatives (introduction of novel rolling stock) and the removal of portions of the Route to the TOC. Whilst the core model was accepted the 'minor' changes this may not have been reflective of the significant risks in the new control period.	We have some confidence in the proposed PPM trajectory
Wessex	Wessex was another single TOC dominated Route. Performance was in decline however there was high confidence in the Route's ability to achieve the CP5 exit figures on its PPM trajectory. This confidence continued through the years of CP6 where it was considered that the data, inputs and assumptions associated with the model were credible. It was however noted that the performance forecast was significantly different to the franchise requirements.	We have high confidence in the proposed PPM trajectory

Western	The Route was impacted by the work on the Great Western main line electrification. This together with the introduction of the associated new rolling stock presented a risk which the Route was well aware of. In terms of their trajectories it was considered that there were significant variables at play from both the TOC and Route leading to the view that there was reasonable confidence in the overall trajectory. The reliance on the TOC model made the forecasting of performance optimistic.	We have reasonable confidence in the proposed PPM trajectory

Table 4-17: Initial Reporter View of PPM Trajectory Confidence by Route

Based on the foregoing analysis an assessment was made of the Reporter's view of the PPM applicable to each of operator compared to the trajectory forecast by Network Rail. This is illustrated in Figure 4-2.

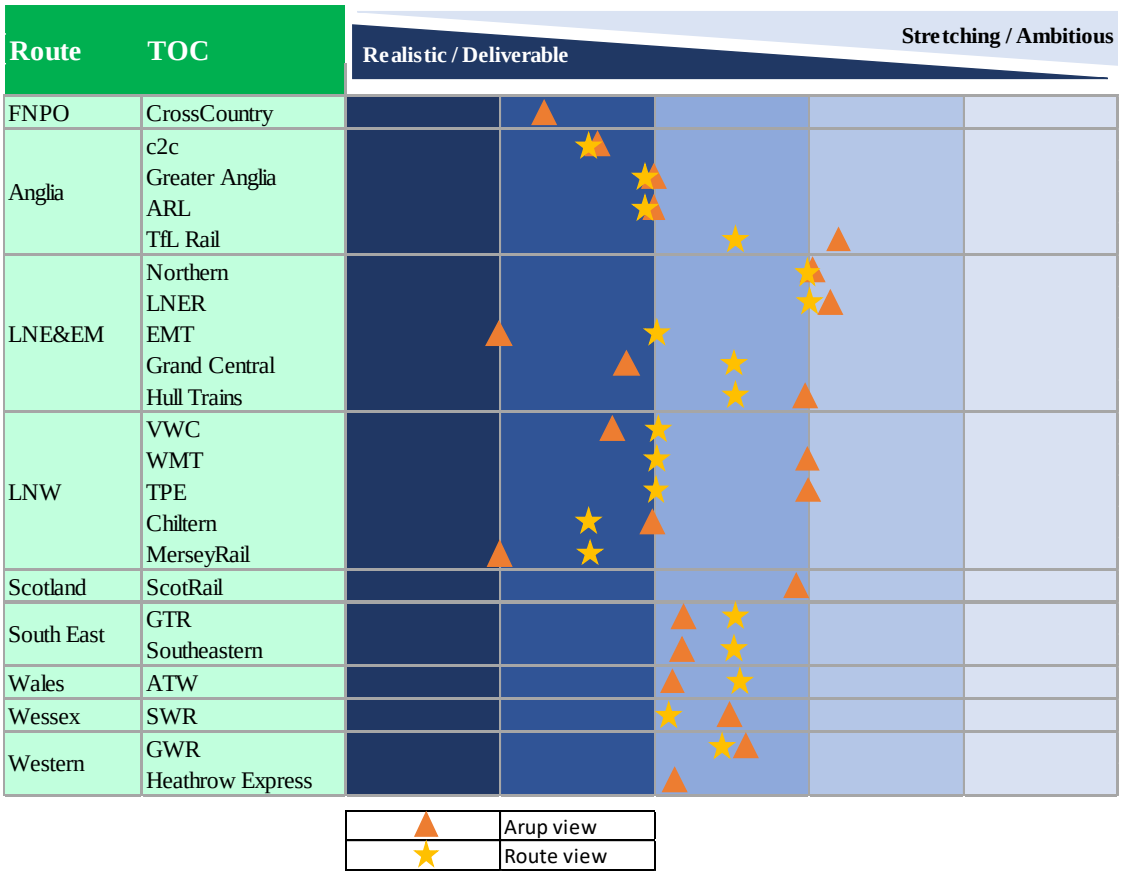

Figure 4-2: Initial Reporter View of PPM Trajectory Delivery for each Operator

5 Engagement with Operators

5.1 Introduction

It was recognised that the whole process associated with the development of performance plans and trajectories for CP6 was predicated on a meaningful and effective stakeholder engagement between Network Rail and the operators. The dialogue with Network Rail provided a view of the engagement that had taken place throughout the process of the development of the performance trajectories. This demonstrated a diversity of approach to this engagement. As part of the evidence gathering the study communicated with a number of operators who it was considered would provide a cross-section of views on the process. This Section of the report describes the process and findings from the operator engagement.

It should be noted that feedback from the operators was reviewed after the submission of the Interim Report finding.

5.2 Approach

A prime focus for the review, as defined in the Mandate, was to understand the interaction between Network Rail and the TOCs and FOCs during the process to assess the performance trajectories for CP6. During the course of the review it was established that input from operators took place to varying degrees at different stages of the Draft Determination response process, namely:

- Contribution to the process through the PR18 process;
- Direct engagement with Network Rail during the period where they were revising the trajectories ahead of 13th July submission; and
- Post 13th July engagement.

As well as reviewing the submissions from the Routes where evidence of operator engagement was identified the review, based on the findings of the discussion with the Routes, undertook direct engagement with selected TOCs. The selection of TOCs was designed to link to operators that had been highlighted during the Route engagement process as being of particular interest. In addition, it was considered important to try to engage with a range of operators to obtain a balanced view from their perspective. In light of the challenging timescales, the geographic spread of the operators, and the quantum of TOCs it was agreed that engagement should take place by means of a questionnaire sent to key individuals in the TOC. The focus of the questions was derived from the earlier meetings with the Route teams and took account of the NTF inputs. The same questions were asked of all TOCs; these are shown in Figure 5-1.

1. What engagement in the process to set a value of the CP5 performance exit level and the trajectory through CP6 has taken place between your TOC and Network Rail?
2. What level of performance do you believe your TOC will achieve at the exit of CP5 and does this agree with the value Network Rail has calculated?
3. What TOC initiatives are in the plans to allow the achievement of the forecast CP5 exit level and what contribution is each of these assumed to make in terms of improvements and what level of confidence do you have regarding their delivery?
4. What trajectory of performance do you believe your TOC will achieve during CP6 and does this agree with the value Network Rail has calculated?
5. What TOC initiatives are in the plans to allow the achievement of the forecast trajectory and what contribution is each of these assumed to make in terms of improvements and what level of confidence do you have regarding their delivery?
6. What risks remain in the current trajectories in so far as your TOC is concerned and how have these been agreed to be dealt with by Network Rail?

Figure 5-1: Questions Raised Directly with TOCs

The responses received by the Reporter to this approach are summarised in Table 5-1 below.

TOC	Response
c2c	No response
Chiltern Railways	Received
CrossCountry	Received
East Midland Trains	No response
Grand Central	No response
Greater Anglia	Received
GTR	Received
GWR	No response
Keolis Amey	Received
LNER	Received
Merseyrail	No response
MTRC	No response
Northern Railway	No response
Southeastern	Received
SWR	No response
TPE	No response
VWC	No response
WMT	Received

Table 5-1: TOC Response Rate to Reporter Engagement Questionnaire

5.3 Engagement Outcome

Based on the feedback from responding TOCs, and input from the Route meetings a view was reached over the deliverability of individual operator performance improvement proposals. This was based on:

- The view of the Network Rail / TOC engagement;
- The TOC view of their own performance and its alignment with the trajectories developed and offered by Network Rail for CP6;
- TOC initiatives; and
- Performance risk mitigation.

The following table summarises these responses. A more detailed account of the TOC input is included in Appendix D.

TOC	Response
Chiltern Railways	Chiltern believed that the Network Rail trajectory was not sufficiently ambitious.
CrossCountry	Operator offered the view that transparency in the process could be improved.
C2C	The strategic performance narrative documents produced by Network Rail had not been signed, however a number of meetings with the Route had been held. Operator offered the view that transparency could be improved.
Govia Thameslink Railway	Trajectory process had been agreed but the targets had not. The operator lacked confidence in Network Rail's delivery.
Greater Anglia	GA stated that Network Rail had shown minimal interest to feed through any performance benefits associated with new initiatives, and had reflected these only in terms of risk and no associated benefit.
Keolis Amey (Wales)	The operator was awarded the franchise in May/June 2018. They confirmed that they were engaging with Network Rail and that a detailed CP6 strategy would be ready by 31st March 2019.
London North Eastern Railway	Operator and route were broadly aligned regarding the negative impacts of the May 2018 timetable changes but the lack of visible recovery plan from Network Rail was a concern. It was acknowledged that fleet replacement and other improvements proposed by the operator would be challenging to realise.
Southeastern	The operator accepted and supported the methodology adopted by Network Rail.

West Midland Trains	WMT were very concerned about the significant risk associated with HS2 throughout CP6. The operator's view was that the benefits of their PIP schemes should be reflected within their trajectory. Network Rail's CP5 exit position had not been discussed or agreed.

Table 5-2: Summary of TOC Response to Reporter Engagement Questionnaire

Whilst not completing the questionnaire issued as part of this process the following input was gleaned from the following operators:

- Northern Rail – trajectory did not align with the franchise requirements;
- Hull Trains – only minimal discussions had been held;
- Grand Central – has had a limited engagement with the Route and has a number of concerns;
- TransPennine Express – they had signed a Supplementary Joint Performance Strategy which highlighted the performance differences with the Route;
- Virgin West Coast - they had also signed a Supplementary Joint Performance Strategy which highlighted the performance differences with the Route; and
- Great Western Railway – had signed off on the first two years of CP6.

6 Revised Findings

6.1 Introduction

On 31st August 2018 Network Rail submitted a formal response to the Draft Determination. This was followed up by a final submission from Network Rail on 14th September which represented the final input to the review. The September submission updated a small number of the PPM trajectories. In addition, dialogue with a number of the Routes continued in the first half of September associated with their models.

All the foregoing was taken into consideration in the Reporter's assessment of the overall Network Rail response. This second review was focused on the changes that had been made by the Routes between the interim submission in July and the final trajectories. This view on the changes was further informed by the feedback received from operators following the issue of a questionnaire.

This Section of the report describes the scale and impact of the changes to the trajectories and any revision to the views on the confidence in the submission.

6.2 Changes to Previous Submission

The finalised submission from Network Rail arrived once the review had prepared its initial findings in the Interim Report. The Interim Report took account of the documentation review, the engagement with the Route teams at the series of meetings, and the examination of the models prepared by each Route to generate their trajectories.

Consideration of the follow-up submission was based on a review of the differences that had been identified when it was compared to the July interim submission, and the input from operator engagement that had taken place after the Interim Report submission.

Network Rail produced the following table which showed the changes to the trajectories based on their 14th September submission.

Changes between submissions are depicted in red (worse) or green (improved)
Changes made in response to evidence provided during operator engagement, or in response to current performance challenge
GTR and Southeastern shown at the P50 across all three submissions (the Route plans were submitted at P80 for the SBP but calculated at P50 to determine the national PPM trajectory)

Operator	Original SBP Submission February 2018						Interim Submission 13th July 2018 Highlighting Variations to Original SBP Submission						Final Submission 14th September 2018 Highlighting Variations to Interim Submission					
	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Arriva Trains Wales	91.8%	91.9%	91.9%	92.0%	92.1%	92.1%	91.8%	91.9%	91.9%	92.0%	92.1%	92.1%	91.8%	91.9%	91.9%	92.0%	92.1%	92.1%
c2c *	95.6%	95.5%	95.5%	95.7%	95.6%	95.6%	96.2%	96.1%	96.1%	96.3%	96.2%	96.2%	96.2%	96.2%	96.2%	96.2%	96.2%	96.2%
Caledonian Sleeper	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%
Chiltern	93.8%	93.8%	93.9%	93.9%	94.2%	94.3%	93.8%	93.8%	93.9%	93.9%	94.2%	94.3%	93.8%	93.8%	93.9%	93.9%	94.2%	94.3%
Cross-country	90.0%	90.0%	90.0%	90.1%	90.2%	90.3%	90.0%	90.0%	90.0%	90.1%	90.2%	90.3%	87.0%	86.4%	86.8%	86.5%	85.9%	86.1%
East Midlands Trains	91.7%	91.1%	90.8%	91.0%	91.2%	91.3%	91.7%	91.1%	90.8%	91.0%	91.2%	91.3%	91.7%	91.1%	90.8%	91.0%	91.2%	91.3%
Grand Central	85.4%	83.5%	85.0%	85.0%	85.0%	85.0%	85.4%	83.5%	85.0%	85.0%	85.0%	85.0%	85.4%	83.5%	85.0%	85.0%	85.0%	85.0%
Great Western Railway	87.6%	88.2%	88.5%	88.8%	89.0%	89.2%	85.1%	85.7%	86.5%	87.8%	88.8%	89.2%	83.7%	84.5%	85.5%	87.1%	88.8%	89.9%
Greater Anglia	89.6%	89.0%	89.2%	89.2%	89.2%	89.2%	89.6%	89.0%	89.2%	89.2%	89.2%	89.2%	89.6%	89.0%	89.2%	89.2%	89.2%	89.2%
GTR	83.1%	83.8%	84.1%	84.4%	85.3%	86.2%	80.9%	82.4%	82.6%	83.3%	83.7%	83.9%	80.9%	82.4%	82.6%	83.3%	83.7%	83.9%
Heathrow Express	90.8%	92.0%	92.2%	92.3%	92.6%	92.6%	90.8%	92.0%	92.2%	92.3%	92.6%	92.6%	90.8%	92.0%	92.2%	92.3%	92.6%	92.6%
Hull Trains	82.3%	84.5%	85.0%	85.0%	85.0%	85.0%	82.3%	84.5%	85.0%	85.0%	85.0%	85.0%	82.3%	84.5%	85.0%	85.0%	85.0%	85.0%
London Overground	95.2%	94.7%	94.7%	94.7%	94.7%	94.7%	94.5%	94.7%	94.9%	95.0%	95.0%	95.0%	94.5%	94.7%	94.9%	95.0%	95.0%	95.0%
LNER	83.8%	82.5%	83.2%	84.4%	85.4%	85.6%	83.8%	82.5%	83.2%	84.4%	85.4%	85.6%	75.5%	79.5%	82.5%	84.7%	85.1%	85.5%
Merseyrail	95.0%	94.4%	94.4%	94.9%	95.4%	95.6%	95.0%	94.4%	94.4%	94.9%	95.4%	95.6%	95.0%	94.4%	94.4%	94.9%	95.4%	95.6%
Northern	89.0%	89.2%	89.4%	89.8%	90.5%	91.1%	89.0%	89.2%	89.4%	89.8%	90.5%	91.1%	79.0%	83.5%	85.5%	87.4%	90.1%	91.1%
ScotRail	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	90.5%	91.5%	92.5%	92.5%	92.5%	92.5%	89.3%	90.5%	91.5%	92.5%	92.5%	92.5%
South Western Railway	86.5%	87.3%	87.6%	87.2%	87.4%	87.5%	86.5%	87.3%	87.6%	87.2%	87.4%	87.5%	83.7%	84.6%	84.6%	85.6%	86.5%	87.5%
Southeastern	90.1%	89.4%	89.0%	89.3%	89.9%	90.4%	88.3%	88.0%	88.4%	88.8%	88.9%	89.0%	88.3%	88.0%	88.4%	88.8%	88.9%	89.0%
TfL Rail	94.4%	93.9%	93.9%	93.9%	93.9%	93.9%	94.4%	93.9%	93.9%	93.9%	93.9%	93.9%	94.4%	93.9%	93.9%	93.9%	93.9%	93.9%
TransPennine Express	88.5%	88.6%	88.7%	88.8%	88.9%	89.0%	88.5%	88.6%	88.7%	88.8%	88.9%	89.0%	79.2%	82.4%	84.5%	84.9%	85.5%	86.2%
Virgin Trains West Coast	86.5%	85.9%	86.3%	86.0%	85.4%	85.6%	87.0%	86.4%	86.8%	86.5%	85.9%	86.1%	87.0%	86.4%	86.8%	86.5%	85.9%	86.1%
West Midlands Trains	88.8%	88.4%	88.8%	88.4%	88.7%	89.1%	88.8%	88.4%	88.8%	88.4%	88.7%	89.1%	88.8%	88.4%	88.8%	88.4%	88.7%	89.1%
National (indicative)	89.3%	89.3%	89.4%	89.5%	89.9%	90.2%	88.3%	88.7%	89.0%	89.3%	89.6%	89.8%	86.5%	87.5%	88.0%	88.7%	89.4%	89.7%

* A revised trajectory for c2c was received post 14th September which has been included in this table.

Table 6-1: Variations to TOC Performance Trajectories from Original SBP to 14th September 2018 Submission

The revisions to the individual TOC PPM MAA trajectories at the exit to CP5 and through each year of CP6 affected seven TOCs:

- CrossCountry;
- GWR;
- LNER;
- Northern;
- ScotRail;
- SWR; and
- TPE.

In general, all have worsened with the exception of individual years related to LNER and GWR performance. Overall the national passenger performance PPM had declined in the latest forecast for all years.

6.3 Commentary on the Revised Submission Impacts

The revision to the commentary post 31st August was based on the input the study received from the key TOCs and observations on the revised Route submissions. Comments on the modelling are included in Section 6.4.

6.3.1 Freight and National Passenger Operator Route

As part of their response to the Reporter questionnaire CrossCountry indicated minimal engagement with the Route. The CrossCountry franchise had been due for renewal in 2019 but the DfT recently announced that the franchise competition is to be cancelled pending the outcome of the Rail Review[9].

Passenger Charters remained a high-performance risk but low mileage operation and would thus have limited impact on the overall performance trajectories.

6.3.2 Anglia Route

GA stated that although their current performance improvement plans were shared with the Route, Anglia Route had shown minimal interest in feeding any performance benefits associated with new fleet and timetables into the trajectories viewing these initiatives as significant risks.

GA and Network Rail have a working joint agreement on CP6. Whilst c2c and ARL have agreed their trajectories, MTRC, and TfL Rail had been unable to agree theirs with Network Rail. This was considered to indicate a bold approach to performance risk. The Reporter therefore has only some confidence in the performance outcome.

[9] The Rail Review was announced by the Secretary of State in Parliament on 11th October 2018

6.3.3 London North Eastern / East Midlands Route

It was noted that East Midlands Trains / Hull Trains / Grand Central / Arriva Rail North: had not signed off on the National Task Force form and they did not respond to the Reporter's questionnaire. LNER stated that they believed their fleet and OLE improvement measures would be greater than has been stated in the submission.

The Reporter had some confidence in the overall LNEM trajectories. However, it was expected that the Grand Central and Hull Trains improvements should have shown greater alignment given the similarity of operation. The uncertainty of the May 2018 timetable resolution affecting Northern throughout, and LNER in Yorkshire and on the Thameslink interface, provided further uncertainty.

6.3.4 London North Western Route

Chiltern Railways responded to the Reporter questionnaire and highlighted a range of performance issues. The collaborative work by the Route and Virgin West Coast to agree an alternative trajectory was considered a very positive step. The agreement on this revised trajectory came through in a new set of figures in early September 2018 – these are shown in Table 6-2 below.

	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
VWC PPM Alternative Trajectory	87.0%	86.4%	86.8%	86.5%	85.9%	86.1%

Table 6-2: Agreed Alternative VWC Trajectory

No formal response was received from TPE however a supplementary performance strategy has been signed which provided further evidence of good engagement with a TOC. West Midlands Trains highlighted the gap between their franchise committed performance targets and the Route PPM trajectory.

6.3.5 South East Route

Southeastern TOC were generally supportive of the approach that had been used by the Route in developing its PPM trajectory. GTR indicated that it supported the Route in the way it had developed the trajectory but did not agree with the outcome. It expressed a lack of confidence in Network Rail's ability to deliver on the performance improvement plans.

6.3.6 Wales Route

Keolis Amey responded to the Reporter questionnaire and accepted the risks in their new franchise, however they appeared to remain confident in their ability to deliver their targets.

The performance changes were driven by the uncertainty around the franchise, and a more conservative approach being adopted by the Route. This stemmed from the challenges relating to the franchise changes as well as the ongoing Great Western Main Line upgrade.

6.3.7 Wessex Route

South Western did not engage with the Reporter but did provide a significant input to the CP5 exit and CP6 entry and through the CP6 PPM trajectory. However, Route confidence in the TOC's ability to deliver following Reporter challenge was reduced.

6.3.8 Western Route

Since the 13th July submission, Western Route had further revised the proposed CP6 PPM trajectory for GWR.

Network Rail Submission	2019/20	2020/21	2021/22	2022/23	2023/24
13th July	85.7%	86.5%	87.8%	88.8%	89.2%
14th September	83.7%	84.5%	85.5%	87.1%	88.8%

Table 6-3: Revised Western Route PPM Trajectory

GWR did not respond to the Reporter questionnaire, however they have agreed their trajectory and expressed their confidence in their submission via NTF and through a revised submission with Network Rail.

Heathrow Express are being subsumed into GWR and therefore did not feature in the revised submission from Western Route.

6.4 Revisions to the Modelling

6.4.1 Anglia Route

The Reporter continues to have outstanding model related queries and have asked Anglia to respond to indicate how they have handled passenger growth, however no further response was received. The outstanding issues are summarised by TOC as follows:

ARL

The planned change in passenger capacity from the May 2019 timetable change is 17.6%, whereas over the course of CP6 the forecast passenger growth is 8%. This equates to a net increase in capacity of approximately 9%. The outstanding passenger growth query relates to the interpretation of the impact of capacity and growth as logic indicates this to be a net benefit that would result in more PPM passes however, the model indicates more PPM failures. Anglia was asked to clarify but no further response has been received.

GA

The planned increase in passenger capacity was requested to allow a comparison with growth to be undertaken, as shown above for ARL.

MTRC

The Reporter remains unclear on the meaning of what passenger growth means for this operator. Specifically, how does the capacity growth versus passenger growth compare.

C2C

Model accepted, no further queries.

The Reporter does not expect the passenger / capacity growth queries raised to have a significant impact on the derived trajectories. There is therefore some confidence in the Route's modelling based on the foregoing.

6.4.2 London North Eastern & East Midlands Route

It was indicated during the Route review meetings that the LNE&EM model was being updated to reflect the revised CP6 performance trajectories. A provisional model was supplied but contained minimal information. The Route indicated the updated model would reflect the revised relationships between PPM and other performance metrics to reflect recent performance data. They describe this work as follows:

"In essence we have looked at "bouncing back" from current TT related performance issues in the first 2/3 years of CP6, therefore, we are creating a new set of regressions based more closely on performance since P1810. The latter years of CP6 will then return to our original regressions."

During the period between the 13th July Draft Determination response and the final submission in September, LNE&EM revised the CP6 trajectories for both Northern and LNER.

For Northern a revised waterfall diagram was submitted for review however, insufficient supporting information was supplied to allow a meaningful comparison of the CP6 trajectory build up to be undertaken. No information was received to support the revised LNER PPM trajectory.

Insufficient modelling evidence submitted to support proposed CP6 trajectories resulted in a low confidence in the Route's modelling.

6.4.3 London North Western

The operator trajectories and supporting models, for Merseyrail, Chiltern and WMT remained consistent with those included within the SBP submission. Changes were made to VWC and TPE. These are summarised below:

VWC

Since the SBP submission, LNW and VWC worked on an 'alternative' trajectory, which was submitted in the response to the Draft Determination on 31.08.18. The sole change made, was based on the confidence of VWC that they had resolved the industrial relation issues which had caused significant impacts in 17/18. As a result, the Route included a 0.5pp benefit into the CP6 PPM trajectory.

TPE

Amendments to the TPE PPM trajectory were made to the revised CP5 exit position, to reflect the issues experienced by the May '18 timetable changes. The benefits associated with the optimised timetables have yet to be realised and were forecast to have a 4.5pp PPM increase, with other initiatives resulting in more modest PPM increases.

Initiative	CP5 PPM effect	CP6 PPM effect
CP6 entry	88.6%	82.4%
Optimised timetables	+0.3%	+4.0%
Infrastructure reliability, predict and prevent maintenance	+0.2%	+1.1%
On time all the time performance	+0.2%	+1.0%
Fleet reliability/New fleet	+0.3%	+0.6%
CP6 exit	89.0%	86.2%

Table 6-4: Summary of LNW Revised Assumptions

The Reporter has no further comments to make in relation to the CP6 PPM trajectory modelling.

6.4.4 South East Route

Due to the size of the South East Route model, a meeting was held on 20th September 2018 to review the revised model. Following the RSP submission, South East was asked to change their probability from P80 to P50 and remove unfunded Digital Railway initiatives from the model to align their forecasts with those of other Routes. In addition, a review was undertaken by the Route to align their input assumptions to those of other Routes. This resulted in revisions to a selection of initiatives. A summary of the effected initiatives along with the forecast change in PPM trajectory assumptions for the two lead operators for this Route are provided below.

Initiative	Southeastern	GTR
Thameslink Timetable	-0.1%	-0.3%
Current Performance: Fatalities and trespass (new baseline 31.08.18)	-0.3%	-0.2%
Operations	No impact	No impact
TOC improvements	-0.3%	-0.6%
CP6 Exit at P50	89.0%	83.9%

Table 6-5: Summary of South East Route's PPM Trajectory Assumptions

The Reporter has no further comments to make in relation to the CP6 PPM trajectory modelling.

6.4.5 Wales

No changes were made to the Wales route modelling following the 14th September submission.

The Reporter has no further comments to make in relation to the CP6 PPM trajectory modelling.

6.4.6 Wessex Route

The final submission CP6 performance trajectory model reflected changes made to the input assumptions. These resulted in changes to Years 3, 4 and 5 of the initial CP6 trajectory whilst maintaining their original CP6 SBP exit position. Within the updated assumptions both Crew Management and New Fleet were revised to reflect the current thinking that they would have no impact on PPM at P50, whilst growth in passenger numbers was amended to reflect a lower than originally predicted passenger growth rate. A summary of the revised assumptions and their associated PPM effects for the July and September submitted trajectories is provided in the following table.

Category	13th July Effect	14th September Effect
Start of CP6	86.5%	83.7%
Historical Trend	-2.1%	-
Congestion	-1.5%	-0.9%
IA Reversion	+1.5%	+1.5%
Feltham Re-Signalling	+0.1%	+0.1%
Portsmouth Re-Signalling	+0.1%	+0.1%
New Fleet	+0.2%	+0.5%
Crew Management	+0.4%	+0.6%
Planned & Predictive Maintenance	+1.1%	+1.1%
Reactionary Delay	+1.2%	+1.2%
Stabling	-	+0.6%
Control	-	+0.8%
Industrial Relations	-	+0.3%
External	-	-0.2%
Fleet	-	-0.2%
Network Management / Other	-	-0.5%
Non-Track Assets	-	-0.4%
Operations	-	-0.1%

Severe Weather, Autumn & Structures	-	-0.1%
Stations	-	-0.5%
TOC Other	-	-0.1%
Track	-	-0.3%
Traincrew	-	-0.2%
PPM End of CP6	87.5%	87.5%

Table 6-6: Summary of Wessex Route PPM Trajectory Assumptions

The Reporter has no further comments to make in relation to the CP6 PPM trajectory modelling.

6.4.7 Western Route

Western submitted a paper detailing their modelling approach, along with an overview of changes applied to their modelling assumptions which resulted in an updated CP6 PPM performance trajectory within the final submission. Examples of changed assumptions included "Direct Award provides an opportunity to correct any SLC issues impacting on performance". However, Western did not provide a model consistent with the updated CP6 performance trajectory to allow for a meaningful review of the CP6 trajectory build-up.

Insufficient modelling evidence submitted to support proposed CP6 PPM trajectory.

6.4.8 FNPO Route

No performance model was provided for review by FNPO. A waterfall diagram for CrossCountry was provided however no detail or methodology for the Route's method of assessing the likely impact of changes across CP6 was shared.

Insufficient modelling evidence submitted to support proposed CP6 PPM trajectory.

6.4.9 Scotland

A model was not provided by the Scotland Route for review.

No review of the Scotland Route trajectory has been undertaken.

6.5 Asset Sustainability

The revised submission did not contain any material changes to the Route position with regard to the impact of additional investment in asset sustainability feeding through to performance benefits. Thus, the commentary in the Interim Submission remains the review position.

6.6 PPM Trajectory Confidence

6.6.1 Introduction

This sub-section provides the Reporter's summary assessment of the review of all the information made available up to 14th September 2018. It presents the final view of all the elements described previously in Sections 4, 5 and 6 of this report.

6.6.2 Analysis

The outcomes of the review described in the earlier part of this chapter have been combined into a single view of confidence in the Route forecast. This view, along with a justifying commentary, is provided in the following table.

Route	Commentary	Confidence
Anglia		We have some confidence in the proposed PPM trajectory
LNE& EM		We have low confidence in the proposed PPM trajectory
LNW		We have reasonable confidence in the proposed PPM trajectory
Scotland	This Route was not reviewed	

South East		
Wales		We have some confidence in the proposed PPM trajectory
Wessex	Although Wessex were not stretching, their approach to modelling and analysis was strong. A revision to their trajectory following challenges around the dependency on the TOC for performance improvement was noted. It was considered that the Route taking a more realistic but more pessimistic view was sensible.	We have high confidence in the proposed PPM trajectory
Western	The Reporter had some confidence in the proposed trajectory. This was based on the steep trajectory now proposed for CP6. This assumed GWR can achieve their performance improvement to a shorter timescale. The risks to performance were around continuing poor performance of the new fleet, electrification schemes and unattributed / immeasurable schemes attributed to people development and culture change. Late implementation of initiatives undermined confidence.	We have some confidence in the proposed PPM trajectory

Table 6-7: Reporter View of PPM Trajectory Confidence by Route Based on Input Received up to 14th September 2018

The confidence gradings shown in Table 6-7 (based on the final submission) vary from that produced at the end of August (ahead of the input from the operators, and the submissions of 31st August and 14th September). The variations are summarised in Table 6-8.

Route	Interim Report View Described in Section 4	Final Report View Described in Section 6	Comment
Anglia	Low Confidence	Some Confidence	The key impact altering the confidence rating was the work done by the Route associated with the trajectory model.
LNE&EM	Some Confidence	Low Confidence	Since the original engagement no modelling evidence had been provided. There had also been poor feedback from TOCs regarding Route engagement.
LNW	High Confidence	Reasonable Confidence	Concerns raised by certain TOCs undermined elements of the submission
South East	Reasonable Confidence	Reasonable Confidence	No change
Wales	Some Confidence	Some Confidence	No change
Wessex	High Confidence	High Confidence	No change
Western	Reasonable Confidence	Some Confidence	The Route response to the major changes taking place on raised some concern leading to a drop in confidence regarding the outcome

Table 6-8: Comparison Between Interim and Final Report PPM Confidence by Route

Based on the final analysis an assessment has been made of the Reporter's view of the PPM applicable to each of operator compared to the PPM trajectory forecast by Network Rail. This is illustrated in Figure 6-1.

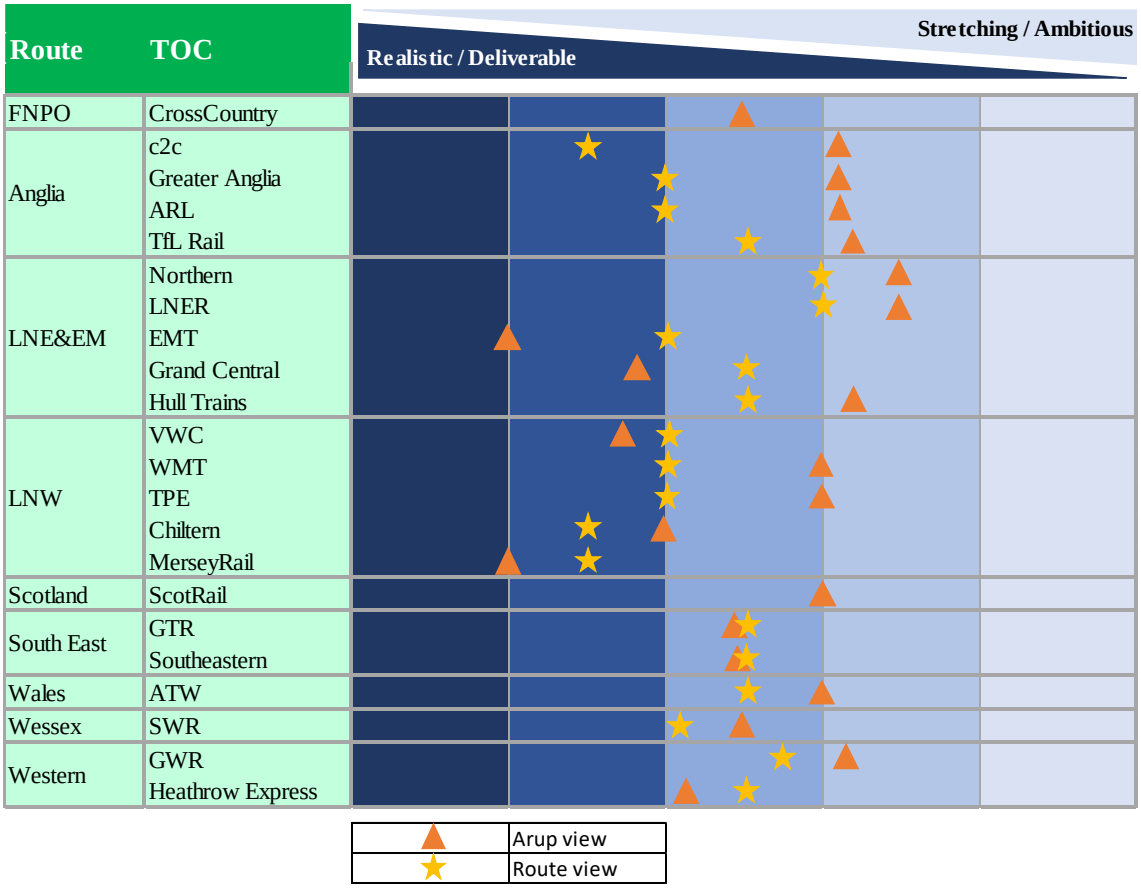

Figure 6-1: Reporter View of Revised PPM Trajectory Delivery for Each Operator

6.7 CRM-P trajectories

The review that has been undertaken of the performance trajectories was focused on the overall delivery of the performance as measured by PPM and as such included impacts and mitigations from both Network Rail and the respective TOCs. It is considered that there is no straightforward means of disentangling the crossover influences between delays that are under the control of either party.

Experience led to the conclusion that Routes were generally more confident in the CRM-P trajectories than those associated with individual TOC PPM outcomes. As a result, the review based its view of CRM-P on those trajectories that emerged for the relevant PPM trajectories. Specifically, the assessment that was undertaken factored in the scale of TOC operation to weight the view of each Route's CRM-P trajectory. The results of the assessment are shown in Figure 6-2.

Figure 6-2: Arup Confidence in CRM-P Trajectories by Route

Reporter view of confidence in the CRM-P trajectories was that LNE&EM was stretching and ambitious. There was also a low level of confidence in process for this Route. Western and Anglia Routes were also considered to be stretching but there was a greater level of confidence in their processes. The remainder of the Routes had a broadly neutral assessment of delivery confidence but with varying degrees of process confidence. There was the greatest level of process confidence with Wessex Route.

7 Conclusions and Recommendations

7.1 Introduction

This Section of the report sets out the overall conclusions from both parts of the review. These are presented in as a series of comments on the process that was observed with regard to the development of the trajectories.

The final part of the Section tabulates a set of Recommendations based on the findings of the review.

7.2 Conclusions

Throughout the review there had been varying evidence of the success and level of engagement between the various Routes and their constituent operators. Some Routes had a highly structured approach whilst the feedback on others was more ad hoc. Throughout the process the Reporter did not see evidence of individual freight operator consultation beyond high level commentary in an FNPO document.

Linked to the issue of engagement, the Reporter was unable to find a consistent method which captured the TOC engagement and input to the CP5 exit and through CP6 performance levels. This made interpretation of results and judgement of impact of engagement difficult to assess.

In the review it emerged that many of the Routes were unaware of either strategic or basic operational schemes / practises. There was also little evidence of collaboration between teams to spread best practice. For example, in strategic terms there was sparse knowledge of the Digital Railway programme or the benefits it could offer either in modules, operator led deployments, or through Network Rail deployed ETCS signalling. In terms of collaboration, this was exemplified by the overall approach to CrossCountry where particular Routes were reluctant to measure their performance. However, it was noted that both Wessex and Western worked together to ensure CrossCountry were measured at Reading despite the boundary being at nearby Southcote Junction.

The modelling approaches between the Routes again varied enormously. This manifested itself in a number of ways; for example, some Routes demonstrated good practice and used detailed regression analysis and Monte Carlo simulation in conjunction with regression analysis. Some relied on conventional spreadsheet analysis supported by professional opinion. Other Routes stated that they did not use models to generate their trajectories. It was accepted that the challenges of forecasting performance were different in each Route, not least because of the number of operators involved. However, the variability in the approaches made it difficult to compare outputs.

7.3 Recommendations

The following recommendations are made in relation to this review.

No.	Recommendation	Benefits	Evidence of Implementation	Owner	Target Date for Completion
L4AR00x 01	Network Rail should ensure there is greater engagement with freight operators in the process to agree performance trajectories since it is recognised that the FOCs impact on TOC operations and vice-versa.	assessment involving potentially high-risk operators	meetings with these operators	FNPO	June 2019
L4AR00x 02	Network Rail Routes should consider process improvements to ensure their key performance teams have access to / knowledge of industry schemes (for example the Digital Railway Programme), operational practice, and strategic schemes to improve the quality of their performance trajectories.	This will deliver improved outputs based on best practice expertise	Documented processes incorporating the change and evidence of application	NR	June 2019
L4AR00x 03	Network Rail should ensure that all Routes (including FNPO) use recognised best practice statistical analytical methodologies in the development of their performance trajectories, supported by the National Performance Team. (Noting that one size does not fit all, it is only the methodologies that should be standardised, not the inputs.)	This will generate a more consistent set of forecasts with verified confidence levels. This is considered important given the enhancement pipeline and the change processes to be adopted in CP6.	Documented processes incorporating the change and evidence of application	NR	June 2019
L4AR00x 04	The Network Rail Routes should consider improvements to their processes to include a number of standard templates for engagement with Operators (both passenger and freight)	This will generate a standardised engagement profile which will allow easier interpretation. It will also generate an auditable trail of correspondence and engagement.	Documented processes incorporating the change and evidence of application	NR	June 2019

Table 7-2: Study Recommendations

Glossary

ARL	Arriva Rail London - a train operator
C2C	a train operator
CP5 / 6	Control Period 5 / 6
CRM-P	Consistent Route Measure - Passenger Performance
E&P	Electrification and Plant
ECML	East Coast Main Line
EMT	East Midland Trains
ESR	Emergency Speed Restriction
ETCS	European Traffic Control System
FDM	Freight Delivery Metric
FNPO	Freight and National Passenger Operator - a Route
FOC	Freight Operating Company
FWI	Fatalities and Weighted Injuries
GA	Greater Anglia - a train operator
GC	Grand Central - an open access operator
GPS	Global Positioning
GTR	Govia Thameslink Railway - a train operator
GWR	Great Western Railway - a train operator
HS2	High Speed 2
HST	High Speed Train
HT	Hull Trains - an open access operator
IEP	Inter-City Express Programme
KATW	Keolis Amey Trains Wales
LNE&EM	London North Eastern / East Midlands Route
LNER	London North Eastern Railway - a train operator
LNW	London North Western Route
MAA	Moving Annual Average
MTRC	MTR Crossrail - a train operator
NoR	Northern - a train operator
NR	Network Rail
NTF	National Task Force
OLE	Overhead Line Equipment
ORR	Office of Rail and Road
P80 / P50	Probability 80% / 50%
PPM	Public Performance Measure
RSP	Route Strategic Plan
SWR	South Western Railway - a train operator
TBC	To be confirmed
TOC	Train Operating Company
TPE	TransPennine Express - a train operator
TSR	Temporary Speed Restriction
VWC	Virgin West Coast - a train operator
WCP	West Coast Partnership
WMT	West Midland Trains - a train operator

Appendix A

Mandate

Mandate for Independent Reporter Lot 4

Title	Assessment of Network Rail's response to performance challenges within the draft determination
Unique Mandate Reference Number	L4AR004c
Date	12/07/2018
ORR Lot Lead	Sneha Patel
ORR lead for this inquiry	Matt Durbin
Network Rail Lot Lead	Jon Haskins
Network Rail lead for this inquiry	

Background

The Periodic Review for CP6 (PR18) is underway and ORR published its draft determination for England and Wales and Scotland on 12 June 2018. In PR18, ORR is focusing on routes and the System Operator (SO), as part of its regulation of Network Rail as a whole. More information can be found on the PR18 pages of ORR's website. The draft determination summarised ORR's analysis of Network Rail's Route Strategic Plans (RSPs) and SO strategic plan published in February 2018.

The scorecards included in the geographic RSPs (for all geographic routes including Scotland) proposed to include the following:

1. a performance trajectory for the route, using the Consistent Route Measure for passenger performance (CRM-P);
2. performance trajectories for all the operators for which the route is lead route; and
3. performance trajectories for freight using the route level Freight Delivery Metric (FDM-R).

In addition, each of the RSPs includes proposed regulatory minimum floors that would indicate where ORR is highly likely to commence a formal investigation if this floor is breached.

The Freight and National Passenger Operator (FNPO) route included performance trajectories for CrossCountry and Caledonian Sleeper along with a national freight performance trajectory using the Freight Delivery Metric (FDM).

Each route (geographic and FNPO) identified key activities, risks and opportunities for achieving its proposed performance trajectories.

Analysis of Route Strategic Plans

Analysis of the RSPs by ORR and the Independent Reporters identified a small number of areas where it required Network Rail routes to make some amendments to its plans (the targeted adjustment).

Specifically, the targeted adjustment required Network Rail to review its CRM-P and PPM performance trajectories for passenger services. In particular:

1. address the CRM-P performance modelling issues for Anglia, South East, and Wessex routes;
2. engage with train operators with the aim of achieving greater agreement of route performance trajectories for CP6
3. consider the specific opportunities and risks for improved industry performance identified by train operators through the National Task Force (NTF) process in April 2018;

4. recalculate the CRM-P regulatory minimum floor using the methodology set out in the draft determination; and
5. reflect consequential changes to performance trajectories arising from any additional renewals spend as a result of ORR's challenge on sustainability[10].

Network Rail will be submitting its response to ORR by 13 July 2018. By this date, NTF will submit its conclusions on route/customer agreement to the update of the performance trajectories and RSPs. Network Rail's submission will include:

1. a report documenting by geographic route passenger performance trajectories that includes the route's response to train operators' suggested opportunities and risks and a clear articulation of whether the trajectories have been agreed with operators or not;
2. a written response from Anglia, South East, and Wessex routes to the issues raised in the draft determination about CRM-P trajectories and an estimate of the impact on CRM-P of any adjustments;
3. a description of the nature of any changes to performance trajectories that lead to other significant changes to the February 2018 RSPs; and
4. a description of whether any of the above changes, or any further customer discussions has changed the freight performance trajectories for FDM and FDM-R.

ORR's Scorecards and Requirements supporting document provides further information on assessment and conclusions for performance as part of the draft determination.

Purpose

The purpose of this work is to provide support to ORR in its assessment of:

- Network Rail's routes' responses to ORR's requirement for targeted adjustments to its RSPs; and
- the routes' analysis of operators' responses to National Task Force (NTF) where additional risks and opportunities for improved performance were identified.

Both these requirements were specified in the draft determination for CP6.

Final outputs from this work will input to ORR's final determination for CP6, due for publication on 31 October 2018.

Scope

Specifically, the reporter will be required to evaluate:

1. **Anglia, Wessex and South East routes (and Wales as appropriate) performance trajectories.** Assess and assure Network Rail's review of the above including:
    - the methodology employed in recalculating performance trajectories
    - the rationale the route has set out for any change
    - any consequential impacts on other routes.

2. **Risks and opportunities identified by operators' (through the NTF).** Review and assure routes' response on:
    - the validity of routes' responses to these identified risks and opportunities

[10] Our draft determination identified a further £1bn investment in asset sustainability and established a performance innovation fund of £10m and Network Rail will need to consider the need to revise any of its performance trajectories based on this incremental investment.

- the robustness of the re-calculations of any performance trajectories that have changed or should change, both for the lead route and any consequential impacts on other routes.

3. **Potential funding for asset sustainability and performance innovation.** Review and assure routes' responses on:
    - the validity of routes' responses to the potential funding
    - the robustness of the re-calculations of any performance trajectories that have changed or should change, both for the lead route and any consequential impacts on other routes

The assessment of Network Rail's targeted adjustment of the RSPs will cover the eight geographic routes and the FNPO route.

Methodology

The below tasks should be undertaken as part of this review:

- engage with ORR planning and analysis of route and NTF submissions;
- attendance at a meeting with Network Rail's National Performance and Analysis Team (NPAT) to review the assurance process of the targeted adjustment of the RSPs and stakeholder engagement;
- attendance at analytical meetings with Anglia, South East, Wessex and FNPO routes; and
- attendance at route meetings to review operator responses to the NTF pro formas

Timescales and deliverables

The work will need to align with the timescales set out below.

In order to provide the input required for the ORR Programme Board on 11 September 2018, it is anticipated the reporter will need to commence work by 13 July 2018. Specifically at this stage, it is anticipated that the following will be required, but this plan may be subject to revision dependent on the content submitted by Network Rail routes on 13 July 2018.

Activity	**Delivery**
Kick off meeting	23 July
Forming and sharing of early thoughts, the evidence base in advance of route meetings and planning for route meetings with the ORR	w/c 23 or 30 July
Sharing of early thoughts, the evidence base post route meetings (and in advance of interim findings) with ORR	23 August
Initial findings and interim report/slides submitted to Network Rail and ORR	**No later than** 31 August
Review and analyse draft determination consultation responses in collaboration with ORR	31 August-6 September
Submission of draft final report to Network Rail and ORR	TBC
Submission of final report to Network Rail and ORR	TBC

Appendices

- Appendix 1 – Joint ORR and Network Rail Guidance to Reporters

Appendix 1 – Joint ORR and Network Rail Guidance to Reporters

1. The purpose of this document is to describe the trilateral relationship between ORR, Network Rail and each Reporter. It sets out in a practical context what both ORR and Network Rail expect from Reporters, and seeks to encourage best practice. This will help Reporters to deliver work in a way which meets these expectations and requirements. These requirements will be taken into account as part of the Reporter Framework (as provided to Reporters).

2. This guidance is owned and updated as necessary jointly by ORR and Network Rail. In the event of any discrepancy between this document and the Reporter contract, the latter will prevail. This guidance does not provide an exhaustive list of responsibilities and should Reporters wish to discuss these guidelines further they should contact the following for a trilateral discussion:

    - Andy Lewis for ORR; and
    - Jonathan Haskins for NR.

The trilateral relationship

3. Licence Condition 13 (LC13) of Network Rail network licence states:

    - "The role of the Reporter is to provide ORR with independent, professional opinions and advice relating to Network Rail's provision or contemplated provision of railway services, with a view to ORR relying on those opinions or advice in the discharge by ORR of its functions under, or in consequence of, the Act. Where appropriate, ORR shall give the licence holder an opportunity to make representations on those opinions or advice before relying on them."

4. Reporters should be familiar with the obligations as set out in LC13 and the terms of the contract.

5. For the avoidance of doubt, in delivering this role, ORR and Network Rail expect that Reporters will also add value to Network Rail in helping it to improve its performance and business as provider of railway services, wherever possible. However, it is recognised that this is not the primary purpose of the Reporter under the Licence and that this may not always be possible to deliver each mandate.

Role & duties of the reporters

6. Reporters must provide an independent view and remain impartial throughout the review.

    For example:

    - information should be shared equally and at the same time with both clients. Any correspondence or clarifications sought by Reporters should also be dealt with in the same way; and
    - communication between all three parties should be open e.g. both ORR and Network Rail should be invited to or made aware of meetings or discussions even if the meeting is more appropriate with only one client.

Identifying Reporter work

7. ORR will identify instances where there is a requirement to engage a Reporter. In practical terms, this is likely to arise from on-going discussions with Network Rail and in most cases (except urgent or exceptional cases) the potential for engagement of Reporters will have been identified in advance.

Mandates – Reporter Proposals

8. Clause 4 of the contract sets out the key requirements around provision of services. Requirements for reporter work normally arise from the day to day discussion of issues between ORR and Network Rail.

9. ORR will prepare a draft mandate for each piece of work and will in most cases agree this with Network Rail.

10. Mandates will be presented in a standard format for consistency and will clearly set out:

    - the purpose;
    - the scope;
    - why the review is necessary;
    - what it will achieve;
    - the expected outputs; and
    - timescales for providing reports.

11. Once agreed with Network Rail, ORR will email the mandate to the relevant Reporter(s), asking for comments and a proposal for the work, which should include costs and CVs for the proposed Reporter team. The Reporter has seven working days to respond with a proposal or such other timescale as determined by ORR. Every proposal must include:

    - costs;
    - resources;
    - CVs of the proposed mandate team – when providing proposals, Reporters should make the most efficient use of their resources including the most appropriate make-up of the review team;
    - methodology for delivering the aims of the mandate;
    - timescales;
    - framework of meetings, including a tripartite findings meeting before issue of the draft report;

- expected deliverables and a concise explanation of how the aims of the mandate will be met; and
- for larger scale reporter studies, the project management approach and project plans should be made explicit

12. Where there are multiple Reporters on a Lot, the ORR and Network Rail will use the following criteria to determine which Reporter they will select to conduct the work:

Procedure for Call Off under the Framework Agreements

Where more than one Contractor has been selected for any particular lot, ORR and Network Rail will allocate mandates on the basis of the following criteria:
The expertise required is only available from one source. This may be due to ownership of exclusive design rights or patents.
Where the mandate constitutes follow up work, which is directly related to a recently completed study.
The Contractor which demonstrates the greatest expertise in the subject matter of the mandate or the approach required.
The Contractor's performance against the performance framework
An overall assessment of value for money based on cost and complexity of work.
If the ORR and Network Rail cannot determine the most appropriate Contractor for a mandate using the above criteria, ORR and Network Rail will conduct a mini-tender with the Contractors who have been awarded the relevant lot using the following criteria in order to determine the most economically advantageous proposal:

1. The Contractor demonstrates sufficient knowledge of subject matter and possesses the technical skills, resource and competencies required for the work.
2. Contractor Costs.
3. The Contractor demonstrates innovation and value for money in its proposal.
4. The Contractor's performance against the performance framework.

13. Prior to conducting such a mini-tender, ORR and Network Rail will inform Contractors of the relative weighting of the above criteria and of any additional sub-criteria applicable in the context of a particular mandate.

14. ORR and Network Rail will endeavour to discuss the proposals received and to confirm by e-mail within **five working days** that the proposal is acceptable (or otherwise). There may be circumstances where ORR and Network Rail need longer to respond.

15. ORR will then formally instruct the reporter to start work, and the reporter will arrange a start-up meeting with key representatives from both ORR and Network Rail.

Mandates – During Delivery

16. The following sets out some key points regarding conduct of any inquiry. Reporters must provide an independent view and remain impartial throughout the inquiry. They should expect to discuss their progress and findings trilaterally with ORR and Network Rail and for some challenge to be given – particularly in relation to the factual accuracy of the findings.

Costs and expenses

17. If additional funds are required to deliver a mandate beyond those agreed at the outset, a timely proposal and justification must be given to ORR and Network Rail (as soon as the issue arises). The Reporter should notify ORR and Network Rail who will discuss and respond in a reasonable timescale. Additional work (and cost) must not proceed without approval.

18. Any reasonably incurred expenses will be reimbursed by Network Rail. Only expenses that have been incurred in accordance with Network Rail's expenses policy will be paid. It should be specifically noted that reporters must use standard class travel and plan journeys in advance as much as possible. In addition no claims for lunch will be processed even if submitted. In the event that a Reporter is working on a 'call out' during the night which takes them into the morning, the Reporter will be eligible to claim up to £7.50 for breakfast. No other scenario qualifies for claiming breakfast. Hotel accommodation costs will only be paid up to the maximum rate limit (per person per night, including VAT) as set out in Network Rail's expenses policy.

19. All invoices should be sent to Matthew Blackwell (matthew.blackwell@networkrail.co.uk) at Network Rail prior to being sent to Network Rail Accounts Payable.

Amendment to mandates

20. For practical reasons it may be necessary for a mandate to be revised once work has commenced or awarded. For the avoidance of doubt this will not lead to the ORR and Network Rail seeking to re-run the award of the mandate unless ORR and Network Rail agree that the revision constitutes a material change to the original mandate.

Meetings

21. Unless otherwise directed, all key meetings must be trilateral and both parties should be made aware of any other meetings taking place.

22. The Reporter should take minutes of meetings, which should be provided to all parties within 7 working days.

Issues or concerns

23. Should a situation arise whereby either ORR or Network Rail is dissatisfied with the quality of a piece of work, we will explain clearly our reasons, gain approval from the other client and then, if we deem appropriate, may request the Reporter to re-do that part of work at no additional cost.

24. Should the Reporter encounter any issues with an inquiry (review) the Reporter should notify:

    - Andy Lewis for ORR
    - Jonathan Haskins for NR

Reports

The report document

25. All Reports must include an 'Executive Summary' which should be written clearly, concisely and highlight key findings and key recommendations.

26. The full reports should also be written concisely in plain English, and should provide a brief 'Introduction' outlining the aims of the mandate and how these have been met. They should provide further detail on what is mentioned in the Executive Summary and there should not be any material points raised in the main report which have not already been mentioned in the Executive Summary.

27. Where there is commercially sensitive information in the report, the Executive Summary will be published on ORR's website, with any necessary redactions, instead of the full report. Otherwise, usually the full report will be published unless any redactions are appropriate due to a Freedom of Information Act exemption.

Recommendations

28. A recommendation is a specific action that the Reporter considers, following its analysis, should be undertaken by either Network Rail, or any other party. While the majority of recommendations are likely to be for Network Rail, not all need to be.

29. Reporters should make all recommendations SMART (Specific, Measureable, Achievable, Realistic and Timebound). The Reporter should:

    - provide a clear description of the recommendation and the benefit that implementation will deliver;
    - outline the evidence which is required in order for the recommendation to be closed out; and
    - discuss and agree a target date for completion of the recommendation with ORR and Network Rail.

30. Recommendations should only be included in the report if they actually add value to either ORR or Network Rail or another industry party and the benefits are sufficient to justify implementation. It is acceptable for a report not to include recommendations, as long as key requirements of the mandate have been met (e.g. if an inquiry finds that Network Rail is fully compliant with its requirements). A smaller number of well-targeted and SMART recommendations which will deliver tangible improvements is preferable to a large number of general recommendations.

31. In order to add further value, the report may also include observations on areas for improvement which do not need to be captured in a formal Recommendation if they are not central to delivery of the mandate requirements.

32. Recommendations will be tracked by the Reporter which generated them.

Payment

33. Reporters must include the purchase order number, and unique mandate reference (UMR) number for work when invoicing Network Rail for payment.

34. The clients can query invoices and have the right to check timesheets (and expenses) and investigate work before payment is agreed.

Post-mandate review

35. The clients will provide feedback on the work carried out, having assessed performance using the Performance Framework on a per mandate basis. This will reflect any issues or concerns raised with the Reporter during delivery of the mandate.

The clients will also hold formal feedback sessions with each Reporter every six months to review progress.

Appendix B

Documents Received

RECEIVED BY EMAIL			
Received	From	File/Title	Type
31/07/2018	ORR	CP6 Forecasting ARL modelling.xlsx	Microsoft Excel Worksheet
31/07/2018	ORR	CP6 Forecasting GA modelling.xlsx	Microsoft Excel Worksheet
31/07/2018	ORR	GA CP6 performance planning draft 040618 v2.pptx	Microsoft PowerPoint Presentation
31/07/2018	ORR	Anglia Route CP6 performance planning programme 190618 review and outputs 130718.docx	Microsoft Word Document
31/07/2018	ORR	Performance plan for CP6 requirements for Anglia Route v2 280618 including summary references.docx	Microsoft Word Document
01/08/2018	NR - Anglia	CP6 Forecasting ARL modelling.xlsx	Microsoft Excel Worksheet
01/08/2018	NR - Anglia	CP6 Forecasting GA modelling.xlsx	Microsoft Excel Worksheet
01/08/2018	NR - Anglia	GA CP6 performance planning draft 040618 v2.pptx	Microsoft PowerPoint Presentation
01/08/2018	NR - Anglia	Anglia Route CP6 performance planning programme 190618 review and outputs 130718.docx	Microsoft Word Document
01/08/2018	NR - Anglia	Performance plan for CP6 requirements for Anglia Route v2 280618 including summary references.docx	Microsoft Word Document
01/08/2018	NR - Anglia	FW Arup review of Draft Determination response.msg	Outlook Item
01/08/2018	ORR	FNPO.zip	zip Archive
01/08/2018	ORR	180213 Slides for second ORR Review Meeting v2.pptx	Microsoft PowerPoint Presentation
01/08/2018	ORR	CrossCountry CP6 Performance Trajectory.pptx	Microsoft PowerPoint Presentation
01/08/2018	ORR	Meeting Note - FNPO - 2018 01 15 - Performance Trajectories Meeting 1 - ID 79.docx	Microsoft Word Document
01/08/2018	ORR	Meeting Note - FNPO - 2018 02 21 - Performance Trajectories Meeting 2 - ID 88.docx	Microsoft Word Document
01/08/2018	ORR	Agenda - FNPO - 2018 01 15 - Performance Trajectories Meeting 1 - ID 79.docx	Microsoft Word Document
01/08/2018	ORR	R-FDM calculation changes 20180216.pptx	Microsoft PowerPoint Presentation
01/08/2018	ORR	FDM-R_Meeting_Notes_21052018.docx	Microsoft Word Document
01/08/2018	ORR	TLG SP email re Wessex FDM-R target.msg	Outlook Item
01/08/2018	ORR	Agenda - FNPO - 2018 02 21 - Performance Trajectories Meeting 2 - ID 88.docx	Microsoft Word Document
08/08/2018	ORR	CRM-P.PPTX	Microsoft PowerPoint Presentation
08/08/2018	ORR	ORR R-FDM target meeting August 2018 01082018.pptx	Microsoft PowerPoint Presentation
09/08/2018	ORR	20180807_Notes from FNPO analytical meeting_draft.docx	Microsoft Word Document
13/08/2018	ORR	X Country Measure.msg	Outlook Item
13/08/2018	ORR	RE LNE Scorecard Metrics.msg	Outlook Item
13/08/2018	ORR	RE CrossCountry on Anglia scorecards.msg	Outlook Item
13/08/2018	ORR	LNEEM CP6 Performance_ORR 14 August_DRAFT_v5.pdf	Adobe Acrobat Document
14/08/2018	ORR	FINAL - CP6 ORR Draft Determination - Train Performance Review.pdf	Adobe Acrobat Document
14/08/2018	ORR	20180814_Notes from Wessex route analytical meeting_draft.docx	Microsoft Word Document
15/08/2018	NR - LNW	ORR perf review answers - FINAL 14.08.18.xlsx	Microsoft Excel Worksheet
15/08/2018	NR - LNW	CP6 PPM Forecasting Model - 15.08.18.xlsx	Microsoft Excel Worksheet
15/08/2018	NR - LNW	ORR – LNW CP6 SBP.pptx	Microsoft PowerPoint Presentation
15/08/2018	NR - LNW	TPE CP6 Joint Perfomance Strategy DRAFT 12th July 18.pdf	Adobe Acrobat Document
15-Aug-18	NR - LNW	Merseyrail CP6 Joint Perfomance Strategy DRAFT 12th July 18.pdf	Adobe Acrobat Document
15-Aug-18	NR - LNW	Chiltern CP6 Joint Perfomance Strategy DRAFT v1 12th July 18.pdf	Adobe Acrobat Document
15-Aug-18	ORR	WMT CP6 Joint Perfomance Strategy DRAFT v1 12th July 18.pdf	Adobe Acrobat Document
15-Aug-18	ORR	Virgin Trains CP6 Joint Perfomance Strategy DRAFT 12th July 18.pdf	Adobe Acrobat Document
17-Aug-18	ORR	2018 Aug 10 - Anglia review meeting.docx	Microsoft Word Document
20-Aug-18	ORR	ORR perf review answers - FINAL 14.08.18.xlsx	Microsoft Excel Worksheet
20-Aug-18	ORR	CP6 PPM Forecasting Model - 15.08.18.xlsx	Microsoft Excel Worksheet
22-Aug-18	NR - FNPO	CP6 notes.docx	Microsoft Word Document
22-Aug-18	ORR	20180813_Notes from Sout East route analytical meeting_draft.docx	Microsoft Word Document
22-Aug-18	ORR	2018 Aug 16 - Wales review meeting draft.docx	Microsoft Word Document
22-Aug-18	ORR	2018 Aug 10 - Anglia review meeting draft.docx	Microsoft Word Document
22-Aug-18	ORR	2018 Aug 15 - Western review meeting draft.docx	Microsoft Word Document
23-Aug-18	ORR	20180814_LNE_EM meeting notes and actions_draft.docx	Microsoft Word Document
24-Aug-18	ORR	CP6 PPM Forecasting Model - 15.08.18.xlsx	Microsoft Excel Worksheet
24-Aug-18	ORR	Wales Route CP6 Performance trajectory.xlsx	Microsoft Excel Worksheet
27-Aug-18	ORR	20180808_NPAT meeting notes & actions_draft.docx	Microsoft Word Document
27-Aug-18	TOC - Southeastern	Post Route Review Questions to Operators (002).docx	Microsoft Word Document
29-Aug-18	TOC - Chiltern	Post Route Review Questions to Operators CRCL.docx	Microsoft Word Document
29-Aug-18	TOC - Chiltern	Chiltern CP6 Joint Perfomance Strategy DRAFT v1.docx	Microsoft Word Document
29-Aug-18	TOC - Chiltern	Control 1819 PPRP Tracker.xlsx	Microsoft Excel Worksheet
29-Aug-18	TOC - Chiltern	Customer Services 1819 PPRP Tracker.xlsx	Microsoft Excel Worksheet
29-Aug-18	TOC - Chiltern	Drivers 1819 PPRP Tracker.xlsx	Microsoft Excel Worksheet
29-Aug-18	TOC - Chiltern	Fleet 1819 PPRP Tracker.xlsx	Microsoft Excel Worksheet
29-Aug-18	TOC - Chiltern	LUL 1819 PPRP Tracker.xlsx	Microsoft Excel Worksheet
29-Aug-18	TOC - Chiltern	Performance 1819 PPRP Tracker.xlsx	Microsoft Excel Worksheet
29-Aug-18	TOC - Chiltern	Resources 1819 PPRP Tracker.xlsx	Microsoft Excel Worksheet
29-Aug-18	TOC - Chiltern	Tracker overview 1819.xlsx	Microsoft Excel Worksheet
29-Aug-18	TOC - Chiltern	Train Planning 1819 PPRP Tracker.xlsx	Microsoft Excel Worksheet
29-Aug-18	TOC - Chiltern	Post Route Review Questions to Operators CRCL.docx	Microsoft Word Document
29-Aug-18	TOC - LNER	Post Route Review Questions to Operators.docx	Microsoft Word Document
30-Aug-18	TOC - KeolisAmey	Post Route Review Questions to Operators KA.docx	Microsoft Word Document
30-Aug-18	ORR	20180823_August route meetings_Initial findings.xlsx	Microsoft Excel Worksheet
30-Aug-18	ORR	1. WMRE Response to PR18 Draft Determination.docx	Microsoft Word Document
30-Aug-18	ORR	2 CILT response - enhancement role and licence changes.docx	Microsoft Word Document
30-Aug-18	ORR	2 Kent County Council response.v2.SG-KS.21.08.18.docx	Microsoft Word Document
30-Aug-18	ORR	2. Midland Connect response to draft determination consultation.docx	Microsoft Word Document
30-Aug-18	ORR	2. WYCA ORR Draft determination response - Aug 2018.docx	Microsoft Word Document
30-Aug-18	ORR	3 Adam Brookes pr18-draft-determination- response.docx	Microsoft Word Document
30-Aug-18	ORR	3 Jonathan Tyler response to draft determination (proforma).odt	OpenDocument Text
30-Aug-18	ORR	3 Roy Freeland (Perpetuum Ltd) response to PR18 draft determination cons....docx	Microsoft Word Document
30-Aug-18	ORR	3 Simon Babes (Movement Strategies) response to PR18 draft determination....docx	Microsoft Word Document
30-Aug-18	ORR	FoFNL Response to ORR Draft Determination.docx	Microsoft Word Document
30-Aug-18	ORR	Initial draft RDG responses to the draft determination licence consultation and enhancements documents.msg	Outlook Item
30-Aug-18	ORR	1 Angel Trains Ltd comments pr18-draft-determination.docx	Microsoft Word Document
30-Aug-18	ORR	1 MTR Crossrail pr18-draft-determination-proforma.docx	Microsoft Word Document
30-Aug-18	ORR	1. Arriva Response ORR Draft Determination Final.docx	Microsoft Word Document
30-Aug-18	ORR	1. DfT Draft Determination Response Final.docx	Microsoft Word Document
30-Aug-18	ORR	1. Nexus response to the ORR PR18 draft determination.doc.docx	Microsoft Word Document
30-Aug-18	ORR	1. RFG response to ORR charges consultation for PR18 draft determination....docx	Microsoft Word Document
30-Aug-18	ORR	1. RIA response to Draft Determination - CP6 Final.docx	Microsoft Word Document
30-Aug-18	ORR	1 Wales Route response to ORR's PR18 DD [version as at 160818] (1).pdf	Adobe Acrobat Document
30-Aug-18	ORR	20180830_DD responses review process- performance trajectories.pptx	Microsoft PowerPoint Presentation
30-Aug-18	ORR	2. Draft Determination Response Final.docx	Microsoft Word Document
30-Aug-18	ORR	Performance Trajectory Evidence Letter Northern Final.pdf	Adobe Acrobat Document

RECEIVED BY EMAIL		
Received	From	File/Title
30-Aug-18	ORR	Performance Trajectory Evidence Letter Northern Final.pdf
30-Aug-18	ORR	PR18 Performance Trajectory - Evidence.zip
30-Aug-18	ORR	Appendix 1 - NorthernCP5CP6_Revsd_v1.1.xlsm
30-Aug-18	ORR	Appendix 2 - CP6 Performance trajectory - status for NTF _Northern (004).docx
30-Aug-18	ORR	Appendix 3 - Northern CP6 Engagement (002).pdf
30-Aug-18	ORR	Appendix 4 - FW CP6 Performance Trajectory.msg
30-Aug-18	ORR	Appendix 5 - New Northern CP6 Waterfall v2.xlsx
30-Aug-18	ORR	Appendix 6 - assessment-of-the-train-performance-trajectories-in-network-rail-route-strategic-plans-for-pr18.pdf
30-Aug-18	ORR	Appendix 7 - ORR PR18 SBP Letter _FEB 18 FINAL.pdf
30-Aug-18	ORR	Appendix 8 - PR18 Draft Determination - Northern Response 160818.pdf
31-Aug-18	ORR	Meeting Note - LNW - 2018 02 08 - Performance Trajectories Meeting 1 - ID 81.docx
31-Aug-18	ORR	ORR LNW CP6 SBP.pptx
31-Aug-18	ORR	20180830_DD responses review process- performance trajectories.pptx
31-Aug-18	ORR	Responses log - performance trajectories.xlsx
31-Aug-18	ORR	Trajectories risks and opportunities (blue).XLSX
31-Aug-18	ORR	Operator agreement on performance trajectories (yellow) v2.XLSX
31-Aug-18	NR - Western	CP6 PPM CRMP Reforecast 310818 Details.xlsx
31-Aug-18	NR - Wessex	CP6 Opportunities Description 170818.xlsx
31/08/2018	NR - Wessex	CP6 PPM CRMP Reforecast 310818 Details.xlsx
31/08/2018	NR - Wessex	Wessex CP6 ReForecast 31 August 2018 for ORR.pptx
31/08/2018	NR - Wessex	Fwd X Country Measure.msg
01/09/2018	ORR	Network Rail's main response to ORR's PR18 Draft Determination, 31 August 2018.pdf
01/09/2018	ORR	Scotland DD response.pdf
01/09/2018	ORR	South East DD response.pdf
01/09/2018	ORR	System Operator DD response.pdf
01/09/2018	ORR	Wales DD response.pdf
01/09/2018	ORR	Wessex DD response.pdf
01/09/2018	ORR	Western DD response.pdf
01/09/2018	ORR	Andrew Haines letter to Joanna Whittington - Response to Draft Determination.pdf
01/09/2018	ORR	Anglia DD response.pdf
01/09/2018	ORR	Changes to Route performance trajectories DD response.xlsx
01/09/2018	ORR	CP6 Operational Performance Trajectories - DD Covering Note.pdf
01/09/2018	ORR	CRM-P tables (August 31st).xlsx
01/09/2018	ORR	FNPO DD response.pdf
01/09/2018	ORR	LNEEM DD response.pdf
01/09/2018	ORR	LNW DD response.pdf
01/09/2018	ORR	Scotland HLOS Tracker for DD response.xlsx
01/09/2018	ORR	Changes to Route performance trajectories DD response2709.xlsx
03/09/2018	ORR	PR18 draft determination consultation responses consolidated pack (reduced file size).pdf
03/09/2018	TOC - XC	Post Route Review Questions to Operators - XC.docx
03/09/2018	ORR	20180830_DD responses review process- performance trajectories.pptx
03/09/2018	TOC - WMT	Post Route Review Questions to Operators DGGB.docx
05/09/2018	ORR	Action log_August 2018.xlsx
05/09/2018	TOC - LNER	Post Route Review Questions to Operators.docx
05/09/2018	ORR	ORR LNW CP6 SBP.pptx
05/09/2018	NR - LNW	LNW CP6 Performance Plan TPE Amended post May 18.xlsx
05/09/2018	ORR	FINAL - South East Train Route - Performance Response to the Draft Determination.pdf
05/09/2018	ORR	Wessex CP6 ReForecast 31 August 2018 for ORR.pptx
05/09/2018	ORR	Fwd X Country Measure.msg
05/09/2018	ORR	FW Wessex Revised Forecast Model.msg
06/09/2018	ORR	2018 09 06 Scorecards top 3 issues for PB.pptx
06/09/2018	ORR	PPM and CRM-P trajectories and Schedule 8.msg
06/09/2018	ORR	RE Notes and actions from NPAT route meeting_08082018.msg
06/09/2018	ORR	Process for converting PPM to CRM-P.docx
07/09/2018	NR - Central	Book1.xlsx
07/09/2018	NR - LNW	LNW CP6 Performance Plan MerseyRail.xlsx
07/09/2018	NR - LNW	LNW CP6 Performance Plan Chiltern.xlsx
07/09/2018	NR - LNW	LNW CP6 Performance Plan Virgin Workbook.xlsx
07/09/2018	NR - LNW	LNW CP6 Performance Plan WMT.xlsx
10/09/2018	NR - Central	Approach to calculating a CP6 trajectory for CRM-P.pptx
10/09/2018	ORR	Approach to calculating a CP6 trajectory for CRM-P.pptx
11/09/2018	ORR	CP6 PPM Forecasting Model - 13.08.18.xlsx
11/09/2018	ORR	Base PPM comparison.xlsx
11/09/2018	ORR	ARL One Plan - Anglia 21.08.18.xlsm
11/09/2018	ORR	20180126 LNEEM CP6 RSP ORR Presentation_performance - FINAL_updated.pptx
11/09/2018	NR - LNEEM	New Northern CP6 Waterfall v2.pdf
11/09/2018	NR - LNEEM	Waterfall_Northern_CP6 v1.xlsx
11/09/2018	NR - LNEEM	Copy of Waterfall_Northern_CP6 v1.xlsx
11/09/2018	NR - LNEEM	Appendix 1 - NorthernCP5CP6_Revsd_v1.1.xlsm
11/09/2018	ORR	Alliance Board - Change to CP6 Trajectory - Agreed.docx
12/09/2018	ORR	Assessment of operator evidence.xlsx
12/09/2018	NR - LNEEM	20180126 LNEEM CP6 RSP ORR Presentation_performance - FINAL_Waterfalls.pptx
12/09/2018	NR - LNEEM	Thameslink Phasing Split v01.1.7.xlsx
13/09/2018	ORR	CP6 notes.docx
13/09/2018	ORR	Copy of PS Waterfall Charts2.xlsx
13/09/2018	NR - South East	TW amendments - 20180813_Notes from Sout East route analytical meeting_d....docx
13/09/2018	NR - South East	ORR CP6 Performance Reviews v01.pdf
13/09/2018	NR - South East	FINAL - South East Train Route - Performance Response to the Draft Deter....pdf
13/09/2018	NR - South East	assessment-of-the-train-performance-trajectories-in-network-rail-route-s....pdf
13/09/2018	NR - South East	Assessment of Network Rail's Response to Performance Challenges v2.pdf
14/09/2018	NR - Anglia	CP6 PPM Forecasting Model - 13.08.18.xlsx
14/09/2018	NR - Anglia	Base PPM comparison.xlsx
14/09/2018	NR - Anglia	ARL One Plan - Anglia 21.08.18.xlsm
14/09/2018	ORR	TW amendments - 20180813_Notes from Sout East route analytical meeting_d....docx
14/09/2018	ORR	ORR CP6 Performance Reviews v01.pdf
14/09/2018	ORR	FINAL - South East Train Route - Performance Response to the Draft Deter....pdf
14/09/2018	ORR	assessment-of-the-train-performance-trajectories-in-network-rail-route-s....pdf
14/09/2018	ORR	Assessment of Network Rail's Response to Performance Challenges v2.pdf
14/09/2018	ORR	Train Numbers - GWR.xlsx
14/09/2018	ORR	Benefit years and Service group affected.xlsx
14/09/2018	ORR	Service Group regression.xlsx

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13/07/2018	NR - Sharepoint	Draft CRM-P trajectories based on latest Route Plans.pdf
13/07/2018	NR - Sharepoint	July DD Response - National Performance - Meeting 8th August.pdf
13/07/2018	NR - Sharepoint	13 July 2018 Letter from Mark Carne to Joanna Whittington - Initial Response to Draft Determination.pdf
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13/07/2018	NR - Sharepoint	Anglia - Arriva Rail London Strategic Performance Narrative.pdf
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13/07/2018	NR - Sharepoint	Anglia - Greater Anglia Strategic Performance Narrative.pdf
13/07/2018	NR - Sharepoint	Anglia - MTR Crossrail Strategic Performance Narrative.pdf
13/07/2018	NR - Sharepoint	Anglia - Responses to specific ORR questions.pdf
13/07/2018	NR - Sharepoint	Anglia - Route Performance Planning Update.pdf
13/07/2018	NR - Sharepoint	Anglia - SBP Performance Evidence Pack Sign Off.pdf
13/07/2018	NR - Sharepoint	Anglia - TfL Rail - NTF Pro Forma.pdf
13/07/2018	NR - Sharepoint	Anglia - TOC Sign Off Log.xlsx
13/07/2018	NR - Sharepoint	FNPO - Caledonian Sleeper - NTF Pro Forma.pdf
13/07/2018	NR - Sharepoint	FNPO - Consideration of further changes to SBP performance trajectories - CrossCountry.pdf
13/07/2018	NR - Sharepoint	FNPO - CrossCountry - NTF Pro Forma.pdf
13/07/2018	NR - Sharepoint	LNEEM - CP6 RSP Performance Presentation.pdf
13/07/2018	NR - Sharepoint	LNEEM - East Midlands Trains - NTF Pro Forma.pdf
13/07/2018	NR - Sharepoint	LNEEM - Grand Central - NTF Pro Forma.pdf
13/07/2018	NR - Sharepoint	LNEEM - Hull Trains - NTF Pro Forma.pdf
13/07/2018	NR - Sharepoint	LNEEM - Northern - NTF Pro Forma.pdf
13/07/2018	NR - Sharepoint	LNEEM - Performance Template.pdf
13/07/2018	NR - Sharepoint	LNEEM - Virgin Trains East Coast - NTF Pro Forma.pdf
13/07/2018	NR - Sharepoint	LNW - Chiltern CP6 Joint Performance Strategy.pdf
13/07/2018	NR - Sharepoint	LNW - Chiltern Railways - NTF Pro Forma.pdf
13/07/2018	NR - Sharepoint	LNW - Merseyrail - NTF Pro Forma.pdf
13/07/2018	NR - Sharepoint	LNW - Merseyrail CP6 Joint Performance Strategy.pdf
13/07/2018	NR - Sharepoint	LNW - SBP Performance Evidence Pack Sign Off - Chiltern.pdf
13/07/2018	NR - Sharepoint	LNW - SBP Performance Evidence Pack Sign Off - Merseyrail.pdf
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13/07/2018	NR - Sharepoint	LNW - West Midlands Trains - NTF Pro Forma.pdf
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13/07/2018	NR - Sharepoint	South East - Performance Response to the Draft Determination.pdf
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13/07/2018	NR - Sharepoint	Wales - Route Strategic Plan.pdf
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13/07/2018	NR - Sharepoint	Appendix G PPM Historic Trend for CP6 Forecasts.pdf
13/07/2018	NR - Sharepoint	SBP Performance evidence pack signoff sheet 120718.pdf
13/07/2018	NR - Sharepoint	Wessex - Performance Evidence Pack.pdf
13/07/2018	NR - Sharepoint	Wessex - PPM Historic Trend for CP6 Forecasts.pdf
13/07/2018	NR - Sharepoint	Wessex - South Western Railway - NTF Pro Forma.pdf
13/07/2018	NR - Sharepoint	Western - CP6 Assumptions.xlsx
13/07/2018	NR - Sharepoint	Western - CP6 Revised Trajectory based on Assumptions.xlsx
13/07/2018	NR - Sharepoint	Western - Great Western Railway - NTF Pro Forma.pdf
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13/07/2018	NR - Sharepoint	Western - SBP Performance Template.pdf
13/07/2018	NR - Sharepoint	Asset Sustainability - Summary.pdf
13/07/2018	NR - Sharepoint	Wessex - Asset Sustainability.pdf
13/07/2018	NR - Sharepoint	Wessex - Summary CP6 Additional Works.xlsx
13/07/2018	NR - Sharepoint	Wales - Summary CP6 Additional Works.xlsx
13/07/2018	NR - Sharepoint	Wales - Asset Sustainability.pdf
13/07/2018	NR - Sharepoint	South East - Summary CP6 Additional Works.xlsx
13/07/2018	NR - Sharepoint	South East - Asset Sustainability.pdf
13/07/2018	NR - Sharepoint	LNW - Summary CP6 Additional Works.xlsx
13/07/2018	NR - Sharepoint	LNW - Asset Sustainability.pdf
13/07/2018	NR - Sharepoint	LNEEM - Summary CP6 Additional Works.xlsx
13/07/2018	NR - Sharepoint	LNEEM - Asset Sustainability.pdf
13/07/2018	NR - Sharepoint	Anglia - Summary CP6 Additional Works.xlsx
13/07/2018	NR - Sharepoint	Anglia - Asset Sustainability.pdf
13/07/2018	NR - Sharepoint	Western - Summary CP6 Additional Works.xlsx
13/07/2018	NR - Sharepoint	Western - Asset Sustainability.pdf

Appendix C

Meetings with Network Rail

As part of the engagement with Network Rail to further understand their submissions a series of meetings were convened. These were organised by the ORR and attended by representatives of Network Rail, ORR and the Reporter team.

The following table summarises the engagement that took place with Network Rail during the course of the commission.

Date	Route	Purpose	Meeting Type
07/08/18	Freight & National Passenger Operator	• Review of FDM-R trajectories • Review of operator response to NTF pro-forma	Face-to-Face
08/08/18	National Performance and Analysis Team	• Review CRM-P floor methodology calculation and outputs • Network Rail's assurance process and overview of stakeholder engagement	Face-to-Face
10/08/18	Anglia Route	• Analytical meeting to discuss performance modelling / trajectories • Review of operator response to NTF pro-forma	Face-to-Face
13/08/18	South East Route	• Analytical meeting to discuss performance modelling / trajectories • Review of operator response to NTF pro-forma	Face-to-Face
14/08/18	Wessex Route	• Analytical meeting to discuss performance modelling / trajectories • Review of operator response to NTF pro-forma	Face-to-Face
14/08/18	London North Eastern / East Midland Route	• Analytical meeting to discuss performance modelling / trajectories • Review of operator response to NTF pro-forma	Face-to-Face
15/08/18	Western Route	• Analytical meeting to discuss performance modelling / trajectories • Review of operator response to NTF pro-forma	Face-to-Face
15/08/18	London North Western Route	• Analytical meeting to discuss performance modelling / trajectories • Review of operator response to NTF pro-forma	Telephone Conference
16/08/18	Wales Route	• Analytical meeting to discuss performance modelling / trajectories • Review of operator response to NTF pro-forma	Face-to-Face
20/09/18	South East Route	• Analytical meeting to discuss performance modelling / trajectories • Review of operator response to NTF pro-forma	Face-to-Face

Appendix D

TOC Engagement Responses

D1.1 TOC Engagement

The early focus of the commission was to undertake a review of the Network Rail submission of 13th July and hold the series of meetings (see Appendix C) to probe the assumptions and resulting trajectories that had been developed by the Routes. As part of that dialogue these meetings sought to understand the engagement and level of agreement that had been reached between the Routes and operators during the process. As part of the process to allow the Reporter to develop a view on the trajectories it was planned that there should be engagement with the operators. The aim of this was to validate the view expressed by Network Rail with regard to the operator input to the forecasts and to understand their position where it had not been possible for the operator to sign-off the CP6 trajectories.

To meet the challenging timescales for the delivery of the Mandate it was agreed with ORR that the engagement with the TOCs would take place by means of a questionnaire designed by the Reporter to tease out key issues associated with the process and its outcome.

The questions were as noted in Figure 4-1 in the main report text.

Of the seventeen TOCs contacted to seek their views responses were received from nine of them. The following sections describe these responses.

D1.2 Chiltern Railways (CR)

In addition to the completed Reporter questionnaire, CR provided a number of PPRP trackers for consideration.

There was little to no measure of success/on-going monitoring other than whether the binary schemes were completed or not.

CR did not provide additional information to support their view that the Network Rail PPM trajectory was lower than expected.

CR identify a new issue associated with driver shortage. Recruitment will take at least twelve months to demonstrate any performance improvement against driver shortages, once the training and lag is considered.

Our observations from their response:

CR had too many fleet initiatives (they’re all laudable and need doing) however the sheer number indicated that fleet will be a performance risk.

CR were sourcing obsolete components for existing rolling stock.

Comments provided from CR did not reflect that the establishment planning for Train Managers would be associated with a lag in benefits being realised.

CR noted that there was a stated shortage of staff in Control, but the staff were happy to work overtime and do other roles which was considered a high risk as it was reliant on non-contractual time.

The train planning team was stated to be running on overtime. This was not considered to be sustainable and posed a risk to delivery of timetables in industry timescales for STP / LTP or compliance other timescales.

Many of the initiatives were behind schedule, which would affect their ability to meet their performance targets and thus their side of the bargain.

The detail provided within the Chiltern Railways response supported the position that the Network Rail CP6 PPM trajectory should be lower than the TOC expectation.

D1.3 CrossCountry (XC)

XC indicated that there had been minimal engagement from FNPO. It was stated that this had been limited to the provision of a paper summarising their methodology and resulting CP6 PPM trajectory.

No revision had been made to the proposed CP6 entry position versus the recent decline in performance.

Key PPM benefits were anticipated during the 3rd and 4th quarters of 2018/19. These were associated with a number of fleet technical initiatives which were detailed in the XC response. No quantification of the anticipated benefit was provided.

Following commencement of the new franchise, the CP6 PPM trajectory was considered to need to take account of TOC on self-improvement plans.

No material engagement from FNPO relating to the revised CP5 exit position or the CP6 PPM trajectory was anticipated.

D1.4 Greater Anglia

GA did not complete the questionnaire but an email response was sent from their Head of Performance and Planning. The key points raised are summarised below:

GA stated that although their current performance improvement plans were shared with Network Rail, but that Network Rail had shown minimal interest to include in any performance benefit associated with new fleet and timetables having viewed these initiatives as significant risks. From the TOC perspective they viewed this as an inconsistent approach, as the corresponding potential benefit had not been considered by Network Rail.

It was noted that Greater Anglia and Network Rail had a joint working agreement for CP6.

GA stated that Network Rail had underestimated potential TOC benefits to performance, however no quantification of the effect on PPM was given.

D1.5 Govia Thameslink Railway

GTR presented eight slides at the South East Route meeting. The Reporter was directed to make use of these slides to address the points raised within the questionnaire.

This TOC were present at the Route meeting suggesting a strong working relationship and active collaboration.

There were ongoing timetable problems on the Route, but the Reporter was unsighted on the solution timeframe. This undermined confidence, especially given day to day performance was, at the time of writing, variable.

An emerging new fleet risk was identified with the Class 717 fleet. This was because the new fleet was not meeting the planned reliability targets.

It was noted that whilst the process was agreed; the targets were not. This reflected TOC uncertainty in their capability to resolve the current timetable difficulties. The stated position was that the timetable change would be performance neutral. This was not considered credible.

Service recovery was referenced in relation to trespass and vandalism; however, given the uncertainty in timetable phasing and actual delivery it was considered that the overall ability to provide service recovery was significantly compromised.

Whilst the TOC remained certain in delivering its contribution to the CP6 targets, overall confidence in the trajectory remained low because of:

- Daily performance variability;
- New fleet delivery generating uncertainty;
- Class 700 performance; and
- Uncertainty/lack of visibility of the confidence in delivery of the re-phased timetable.

Confidence in GTR delivering its contribution to the CP6 target is low.

D1.6 Keolis Amey (KA)

There was evidence that Network Rail had been engaging with the new franchisee, Keolis Amey.

KA performance plans were focused on ‘Passenger Time Lost’ not PPM, which they noted may have a detrimental effect on the CP5 PPM exit forecast. This was explained

as on-time performance measured at all stations and not just terminating stations as with PPM, which did not necessarily lead to an improved PPM.

KA and Network Rail aimed to produce an updated Joint Performance Strategy by 14th October 2018. This would include a detailed five-year CP6 strategy ready for sign off by 31st May 2019.

The overall production of a joint performance strategy update was clearly a defined objective, however given that the likely TOC led initiatives were substantial and high-performance risk, it was considered that caution should be applied to the accuracy of the TOC performance improvements being claimed. For example, the risks associated with:

- An entirely new fleet presents a series of 'bathtub curves' for fleet performance;
- New infrastructure using new technology; untried Tri mode trains;
- Electrification schemes are disruptive and delay to them will prevent stated performance improvements being delivered through new fleet;
- Possibility of DOO deployment with new fleet is likely to risk industrial action;
- Increase in services and frequency will increase infrastructure maintenance requirements;
- Traffic Management System deployment is still embryonic technology;
- GWML electrification impacts will disrupt services into Cardiff and Swansea since Western is lead Route, there was an unstated risk of delay contagion;
- The cultural change / improved control processes / new technology / analytics were unstated and not defined; and
- Improvements to summer performance were unstated.

KA has ambitious initiatives for Wales. The updated Joint Performance Strategy would need to critically evaluate these with respect to their effect on PPM.

D1.7 LNER

The unprecedented downturn in performance following the May 2018 timetable change effected LNER around Leeds / York / Doncaster / Newcastle in the north, and Peterborough – King's Cross in the south. As such, LNER were correct to identify the risk of their performance PPM trajectory changes which would be largely outwith their control. That Network Rail broadly agreed with this view was reassuring.

It was noted that the LNER fleet is due for replacement, and the inevitable performance dip in performance would need to be brief to ensure the rapid performance improvement that is forecast for CP6.

The twelve-point plan referenced by the TOC did not detail the benefits it would deliver, nor the applicable timeframes; so it was considered that caution should be applied to deliverability.

It was considered that the LNER fleet remained a challenge until replacement due to age and obsolescence.

The emphasis remained on GTR, Northern and Network Rail to resolve their ongoing timetable difficulties to provide the basis for a performance improvement. The lack of a visible plan, and therefore assurance in the recovery plan, was concerning.

LNER remained concerned about the risk of the May 2018 timetable changes on their performance PPM trajectory.

D1.8 Southeastern

Southeastern accepted and supported the methodology adopted by Network Rail. However, the PPM trajectory had not been accepted because it would not meet 'customer expectations'

Remedial steps to address reaching forecast CP5 exit performance were provided but these lacked credibility because the overall performance improvement contributions were not stated nor was any level of assurance provided, despite the TOC's statement of 'high confidence in delivery':

- DfT and Network Rail System Operator formed a view of performance targets for the new franchise as part of the ITT process. Whichever bidder was successful had plans to meet those targets, therefore stating the existing TOC schemes could not be considered as contributory is disingenuous.
- The TOC had suffered well publicised weather delays and high-profile mass trespass events caused by weather aggravated by poor contingency planning and training. These events were not explicitly referenced as performance improvement themes; therefore a recurrence was considered more likely without intervention.

Network Rail PPM trajectory suggested its performance would be greater than the level set within the ITT for the Southeastern franchise.

D1.9 West Midland Trains

The Franchise Agreement targets set by the DfT excluded the impact of HS2. WMT required the Route PPM trajectory to match the Franchise Agreement otherwise WMT would fil to deliver on its targets.

The TOC was expecting Network Rail to prove that their iPAT Performance improvement plans were fit for purpose and clearly executable.

WMT had not seen what Network Rail was predicting for CP5 exit with the first meeting scheduled for 7th September 2018.

The TOC believed that their PIP schemes were significantly over delivering however no evidence was provided to support this assertion.

WMT succinctly state that "*The key issue here is that it is not about what we believe we will achieve it is about what we need to achieve to meet our Franchise Agreement. As things stand we are significantly adrift. Given the level of change likely to impact the TOC and Network Rail, including significant schemes such as HS2 and the introduction of new train fleets, attempting to accurately predict forward 5 ½ years to the end of CP6 is fraught with considerable risk. Without the benefit of sophisticated modelling it would be remiss of us to sign up to anything other than the Franchise Agreement targets previously mentioned. The Bid process asked us not to consider the HS2 performance risks and for that reason alone we may need to revisit performance benchmarks*".

WMT was concerned that if Network Rail was forecasting very low level of performance improvement and that these were agreed, then WMT had no current mechanism to challenge Network Rail back on these.

WMT would only sign up to a performance PPM trajectory that satisfied their Franchise Agreement.

Appendix E

CRM-P to PPM Calculation Review

CRM-P to PPM Calculation Review

E1 Introduction

For CP6 a new measure of train performance called the Consistent Route Measure - Passenger Performance (CRM-P) will be adopted. This measure has been defined by the ORR to allow comparison of performance between the Routes.

The "*Consistent Route Measure – Passenger Performance*" (CRM-P) has been defined as:

"Annual minutes of NR-attributed delay to in-service passenger trains from incidents occurring within the route boundary normalised by the actual distance travelled by in-service passenger trains within that route"

The calculation of CRM-P CP6 forecasts was carried out using a central spreadsheet model by the National Performance Analysis Team, based on the forecasts of PPM for each TOC as provided by the Routes. As well as an overall PPM forecast, the Routes were required to provide a breakdown of the forecast PPM change each year attributable to Network Rail and the TOC separately.

Network Rail has used TOC PPM forecasts as the common currency from which to derive CRM-P forecasts, and developed a model to convert between PPM and CRM-P delay minutes based on historical relationships.

As part of our previous work[11] we reviewed this Network Rail model to confirm the calculation approach, and to test the sensitivity of CRM-P to changes in PPM, i.e. particularly to understand how sensitive the Routes' CRM-P projections are to their underlying PPM change assumptions.

Under the current Mandate we were asked to audit the Network Rail model which converts CRM-P trajectories to TOC-level Network Rail delay minute trajectories which is the reverse of the model that was previously looked at to convert TOC level PPM trajectories into the route-level CRM-P trajectories.

To develop forecasts of its regulatory performance measure for CP6, the "Consistent Route Measure – Passenger Performance" (CRM-P), Network Rail developed a forecasting model. This was used to convert Route forecasts of PPM for each TOC for which they lead into a CRM-P trajectory for the Route.

Network Rail has subsequently developed a 'reverse' version of this model to convert CRM-P forecasts for each Route into Network Rail delay minute forecasts for each TOC (and subsequently PPM forecasts for each TOC). This model may be used to convert ORR-determined Route-level CRM-P forecasts into TOC-level Network Rail delay minutes trajectories for use in the Schedule 8 recalibration if required.

[11] Arup (2018) Network Rail L4AR004b: Assessment of train performance trajectories in Network Rail's Route Strategic Plans for PR18 Issue v3 | 11 June 2018

ORR and Network Rail requested the Independent Reporter team to audit the CRM-P => Network Rail delay minute forecast model. This report summarises our findings.

E2 Source Material

Network Rail's National Performance and Analysis Team (NPAT) provided the study team with the latest version of the following models on 11th September 2018:

- PPM => CRM-P model: "PPM to CRM-P Conversion Model_V4.9.xls"
- CRM-P => Network Rail delay model: "PPM to CRM-P Conversion Model_REVERSE.xls"

The latter model is the sole focus of this audit.

The study team subsequently met with the NPAT team on 12th September 2018 in Milton Keynes to walk through the calculation process of the CRM-P => Network Rail delay model.

E3 Review of Model Structure

The CRM-P => Network Rail delay minutes model is based on an identical structure to the PPM => CRM-P model. This uses the same data sources, and the calculation spreadsheet contains broadly the same tables in the same cells as the PPM => CRM-P model.

The key difference is that the calculations are effectively reversed, such that the CRM-P trajectories by Route become the input as opposed to PPM trajectories by TOC. The calculations then work from right to left in the calculation worksheet ("REVERSE") as opposed to left-to-right in the PPM => CRM-P model.

The flow chart on the following page has been developed to describe the calculation process along with relevant data inputs. Cell references in this chart relate to the "REVERSE" worksheet in this model (the main calculation sheet), with colour coding as follows:

- Yellow: User defined inputs (i.e. CRM-P);
- Blue: Inputs calculated from historical data;
- White: Calculations; and
- Green: Key outputs (i.e. Network Rail delay per 100 km by TOC and PPM by TOC).

For all inputs calculated from historical data, the worksheet in the model where this data is referenced has been listed. The calculation process in this flow chart is repeated for each year of CP6, plus the final year of CP5 (2018/19).

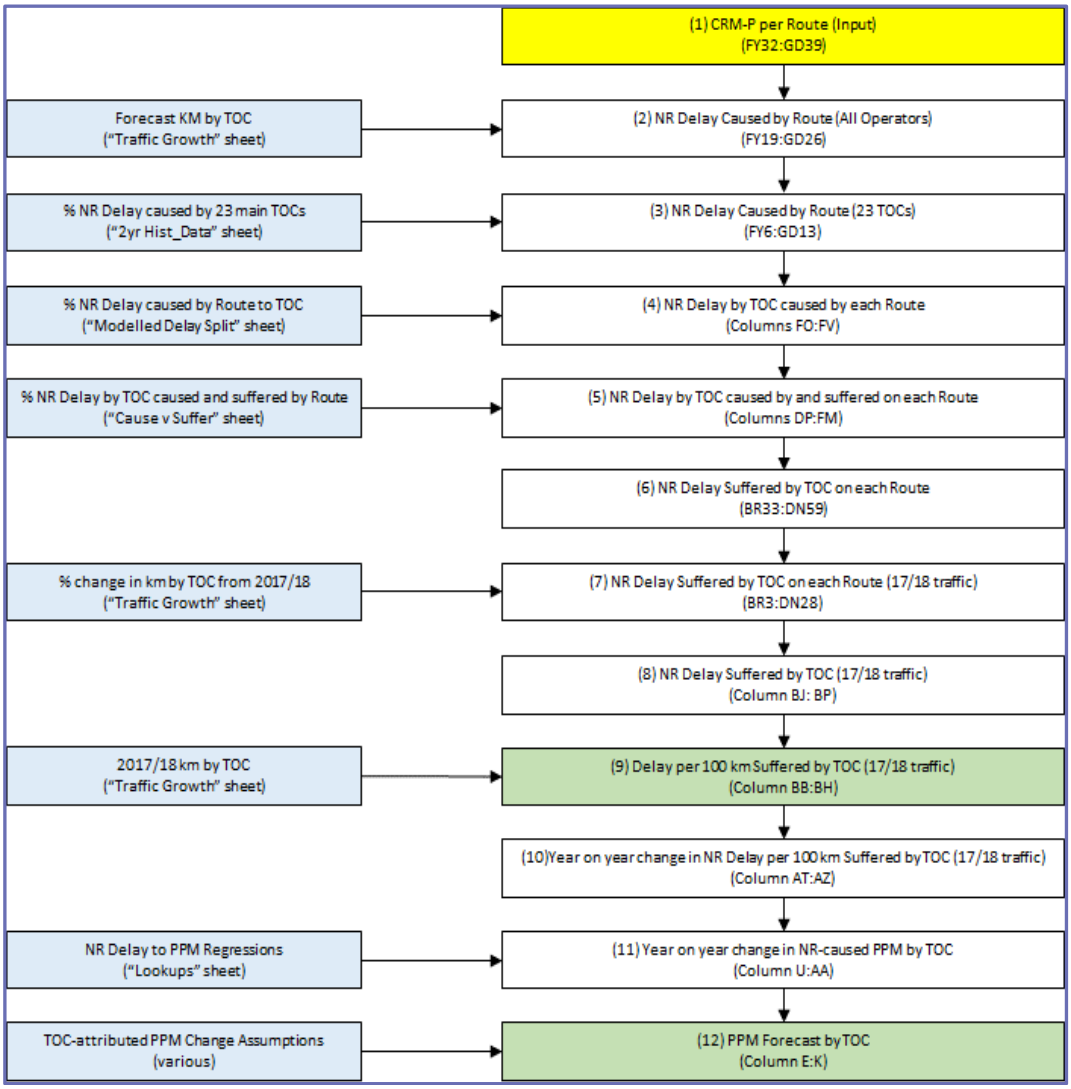


Figure 5-1: CRM-P to PPM Process Flow Chart

E4 Calculation Review

The review has undertaken a full calculation review of the model and it is confirmed that it is working as intended (i.e. as described to the study team by the NPAT), and referencing the correct data inputs.

To test the calculations, the review input the latest Target CRM-P figures for each Route into the model and compared the resulting Network Rail delay per 100 km for each TOC with that generated from the PPM => CRM-P model. Since this is a reverse calculation, it would be expected that these numbers would be very close. This comparison is summarised in the table below.

TOC	Network Rail Delay per 100km (2023/24)		
	PPM => CRM-P Model	CRM-P => NR Delay Model	Difference
ATW	1.58	1.58	0.00
c2c	0.41	0.41	-
Caledonian Sleeper	1.55	1.55	0.00
Chiltern	1.31	1.31	0.00
CrossCountry	1.36	1.36	0.00
EMT	1.35	1.35	0.00
Grand Central	1.22	1.22	0.00
Greater Anglia	1.67	1.67	0.00
GTR	2.38	2.39	0.01
GWR	1.81	1.81	0.00
Heathrow Express	2.37	2.37	-
Hull Trains	0.89	0.89	-
London Overground	1.61	1.61	0.00
MerseyRail	1.22	1.22	-
Northern	1.60	1.60	0.00
ScotRail	0.93	0.93	0.00
Southeastern	2.53	2.53	-
SWR	2.56	2.57	0.01
TfL Rail	1.27	1.27	-
Transpennine Express	1.51	1.51	0.00
VTEC	0.95	0.95	0.00
VTWC	1.24	1.24	0.00
West Midlands Trains	1.64	1.64	0.00

Table 5-1: Model Validation by TOC

As noted in the table, in most cases, the two figures matched to two decimal places. There were minor differences for most TOCs and this is caused by different levels of traffic growth for TOCs on different Routes (e.g. different growth forecasts for TransPennine Express on London North Eastern and London North Western Routes). The differing order of the calculations (and when traffic growth by TOC and Route is applied) means that this leads to minor differences in the amount of TOC delay calculated to be caused by, and suffered, on each Route. Our assessment, as summarised in the table above, is that this has no material impact on the outputs.

E5 Observations from Model Audit

From the audit and discussions with NPAT, four areas for further note were identified:

- Process for attributing Network Rail caused delay forecast by Route to each TOC;
- Impact of TfL Rail adjustment in PPM => CRM-P Model;
- Process for forecasting overall PPM by TOC; and
- Model label updates required.

The following sub-sections provide more detail for each of these four issues.

E6 Process for Attributing Network Rail caused Delay Forecast by Route to each TOC

In step (4) of the flow chart, the forecast of Network Rail caused delay for each Route in each year is attributed to each TOC based on the proportions calculated in the PPM => CRM-P model for the "Target" CRM-P forecasts.

As an example, in 2018/19 the PPM => CRM-P model forecast that 63.8% of Greater Anglia delay was caused by Anglia Route. Thus, when attributing overall delay caused by Anglia Route amongst TOCs, the CRM-P => Network Rail delay model assumes that 63.8% of Network Rail caused delay in 2018/19 will be to Greater Anglia.

Network Rail recognise this as a necessary model simplification, since there are multiple ways that delay could be attributed amongst TOCs if calculating from first principles. This approach ensures consistency with the original CRM-P forecast model, and so the model is appropriate for calculating the impact of scaling up or down the CRM-P forecasts compared with the Target forecasts. This model would therefore not be appropriate if major changes to CRM-P figures were proposed which would be expected to significantly change the attribution of Route-caused delay between TOCs.

The review repeated this test for the "Upper Scenario" CRM-P figures. As a note, this required the data in the "Modelled Delay Split" worksheet to be updated to reflect the 'Upper Scenario' outputs in the PPM => CRM-P Model to ensure the Network Rail delay figures broadly matched between the models.

E7 No Account of TfL Rail Adjustment in PPM => CRM-P Model

The latest version of the PPM => CRM-P model includes an adjustment for Western Route to account for a mismatch in the data for TfL Rail services. The reason for the adjustment is that the Route forecast for TfL Rail PPM does not include the Heathrow Connect services on Western Route. These were also excluded from the GWR PPM forecast. However, Heathrow Connect services were included in GWR historical delay data.

To adjust for this, an offline calculation of the impact of excluding Heathrow Connect services from the GWR baseline delay and applying a projected PPM change for Heathrow Connect services (based on projected TfL Rail PPM change) on Western Route was conducted. This was calculated as an adjustment to CRM-P for Western which was overlaid on the figure calculated in the model. This was found to have only a marginal impact on Western CRM-P (0.006 minutes or around 3,000 minutes per year).

Since this adjustment is calculated outside the main PPM => CRM-P model, it may have a minor impact on the forecasts of TfL Rail and GWR delay minutes in

the CRM-P => Network Rail delay model. For example, the CRM-P => Network Rail delay model attributes just 0.005% of Network Rail delay caused by Western Route to TfL Rail (from the table in cells FO200:FV226 in the "REVERSE" sheet), whereas the adjustment calculations by Network Rail indicates that approximately 1.7% of Western Route caused Network Rail delay is due to TfL Rail services.

This means the overall TfL Rail Network Rail-caused delay forecast may be marginally too low (and GWR marginally too high). However, given the GWR distance data includes the Heathrow Connect services, it is consistent with delay forecasts suggesting that any impact on normalised delay forecasts (by km) is not likely to be material.

For completeness, it is recommended that Network Rail review the implications of the Western CRM-P adjustment applied to the PPM => CRM-P model and determine whether this should be reflected in the model.

E8 Process for Forecasting Overall PPM by TOC

While the core remit for this audit is the forecast of Network Rail delay minutes, for completeness the review has considered the subsequent forecast of PPM for each TOC. The model currently conducts two separate forecasts:

- Cells E4:K26 – PPM forecast by TOC based on the forecast change in Network Rail delay only, i.e. no TOC-attributed PPM change assumed; and
- Cells E31:K53 – PPM forecast by TOC based on the assumption that TOC-attributed PPM will change pro rata to changes in Network Rail-attributed PPM, using historical ratios. For example, on TPE there were 0.82 TOC-attributed PPM failures for each Network Rail PPM failure, so the model scales the Network Rail-attributed change in PPM by 1.82 to give an overall change.

It is suggested that a third table may also be useful which uses the Route's originally assumed change in TOC-attributed PPM. A change in CRM-P trajectory may not necessarily impact the TOC-attributed PPM changes forecast, e.g. if driven by initiatives to improve fleet reliability.

E9 Model Label Updates Required

It is noted that the labels for each table in the "REVERSE" sheet remain as per the PPM => CRM-P model. It is recommended that these are updated where relevant to provide clarity as to what each table is showing. Three tables have been identified which would benefit from clearer labelling:

- Table for Step (2) in flow chart:

  - Current label reads "INCREASE TO INCLUDE MINOR TOCs (based on two years of history)"
  - Suggest updated to "Network Rail Delay by Cause Route – All Operators"

- Table for Step (6) in flow chart:
  - Current label reads "Uplift by traffic growth (change relative to 1718 baseline for each TOC & route combination)"
  - Suggest updated to "Network Rail delay split by Route where it is suffered (based on two years of history) – with forecast traffic growth"

- Table for Step (7) in flow chart:
  - Current label reads "NR Delay split by route where it is suffered (based on 2 years of history)"
  - Suggest updated to "Network Rail delay split by route where it is suffered (based on two years of history) – 2017/18 traffic levels"

It was also observed that the data in the table in Columns AO:AR do not appear to be used in this model, so it is suggested that this data be removed.

E10 Conclusion

The review found that the model calculations are working as intended, and that the model is fit for purpose for converting CRM-P into normalised Network Rail delay minutes for each TOC.

The caveat is noted that this model uses the same attribution of delay caused by each Route to each TOC as the PPM => CRM-P model. This model would therefore not necessarily be appropriate if major changes to CRM-P figures are proposed which were expected to significantly change the attribution of Route-caused delay between TOCs. In such a situation, it may be expected that the Routes should be asked to re-assess how the new CRM-P targets could be met.

This audit has identified the following actions:

- Review the implications of the Western CRM-P adjustment applied to the PPM => CRM-P model and whether this should be reflected in the CRM-P => Network Rail delay model;
- Produce a PPM forecast table which applies the Routes' projection of TOC-attributed PPM change; and
- Update the table labels in the model for clarity.

Appendix F

Audit of PPM to CRM-P Model

Audit of PPM to CRM-P Model

F1 Introduction

To develop forecasts of its regulatory performance measure for CP6, the "Consistent Route Measure – Passenger Performance" (CRM-P), Network Rail (NR) developed a forecasting model. This was used to convert the Routes' forecasts of PPM for each TOC into a CRM-P trajectory for each Route.

As part of the earlier PR18 work, the Reporter reviewed the PPM => CRM-P model. ORR has since raised some concerns regarding this model and asked Network Rail to provide worked examples to demonstrate the calculation process. ORR has asked the Independent Reporter team to audit the PPM => CRM-P model, undertake a review of the worked examples, and help address the concerns raised. Our findings are summarised in this report.

F2 Source Material

Network Rail's National Performance and Analysis Team (NPAT) provided us with the latest version of the model on 11th September 2018:

- "PPM to CRM-P Conversion Model_V4.9.xls"

We subsequently met with the NPAT team on 12th September 2018 in Milton Keynes. At this meeting, it was confirmed that the overall structure of the model has not changed since the previous review in May 2018, with two exceptions.

- The PPM inputs have been updated to reflect the Routes' latest forecasts. These were supplied to us as a separate file ("NR Share_V9.xls"); and
- A mismatch was identified in the base data for the former Heathrow Connect services on Western Route, so an adjustment to the Western CRM-P forecasts has been calculated, which is described in Section 4. This adjustment was calculated in a separate file which was provided to us for review ("PPM to CRM-P Conversion Model_V4.9 - Adjusted EX and EF.xls").

F3 Review of Model Structure

The PPM => CRM-P model was developed by NPAT to generate forecasts of CRM-P for each Route for the final year of CP5 (2018/19) and each year of CP6, based on the forecasts of PPM for each TOC as provided by the Routes. As well as an overall PPM forecast, the Routes were required to provide a breakdown of the forecast PPM change each year attributable to Network Rail and the TOC separately.

CRM-P was then calculated based on:

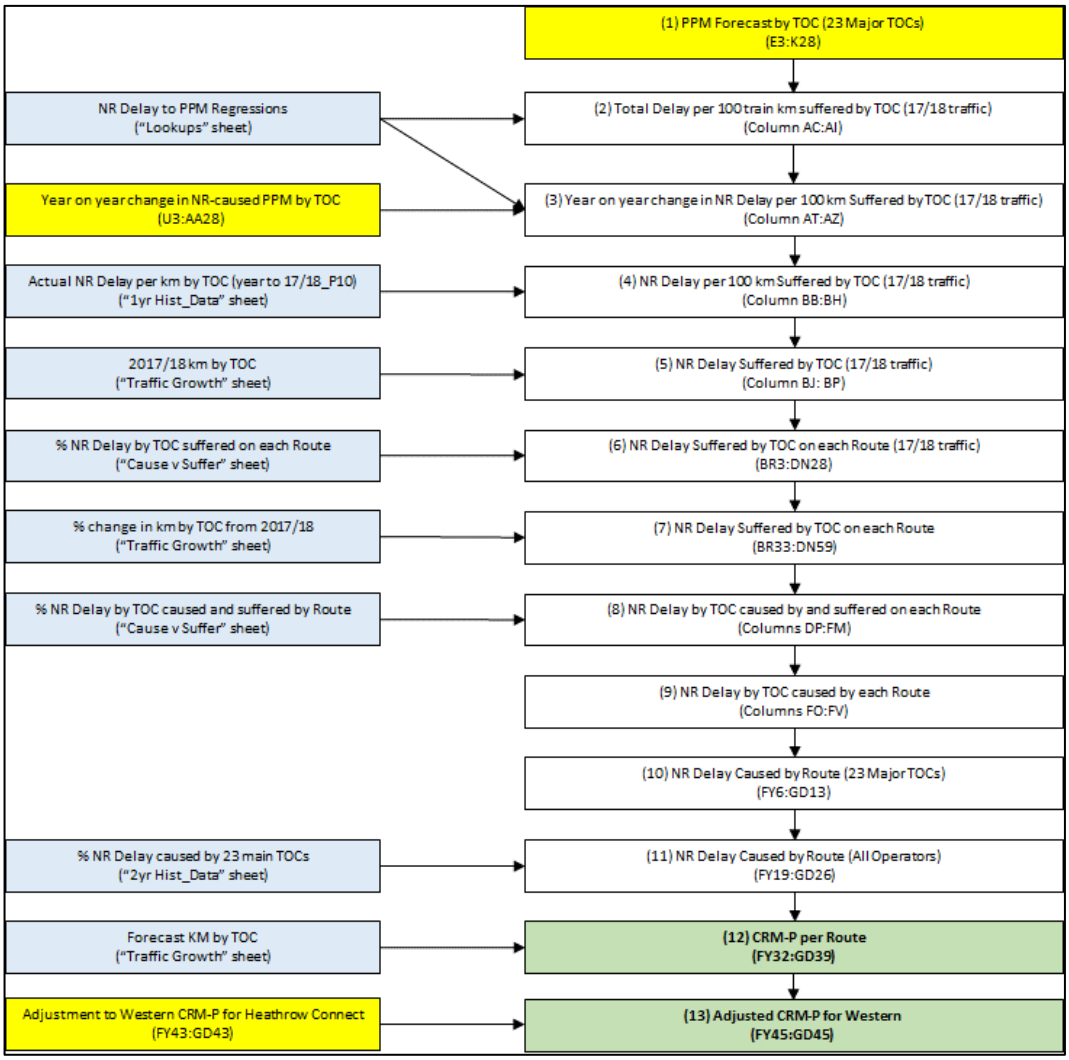
- Applying historical relationships between PPM and delay minutes for each TOC to convert the projected change in NR-attributed PPM failures in each year into a change in Network Rail delay minutes;
- Using historical levels of NR-caused delay for each TOC by 'Cause Route' (the incident location) and 'Suffer Route' (the event location) to allocate the delay forecasts by Route, e.g. how much delay suffered by TPE on LNW Route was caused by LNW Route, LNE&EM Route, Scotland Route, etc; and
- Uplifting delay minutes for each TOC on each Route to reflect increased train miles, based on NR's traffic growth forecasts for CP6.

The flow chart on the following page has been developed to describe the main calculation process along with relevant data inputs. Cell references in this chart relate to the "Target Scenario" worksheet in this model, which calculates the Target CRM-P trajectories. There are two separate worksheets which calculate the Lower and Upper limit trajectories ("Lower Scenario" and "Upper Scenario" respectively) and follow the same structure.

The colour coding in the flow chart is as follows:

- Yellow: User defined inputs (i.e. PPM by TOC);
- Blue: Inputs calculated from historical data;
- White: Calculations; and
- Green: Key outputs (i.e. CRM-P by Route).

For all inputs calculated from historical data, the worksheet in the model where this data is referenced has been listed. The calculation process in this flow chart is repeated for each year of CP6, plus the final year of CP5 (2018/19).



The final step (13) to adjust the CRM-P for Western is explained in more detail in Section 4.

The CRM-P trajectories (Target, Lower and Upper) are then summarised in the "Control" sheet in this model, and rounded to 2 decimal places in the "OUTPUTS" sheet in preparation for input into the Routes' Scorecards.

The Floor CRM-P values for input into the Route Strategic Plan are also calculated in the "Control" worksheet. The Floor is calculated based on a 'buffer' which reflects the maximum deviation (in minutes) from the Target in each year. The buffer is calculated as a proportion of the latest calculated CRM-P MAA value at the time of production (2017/18 Period 10), and the absolute minutes value applied to the Targets in each year of CP6.

The percentage used to calculate the 'buffer' is defined in Column V of the "Control" sheet, and has been set to 30% for each Route in the version we have audited. Using an example to outline the calculation, LNW's CRM-P MAA in 2017/18 Period 10 was 1.64 minutes, so the buffer is calculated as 0.49 minutes. LNW's Target CRM-P in 2019/20 was calculated in the model as 1.70 minutes, so the Floor for that year is set at 2.19 minutes.

F4 Adjustment to Western CRM-P for Heathrow Connect

One adjustment has been made to the model since the review in May. As shown in the flow diagram in Section 3, the final step is to adjust the Western Route CRM-P to account for a mismatch in the data for the ex-Heathrow Connect (EX02) services which were part of the GWR franchise, but were transferred into the TfL Rail concession in May 2018.

The reason for the adjustment is that the Route forecast for TfL Rail PPM does not include the EX02 services on Western Route, just the EX01 services running between Shenfield and Liverpool Street. The EX02 services were also excluded from the GWR PPM forecast. However, EX02 services were included in GWR historical delay data.

To adjust for this, a separate spreadsheet was produced which calculated the impact of excluding EX02 services from the GWR baseline delay, and applying a projected PPM change for EX02 services on Western Route. Key assumptions in this calculation were that EX02 PPM will change by the same margin as that projected for EX01 services in Anglia, and that 50% of this change will be to NR-attributed PPM.

This spreadsheet calculates a change in Network Rail delay minutes caused by Western Route to EX02 services. This is then normalised by projected train kilometres on Western Route to give an adjustment to CRM-P. This adjustment is read directly into the PPM => CRM-P model in cells FY43:GD43, from which an adjusted Western CRM-P forecast is calculated in cells FY45:GD45. It is these figures for Western which are then fed through to the final tables in the "Control" sheet.

This adjustment only has a marginal impact on Western CRM-P (0.006 minutes or around 3,000 minutes per year).

F5 Calculation Review

We have undertaken a full calculation review of the model and it is confirmed that it is working as intended (i.e. as described to the study team by the NPAT), and referencing the correct data inputs held within the model.

We have also audited the calculations in the worksheet provided by Network Rail to account for the Western adjustment described in Section 4 (PPM to CRM-P Conversion Model_V4.9 - Adjusted EX and EF.xls) and confirm that this is working as intended.

F6 Observations from Model Audit

No major issues were observed in the model audit.

The following minor issues were observed which will have no impact on the Target CRM-P calculations:

- In the version of the model audited, the Western CRM-P adjustment (as described in Section 4) is applied to the Target CRM-P figures only. For consistency, it is suggested that such an adjustment is also calculated and applied to the Lower and Upper scenarios.
- The Responsibility Split table in columns AO:AR of the "Target Scenario" sheet is not referenced in any calculations, and so it is suggested that this can be removed from the model.

For completeness, we note that this audit has focused on the process and calculations within the model only. This audit has not covered the veracity of the model input data as shown in the "1yr Hist_Data", "2yr Hist_Data", "Cause vs Suffer", "Lookup" and "Traffic Forecast" sheets.

F7 Review of Worked Examples provided to ORR

To help address ORR's questions on how the CRM-P forecasts were generated, Network Rail provided two worked examples to show how an assumed PPM change would impact CRM-P. These were outlined by Network Rail at a joint ORR / Network Rail meeting on 7th September 2018, and covered the following scenarios:

- In 2020/21 Wessex have assumed a 0.35% improvement in Network Rail PPM for SWR for Re-signalling Projects; and
- In 2021/22 LNE&EM have assumed a 0.55% improvement in Network Rail PPM for Northern.

These worked examples were provided in file "Worked CRM-P Examples.xlsx" and effectively followed the process outlined in the flow chart in Section 3 of this report. We have reviewed these worked examples to confirm the calculations, and that they are an accurate description of how the model works.

F8 Impact of TOC Initiatives in CRM-P Forecasts

ORR had expressed concerns over how the CRM-P forecasts reflect any TOC initiatives included within the Routes' PPM forecasts.

The key point of note is that the CRM-P forecast is only based on the Routes' projection of the change in NR-attributed PPM in each year for each TOC, regardless of who funds the scheme, i.e. based on the expected benefit to Network Rail only; so, for example:

- Infrastructure asset reliability schemes; these would derive a benefit to Network Rail attributed PPM, so **the full impact would be included** in the model
- Improved fleet reliability from new trains; this would derive a benefit to TOC attributed PPM, so **the full impact would not be included** in the model
- New trains may have better acceleration / braking thus improving ability to recover from disruption, and reduce reactionary delay; this would derive both a benefit to Network Rail attributed delay and TOC attributed delay, so **a proportion of the full PPM impact would be included** in the Model to account for the Route's view of the proportion of benefit which would be attributed to Network Rail

Each Route provided a forecast of the expected proportion of PPM change for each TOC in each year which would be attributed to NR. This forms a key input to the model, as noted as the input feeding into Step 3 of the flow chart in Section 3. To summarise this, the table below shows the projected change in PPM aggregated across the full CP6 period, along with the attributed Network Rail and TOC PPM change.

TOC	PPM Change	NR-attributed PPM Change	TOC-attributed PPM Change
Arriva Trains Wales	0.3%	0.1%	0.2%
c2c	0.0%	0.0%	0.0%
Caledonian Sleeper	0.0%	0.0%	0.0%
Chiltern	0.5%	0.0%	0.5%
CrossCountry	0.3%	0.0%	0.3%
East Midlands Trains	-0.4%	-0.3%	-0.2%
Grand Central	-0.4%	-0.3%	-0.1%
Great Western Railway	6.2%	2.2%	4.0%
Greater Anglia	-0.5%	-0.1%	-0.4%
GTR	3.0%	1.6%	1.4%
Heathrow Express	1.8%	1.1%	0.7%
Hull Trains	2.7%	1.8%	0.9%
LNER	10.0%	4.8%	5.3%
London Overground	0.5%	0.5%	0.0%
Merseyrail	0.5%	0.3%	0.2%
Northern	12.1%	4.1%	8.0%
Scotrail	3.2%	2.1%	1.1%
South Western Railway	3.8%	0.9%	2.9%
Southeastern	0.7%	0.5%	0.2%
TfL Rail	0.4%	0.2%	0.2%
Transpennine Express	7.0%	2.2%	4.8%
Virgin West Coast	-0.9%	-1.3%	0.4%
West Midlands Trains	0.3%	0.3%	0.0%

To reiterate, these figures do not relate specifically to Network Rail and TOC initiatives, but who will benefit from initiatives. From discussions with Network Rail we understand that Routes adopted different approaches to determining the Network Rail / TOC attributions in the table above. While some Routes have used detailed modelling, others have applied a more indicative approach.

From our review, we confirm that we do not have enough information from the model or from the Network Rail / TOC PPM attributions supplied by the Routes to calculate the proportion of the Network Rail-attributed PPM change for each TOC that is directly a result of TOC-funded initiatives.

F9 Conclusion

The review found that the model calculations are working as intended, and that the model is fit for purpose for converting the Routes' projections of NR-attributed PPM change into Route-based CRM-P forecasts.

Appendix G

Pre-Route Meeting Technical Note

Technical Note

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Project title	Mandate L4AR004c: Assessment of Network Rail's Response to the Performance Challenges within the Draft Determination	**Job number**	263537-00
cc		**File reference**	
Prepared by	Various	**Date**	07 November 2018
Subject	Pre-Route Meeting Early View		

G1 Background and Purpose

Arup, as the Independent Reporter, has been commissioned by Network Rail and ORR to deliver a review of Network Rail's response to comments made by the ORR and Reporter on its PR18 Route Strategic Plans published in February 2018. In particular, the review is based on consideration of the interim submission by Network Rail made on 13th July 2018 covering both operational performance and asset sustainability.

As part of the review the documentation submitted by Network Rail on the 13th July has been reviewed in relation to the original comments. Within the programme of planned activities, the review team is due to meet with the Routes who generated the updated trajectories.

Ahead of our formal draft reporting, ORR have asked for a Technical Note setting out our emerging view. It has been agreed that we would provide such a note to ORR and Network Rail on the basis that our opinion is still being developed and may change in light of our remaining work.

This Technical Note is a commentary on the initial findings the review team has developed on the documentation that has so far been considered ahead of the schedule of meetings with the Routes. The aim of this is to provide an initial view of the available evidence at this point, and to set the scene and direction for the engagement with the Routes. As noted above, they are very much thoughts at this stage and may or may not be verified by the ongoing work and then included in our final conclusions.

G2 Activities Undertaken

Access to the 13th July submission for the review team was made possible on 25th July. Within the submission directory of documents there are two sub-directories; one containing the performance responses from the Routes, and the other the sustainability data.

The following paragraphs describe the activities that have been undertaken following the arrival of the submission. Whilst the main interest has been on the Anglia, Wessex, South East and Wales routes, other route changes have also been considered. Breaking this down, the focus has been on:

4. Familiarisation with the submission;
5. Review of the FNPO performance trajectories (*information available 01/08*);
6. High level review of the overall outcomes from the new submission and the evidence provided, with focus on the methodology and the rationale employed;
7. Comparison of the submission with the performance outcomes of the Phase 2 final report;
8. High level review of the sustainability submission and the evidence provided in relation to the impact on performance trajectories;
9. Review of NTF outputs; and
10. Preparation for Route meetings and, in particular, drafting of additional questions to focus those discussions.

G3 FNPO Data Review (Task 1)

G3.1 FNPO Data Review (Task 1)

Task one was defined as the FNPO performance trajectory review, with an output of appreciation of FNPO issues. The data pack was delivered to Arup on 1st August 2018. Our initial comments are précised below. These identify areas that will need to be explained in the direct engagement with Network Rail.

It is not clear from the documentation provided how poorer performing freight commodity services will improve their punctuality as defined as in FDM/A2F measures.

An increase in passenger train services using the same route as freight services, makes it incumbent upon freight operators and terminals to accept and present services onto the network on time and adequately resourced; however, if Network Rail validate a path then increases in passenger services are immaterial; it is not clear if Network Rail is building in additional resilience measures to ensure the reliability of the FNPO network for punctual operations.

Similarly, it is uncertain if there is a strategic plan for improving paths. Is there a strategic plan for an FNPO route TRIP project to support an improvement in

FDM, or is TRIP now closed? It is not clear if there will be a strategic TPR review of critical areas where paths are at a premium. A strategic TPR review will positively affect FDM trajectories if the train plan is deliverable.

After reviewing the CrossCountry TOC CP6 performance trajectory documentation, it is unclear how Network Rail will reconcile the CP6 Final Determination figure against a trajectory that doesn't reach the planned exit point target of CP5. The CrossCountry franchise is due for re-let, and it is not possible to determine from the information available, how the figures showing decline were developed, and if the decline is agreed between DfT / Network Rail for the purposes of the bid ITT. This will impact CP6.

We could not determine from the documentation provided if there is a strategy that focuses on handing over trains between routes within FDM and measuring FDM at boundaries. At present we cannot plot which routes handle cross-border traffic most reliably. Reviewing FDM on each route and SFC is only part of the answer. This theme was highlighted in our previous submission regarding the CrossCountry TOC crossing route boundaries and featuring on route score cards.

The focus of the documents is on freight and understandably so given the proportion of services in the FNPO portfolio; but it was not possible to establish any strategic emphasis on improving Charter Train performance through CP6. With charter operators being limited to a regulatory cap of £5k per Schedule 8 incident, Network Rail is liable for the remainder of penalties. Accordingly, data should be provided that sets out a strategy for minimising charter delays through CP6, and reducing the Network Rail liability. This is raised as an issue because excluding regular itinerary charter movements (e.g. The Jacobite and Shakespeare Express regular timetabled steam hauled services) the services are operationally high-risk activities; typically one off operations using heritage equipment with unfamiliar passengers and crew.

Key route freight delivery metric (FDM) has been summarised in the table below for each of the routes. The consistently best performing Routes have been Scotland and LNE&EM, with LNE&EM associated with the greatest number of trains running. Both LNW and Anglia, which are the second and third busiest routes on the network, have also experienced progressive improvement over time. The lowest R-FDM values are associated with SE, which show a progressive decline over the past three years.

Route	Calculated FDM		Current 13 Period Total FDM
	Annual Three-Year Average	Annual Two-Year Average	
Anglia	93.5%	93.4%	94.5%
LNE&EM	95.1%	95.3%	95.6%
LNW	94.3%	94.3%	94.7%
Scotland	95.3%	95.4%	95.6%
SE	89.3%	87.9%	84.7%
Wales	95.0%	94.6%	94.4%
Wessex	94.4%	94.2%	94.6%
Western	94.2%	94.2%	93.8%
National	94.2%	94.2%	94.2%

The above table highlights dips in performance, with Western experiencing a dip of 4pp during the current period when compared to the previous calculated R-FDM. There are a number of possible reasons behind the observed R-FDM decline. The most likely commentary is associated with the change in mix of commodity. Coal as a percentage terms of total traffic declined enormously, and coal was a high performing commodity, evidenced in the documentation, means that the less high performing commodities have to work harder. However, we need to validate that the traffic flows on the affected declining routes (Wessex / South East / Wales) are attributable to change in commodity traffic.

South East route was affected by a significant derailment in Lewisham in the last 12/18 months which caused a significant blip in performance (line was shut for a good period of time), Wessex route has been affected by the Great Western Main Line Route Upgrade (electrification / line blockages and diversions) with diversions.

A planned decline in national FDM through CP6, the category that seems to be contributing most is 'national'. There is insufficient data for us to understand what 'national' is and why it will deteriorate. Likewise an increase in FDM failures by a factor of 420 is unexplained, and the mitigation's presented seem weak as they don't demonstrate a grasp of strategic issues and provide a strategic plan for resolution, followed by links to the more detailed plans that will underpin delivery of the strategy.

Freight is much more sensitive to the market fluctuations as well as external factors for example shipping and terminal delays. A threat of a national signallers strike caused a significant dip in rail freight tonnage. It is also noted that IR disputes will have impacted the SE route results and the ongoing timetabling problems will not be helping performance delivery.

To gain an improved understanding it would be necessary to have visibility of Network Rail's cancelled / deferred / planned / funded freight schemes so we can understand what benefits these schemes will or could unlock. There should be a proportionate dis-benefit that Network Rail should resolve in CP6 if they have not delivered the schemes they were funded for in CP5.

G3.2 Performance Review (Task 2 part)

Task two was to review the Network Rail submission, with outputs agreed as;

11. Assessment of credibility of the revised trajectories; and

12. Meeting notes from all meetings with Network Rail.

The following sub-sections describe progress in each of these areas.

G3.2.1 Assessment of Credibility of the Revised Trajectories

We received additional supporting evidence ex Network Rail Anglia via John Thompson.

In our report L4AR004b, 'Assessment of train performance trajectories', we made a number of recommendations which were listed in Table 1.2. This table is reproduced below, with additional column[s] detailing action to date.

Number	Recommendation	Benefits	Evidence of Implementation	Owner	Target Date for Completion	Progress at 03/08/18
2018APR01	It is recommended that ORR consider advising Network Rail of the required confidence level for the performance trajectories to allow Network Rail to provide a consistent and comparable set of trajectories across the routes					South East Route have revised their confidence level from P80 to P50.
2018APR02	It is recommended that Network Rail routes each produce a single document of assumptions made, and share their approaches adopted to date. And that Network Rail Central Team review the guidance on calculation of performance trajectories provided to the Routes and the degree to which the resulting performance trajectories are consistent and comparable across the Routes.	Improved consistency across routes	Documentation of assumptions made by each route	Network Rail	Publication of Final Determination	TBC
2018APR03	It is recommended that disparities between route performance	Improved joint planning	Joint planning	Network Rail	CP7	Review ongoing – see text provided

	trajectories and TOC Franchise commitments are identified and acknowledged.					below along with separate summary table.
2018APR04	Anglia to review its performance model and assumptions to check performance trajectories	Greater confidence in trajectories	Documented review	Network Rail	July 2018	Review of recently received Anglia data ongoing

2018APR03

The Table in Appendix 1 provides a summary of the SBP published PPM trajectories alongside the TOC franchise commitments. Where franchise commitments were not provided within the NTF forms, data has been extracted from the TOC supporting evidence as relevant.

We note that performance data for CP6 for the following TOCs are missing. Where provided for the South East route, in their "*Train Performance Response to the ORR Draft Determination"* it is unclear what the CP6 target should be listed as. This comment relates to the following TOCs:

TOC	**Route**
CrossCountry	FNPO
East Midland Trains (EMT)	London North Eastern
South Eastern	South East
GTR	South East
GWR	Western
Heathrow Express	Western

The GTR franchise finishes in 2021, and included in this franchise is Thameslink. We are unclear what the CP6 trajectory is for this TOC. Irrespective of the end date, it is critical there is a trajectory for this TOC which states expectations for this franchise beyond the end date. This should be agreed by Network Rail strategically and the DfT procurement team for this franchise. DfT have not yet stated their ambition for this franchise; whether it will be re-let 'as is' or split into constituent parts. Therefore, Network Rail should provide CP6 targets and trajectories for Southern / Gatwick Express / Thameslink and Great Northern, which can be either be amalgamated and normalised into one 'GTR' measure or split into constituent pieces, and it is these that should be reflected here.

Heathrow Express train operations are expected to merge into Great Western later in 2018, therefore we understand why a separate measure is not listed. However, notwithstanding the merger of Heathrow and Great Western; the lack of targets and trajectory for Network for CP6 requires resolution. The TOC will either receive a Direct Award or the franchise will be re-let. Irrespective of this, Network Rail and DfT which will specify the ITT and the performance metrics

within it should agree strategic targets through CP6 and it is these that should be reflected here.

To assist with the evaluation of the SBP performance trajectories, for TOCs which are at the end of their franchise agreements, it is suggested that if information is unavailable that the expected CP6 franchise trajectories should be requested from the DfT. This would be in accordance with the approach adopted by C2C, where data is provided in line with their franchise expectation.

Values for TOC franchise commitments for LNW for Chiltern, West Midland Trains and Merseyrail have been extracted from their respective CP6 Join Performance strategy documents as information was not inputted into the NTF table.

We note that Hull Trains and Grand Central are excluded from this as Open Access operators, but their performance will impact on the overall CP6 trajectory. Once their longer term position (network access and track access charges etc) is agreed, this will become more certain. However, the operators need to agree to and input into the CP6 targets and trajectory.

Having reviewed the data we note that there a gap of almost 6pp exists between the VTEC and LNER and the SRB trajectories. Further information is required to identified what has caused this gap.

It is proposed that further data detailing the forecasted PPM CP5 exit values be sought to clarify situation prior to CP6 entry. The data provided within by FNPO does not tally with data provided within TOC evidence for anticipated CP5 exit positions.

G3.2.2 Meetings

To date, we've only held one route meeting, on 31st July 2018, attended by Ian Hood (IH) and Andy Castledine (AC) representing Arup and John Thompson (JT) representing Network Rail Anglia route. We have not met any other routes, meetings are scheduled to start w/c 6th August 2018.

The notes are reproduced in Appendix 2.

We are in the process of setting up further meetings with route analysts and model keepers to understand the process to evaluate performance based on the increased spend.

G4 Sustainability Review

G4.1 Mandate Requirement

The Mandate states:

> *'… the reporter will be required to evaluate:*

Potential funding for asset sustainability and performance innovation.
Review and assure routes' responses on:

- *the validity of routes' responses to the potential funding*
- *the robustness of the re-calculations of any performance trajectories that have changed or should change, both for the lead route and any consequential impacts on other routes …'*

In our proposal we have identified Task 4 'Asset Sustainability and Performance Innovation' to consider the above.

The aim of this working note is to set out key background information, our assessment approach and emerging findings. The note summarises our thoughts on issues found to date and how they might impact our findings and has been prepared to allow discussion with ORR and Network Rail as work progresses. As noted above, they are very much thoughts at this stage and may or may not be verified by the ongoing work and then included in our final conclusions.

G4.2 Assessment Approach

We have based our assessment around the following questions:

Assessment Questions

A. *How have Network Rail linked asset management / reliability / sustainability to train performance in their SBP submission?*

B. *To what extent were additional projects / investments to improve 'performance' identified in the RSPs?*

C. *What additional Asset Sustainability and / or Performance Innovation spend have Network Rail now included in their July response?*

D. *Where is this additional spend targeted? (e.g. what asset types in what Routes?)*

E. *What evidence is there that this additional spend will give an improved performance?*

F. *If so to what extent is this quantified in terms of performance trajectories?*

These questions are considered below.

Documents reviewed are listed at the end of this note.

G4.3 Context

G4.3.1 Draft Determination[12]

We have not independently reviewed Network Rail's CP6 asset management / sustainability plans presented in their February SBP submission but ORR's view set out in the Draft Determination is summarised below

"Overall, we consider that Network Rail has followed a reasonable approach to understanding its asset base and to allocating the resources available in a way which reflects the strategic objectives of each route, while at the same time giving reasonable weight to safety, performance and compliance with its own asset policies…. [7.18 page 69]

Network Rail used a high-level aggregate measure of asset sustainability (CSI)[13] to predict the levels that would be achieved with the activity proposed. Analysis of the SBPs concluded that asset condition as measured by CSI will deteriorate by approximately 2% over CP6 compared with the predicted condition at the end of CP5. This predicted deterioration in average asset condition is not uniform across assets or routes. In particular, expenditure on track, structures (in particular metallic structures), earthworks and drainage have been specifically identified as areas of concern. The Scotland route plan delivers forecast asset condition that looks to be broadly acceptable, as the relatively moderate deterioration forecast in CP6 follows the improvement in condition over CP5. [7.20 page 69]

We have estimated that approximately 11% of additional work activity (by volume) would need to be added to renewals plans to fully address the forecast fall in CSI across GB. [7.21 page 69]"

The draft determination[14] challenged asset sustainability and identified a further £1bn investment in asset sustainability and established a performance innovation fund of £10m.

ORR expect Network Rail to reflect consequential changes to performance trajectories arising from any additional renewals spend as a result of this incremental funding.

G4.3.2 Network Rail's Response Dated 13 July 2018

In Network Rail's response[15] provided 13 July 2018, it has allocated £67m to Scotland Route and divided £933m amongst the England and Wales routes. It is noted that Network Rail routes only had three weeks to develop their submissions

[12] ORR 2018 periodic review Draft determination – overview of approach and decisions June 2018
[13] CSI, or the composite sustainability index, is equivalent to the change in the value of the infrastructure assets, based on their underlying condition, relative to their value at the end of 2013-14.
[14] ORR 2018 periodic review Draft determination – overview of approach and decisions June 2018
[15] NR Draft Determination Response – Asset Sustainability Summary V1.0 July 2018

and Network Rail recognise that the allocation is still in the early stages of development.

G4.4 Assessment Questions

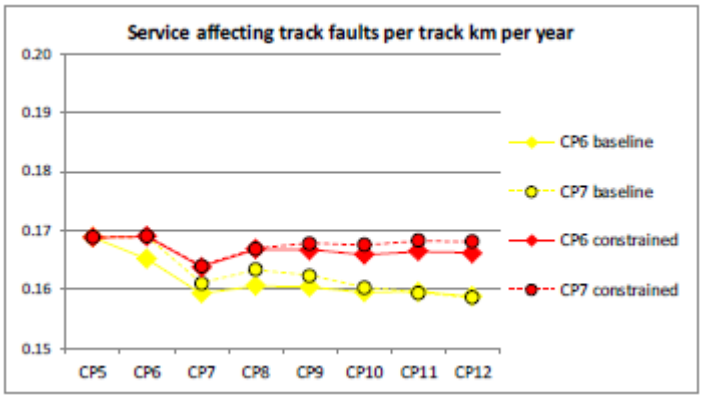
G4.4.1 How have Network Rail Linked Asset Management / Reliability / Sustainability to Train Performance in their SBP Submission?

To inform our assessment of Network Rail's Asset Sustainability response submitted in July 2018 we have undertaken a cursory review of the evidence submitted by Network Rail in their SBP submission that relates to the linkage between asset investment (maintenance and renewals) and performance. We have also spoken to a Senior Engineer in ORR's Asset Management team.

We have focussed on several documents to obtain a broad understanding of Network Rail's approach, namely assurance summaries produced by Network Rail for overall asset management, track and signalling (two asset categories likely to have the most direct linkage to service affecting failures). We have also read example Route Assurance summaries for Anglia and South East Route and the RSPs for these two routes.

Key points emerging are:

- Asset investment (maintenance and renewals) appears to have been focussed on sustainability / safety then performance with Network Rail workbanks prioritised on that basis;
- Network Rail has assumed that asset interventions on a safety basis will have an impact on performance (e.g. service affecting failures) however this performance improvement is mostly quantified using engineering judgement;
- The focus in CP6 will be on returning the asset condition to CP4 exit levels – Network Rail has used the high-level CSI measure to assess required;
- Routes seem to be targeting reductions in service affecting failures (e.g. Anglia track 12.5% reduction over the five year period of CP6) and corresponding improvement in reliability (composite reliability index – CRI) by 5%). The relationship between SAF and CRI is an area for development by Network Rail – at present there is no modelled correlation;
- Similarly, there is no modelled linkage yet between SAF / CRI and CRM-P or PPM;
- There is some indication that for track assets the linkage between asset interventions and reliability / failures has been modelled (though ORR has not seen the models or assumptions);



Source: Ref C Network Rail CP6 Track Assurance Summary page 12

- For most other assets it is unclear how the proposed reduction in failures and improvements in reliability have been quantified;
- There is some evidence of cross-asset trade-offs (e.g. South East Route – trade-offs with respect to sustainability). As noted above the focus seems to have been on safety then performance, with robustness and sustainability being primarily equated with safety; and
- It is also noted that the additional spend (£1Bn) from re-allocation is planned to be undertaken in the last two years of CP6 so as not to disrupt existing planning. This means that any performance benefits may be limited in CP6.

Key References

Network Rail February 2018 submission:

A. Network Rail CP6 Asset Management and Asset Activity, Summary Assurance Overview. Version 1.0

B. Network Rail CP6 Route Strategic Plan - Assurance Summary: Signalling includes Asset Policy, Renewals and link to maintenance activity

C. Network Rail CP6 Track Assurance Summary

D. Anglia Route Strategic Plan Assurance Report

E. South East Route Strategic Plan Assurance Report

F. Anglia Route Strategic Plan 19th January 2018 v2.2

G. South East Route Strategic Plan Issue 5.0 9th February 2018

G4.4.2 To What Extent were Additional Projects / Investments to Improve 'Performance' Identified in the RSPs?

The Network Rail Route Strategic Plan template included for Routes to include 'Scenarios' (options) as Appendix D to the RSP. The following table summarises additional projects proposed by the Routes in their Feb 2018 RSPs that primarily relate to performance improvement.

<table>
<tr><th>Route</th><th>Additional (Unfunded) Performance Improvements identified in RSP</th></tr>
<tr><td>Anglia</td><td>Performance Benefits for Additional £133m included in Supplementary Evidence –PPM improvement qualitative. SOBC for Strategic Renewal Investment Options also provided – investment of £241m to give up to c.0.3% PPM improvement.</td></tr>
<tr><td>LNE&EM</td><td>Appendix D to RSP sets out options including East Coast Supplementary Plans e.g. Package 1 - circa £500m and Forecast VTEC / Grand Central / Hull Trains PPM increase of 1.5%, Forecast VTEC PPM year 3 CP6 of 88%, Forecast increase in GTR PPM during CP6 of 0.9%. RSP refers to quantitative model used to calculate impact.
<table>
<tr><th></th><th></th><th colspan="2">PPM Improvement (ppts)</th><th colspan="2">BCR (60 Year)</th></tr>
<tr><th>Supplementary plan investment</th><th>Cost (£m)</th><th>Virgin Trains East Coast</th><th>GTR (Great Northern)</th><th>With HS2</th><th>Without HS2</th></tr>
<tr><td>Package 1</td><td>495</td><td>1.5</td><td>0.9</td><td>2.75</td><td>Financially Positive</td></tr>
<tr><td>Package 2</td><td>742</td><td>1.8</td><td>0.9</td><td>1.10</td><td>4.81</td></tr>
<tr><td>Package 3</td><td>1,040</td><td>2.0</td><td>0.9</td><td>0.74</td><td>2.12</td></tr>
<tr><td>Package 4</td><td>1,446</td><td>2.1</td><td>0.9</td><td>0.48</td><td>1.01</td></tr>
<tr><td>Package 5</td><td>4,672</td><td>2.6</td><td>1.1</td><td>0.14</td><td>0.24</td></tr>
</table>
Table 17: Results of PPM and Business Case modelling of East Coast Supplementary Plan packages</td></tr>
<tr><td>LNW</td><td>Appendix D to RSP includes additional scenarios for CP6 and investment options e.g. customer focussed pledges (£110m) to achieve more resilient performance (PPM targets to be bettered by 0.5%). No quantitative modelling evidenced.</td></tr>
<tr><td>South East</td><td>Appendix D includes various Vision Schemes e.g. #1 'Performance Improvement' @ £166m, #3 'Metallic Structures' @ £39m, #6 'Track Sustainability' @ £181.2m.

Unclear if PPM improvement modelled or qualitative.</td></tr>
<tr><td>Wales</td><td>Appendix D to RSP includes 18 additional potential investment areas. No quantitative or qualitative PPM improvements provided.</td></tr>
</table>

Wessex	Appendix D to RSP includes performance improvement option (£85m) including additional plain line full renewal and refurbishment option for track with modelled outputs reduction of 0.3% delay mins by end of CP6 (0.5% and 1% reduction by end of CP7 respectively).
Western	Exeter to Newton Abbott Resilience Programme and Risk Details Report provided. Appendix D to RSP provides detail of Exeter scheme £286.2m – PPM benefit not stated.
Scotland	Appendix D to RSP has 4 additional business cases. None appear to relate specifically to performance / PPM improvement.

G4.4.3 What Additional Asset Sustainability and / or Performance Innovation Spend have Network Rail now Included in their July Response?

Network Rail state [Ref 2]

The principle guidelines for the route submissions were as follows:

- *Works should be selected primarily to improve asset sustainability, though wider benefits such as train performance should also be factored in.*
- *The focus should be on earthworks, track, drainage and metallic structures. Other items should be included where a strong local case exists, and choices should not be limited only to assets that form part of the Composite Sustainability Index (CSI) measure.*
- *Other relevant factors that should be considered when selecting packages of work:*
    - *The best value work that fits the overall management approach for the route, including efficient unit cost*
    - *Confidence in deliverability*
    - *How existing efficiency plans will be affected*
    - *Criticality or specific local context of the assets*
    - *Availability of monitoring and maintenance controls.*

The allocation of extra expenditure is summarised below:

	£m							
	Anglia	LNE/EM	LNW	South East	Wales	Wessex	Western	E&W Total
Allocation	77	225	222	145	66	87	110	933

Table 4.1 Allocation to routes of additional sustainability spend

G4.4.4 Where is this Additional Spend Targeted? (e.g. What Asset Types in What Routes?)

The following table summarises the incremental CSI Improvement in each route from the extra sustainability spend as calculated by Network Rail. [Note we have not seen or reviewed these models for CSI by asset]

	Additional CSI improvement from extra sustainability spend - end CP5 vs end CP6							
	Anglia	LNE	LNW	South East	Wales	Wessex	Western	E&W Total
Track	0.07%	0.27%	0.09%	0.50%	0.25%	0.64%	0.25%	0.25%
Earthworks	0.01%	0.14%	0.09%		0.67%	0.12%	0.15%	0.13%
Drainage								
Structures	0.23%	0.11%	0.16%	0.56%			0.20%	0.18%
Ops Property		0.04%					0.02%	0.01%
Signalling	0.11%	0.08%					0.11%	0.04%
Level Crossings								
E & FP								
Offtrack								
Total	**0.41%**	**0.64%**	**0.34%**	**1.06%**	**0.92%**	**0.76%**	**0.74%**	**0.62%**

Table 5.2 Summary table of CSI impacts by route and asset

G4.4.5 What Evidence is there that this Additional Spend will give an Improved Performance?

As a general comment before considering the individual submissions it is noted that the templated pro-forma which all of the Routes have used to set out their proposals for the available additional spend encourages consideration of the impact on performance. The opportunity to justify the allocation of investment to particular activities is clearly more focused on the sustainability of the asset base rather than performance improvement as such. Here the STE modelling of CSI impact has been used throughout. The routes have tackled the assessment of performance impacts in a number of ways ranging from a purely qualitative assessment with no further justification of this conclusion, to a quantified assessment made on the basis of the quantum of delay minutes and the associated costs through delay attribution, and the modelling of SAF impacts by the STE team using their model. The variation in approach for similar activities needs to be explored more.

In terms of the deliverability of the majority of the options identified statements are made in the option descriptions concerning the robustness of the scheme deliverability. From the planning perspective, and given the current planning that has been undertaken on the agreed workbanks, it is reasonable that a significant number of the options will be delivered towards the end of the Control Period. As a result the performance benefits will not accrue until 22/23 or 23/24.

It is noted that Scotland route were not required to submit a sustainability response.

The following table summarises the route responses (asset sustainability) and highlights where the route has made a linkage between the additional investment and improved performance.

Route	Commentary on Route Responses
	The introduction to the sustainability submission is very brief and does not refer to performance benefits at all. It is noted that the selection of options to make up their revised package is "based on deliverability of packages taking into account the best benefit against sustainability". This would appear to put the impact on performance low down the priority however around half of the 11 schemes proposed are noted as delivering a "significant" performance benefit. The spread of the spend is across a range of engineering disciplines including operational property delivering a 'significant' performance benefit through the creation of a new MDU depot. All of the impacts are qualitative but there is a short description of the performance impact assessment but the relativity of the assessment is not provided. As well as the core list which could be funded through the additional allocation analysis has been undertaken by the route of the benefits accruing from a number of other option from the RSP. On the face of it the benefits in terms of the impact on CSI and operational performance of some of these schemes appear to be better than those selected for inclusion in the allocated funding – ANG29 would be an example of this.
	The submission is very focused on sustainability with workbank activities that have been identified that will "drive performance improvements to the level expected of us by our ECML customers" held on a 'supplementary programme' list and therefore not funded in the allocation made to the route. Specifically, as an 'assumption' it is noted that the route had "limited ability to model the [performance] benefits for each package". The result is that their individual options are qualitatively evaluated against performance as either 'significant', 'marginal' or 'moderate'. The justification for this high-level assessment is provided in terms of a short descriptor of where this benefit will come from.
	The scene-setting of the submission provides a clear account of the way in which the option identification has been undertaken. Within the descriptor of the earthworks schemes there is reference to performance benefits. With the exception of the high criticality earthworks schemes which has been identified as having a 'significant' performance impact all of the other ten options only have "marginal" or no operational performance impact. There is a short descriptor of the justification for the qualitative assessment but no attempt to measure the impact.

South East	There are four packages of activity split between track and structures in the submission. It is noted that "The asset sustainability and train performance benefits have been quantified using the 'STE Track Sustainability' model". It is not clear why this is the only route to have used this approach to performance (or have identified that this was their approach). The use of this model has allowed the route to evaluate the performance impacts in terms of reductions in SAFs both in CP6 and CP7 as a result of the work. The impact from the structures interventions is linked to the avoidance of disruption costs. These are quantified in some detail. It is assumed that these figures have been derived from direct experience.
	In the scene setting justifying the selection of options to be delivered under the Route's spending allocation there is no mention of performance at all. The approach to the assessment of performance benefits for each of the schemes varies. For the drainage schemes an assessment has been made of the performance benefits quoting, for example, a 4% reduction in SAFs, representing around £57k in Schedule 8 payments. The evaluation of the SAF impact is not described and needs to be explained. For the track and geotechnical options the stated assessment of performance benefits is purely qualitative with no justification of how the assessment has been made. The structures scheme benefits are linked to the delay minutes from forecast projections with the quantification of delay minute benefits attributed to historic impacts.
	The submission is very focussed on necessary track and earthwork schemes which are believed by the route necessary to recover degrading sustainability in these two critical areas. The identified four key objectives used to define the prioritisation of works do not include performance. The two track packages are measured in terms of performance benefits by the reduction in the number of TSRs/ESRs plus the removal of sites at risk of speed restrictions. Whilst the former is quantifiable the de-risking is less so. For earthworks the benefits are noted as "minimising the risk of needing to use operational restrictions to manage safety … avoiding unplanned service affecting restrictions". This seems reasonable but difficult to quantify.
	The selection of options for delivery is noted as being based on "a balanced programme across our asset base". This picks up on the schemes which the route had identified in its RSP submission but had dropped out due to funding constraints. In terms of priority it is noted that the track schemes are linked to improvements in SAF/FWI risk. Within the individual option descriptions there is a mixture of approaches to the assessment of

performance impacts depending on the engineering discipline. The track options are specifically linked to their impact on the "long-term asset forecasting projection of SAF / year" leading on to an assessment of delay minutes and PPM failures. The impact for the structures proposal is quantified based on recent relevant delay minutes experience. The signalling scheme in Cornwall has been assessed in a similar fashion. The performance impact of the level crossing, drainage, earthwork, fencing, and building schemes have all be assessed qualitatively based on a short description.

Based on the foregoing we would wish to discuss with the individual routes:

13. What account was taken of performance impact in the original option selection? and
14. What options to assess performance were available to you and then how was the performance impact assessed?

G4.4.6 If so, to What Extent is this Quantified in Terms of Performance Trajectories?

Revised Performance Plans [Ref 3 page 16]

The revised CRM-P trajectories submitted by Network Rail post Draft Determination are summarised below:

	Draft CRM-P trajectory based on latest Route Plans									
	2019/20		2020/21		2021/22		2022/23		2023/24	
Anglia	1.45	*1.46*	1.45	*1.47*	1.45	*1.46*	1.45	*1.46*	1.45	*1.46*
LNE&EM	1.34	*1.34*	1.33	*1.33*	1.30	*1.30*	1.28	*1.28*	1.27	*1.27*
London North Western	1.62	*1.62*	1.61	*1.61*	1.62	*1.62*	1.61	*1.62*	1.59	*1.59*
Scotland	0.96	*0.96*	0.89	*0.95*	0.89	*0.95*	0.89	*0.96*	0.89	*0.95*
South East	2.99	*3.03*	2.94	*3.04*	2.85	*3.00*	2.81	*2.90*	2.78	*2.79*
Wales	1.54	*1.54*	1.54	*1.54*	1.54	*1.54*	1.53	*1.53*	1.52	*1.52*
Wessex	2.35	*2.35*	2.30	*2.30*	2.36	*2.36*	2.26	*2.27*	2.22	*2.22*
Western	1.80	*1.80*	1.77	*1.77*	1.74	*1.75*	1.71	*1.71*	1.69	*1.69*
										italics show the CRM-P trajectory in the SBP

Source: Network Rail Draft Determination Response – Train Performance July 2018

The table indicates that a number of the routes (Anglia, Scotland, South East, Western and Wessex) have changed their trajectories in the July submission.

Key References

ORR

1. ORR 2018 periodic review Draft determination – overview of approach and decisions June 2018

Network Rail July 2018 Submission

2. NR Draft Determination Response – Asset Sustainability Summary V1.0 July 2018
3. Network Rail Draft Determination Response – Train Performance July 2018

Anglia

4. Network Rail Anglia Route Draft Determination Response – Asset Sustainability V1.1 July 2018

LNE&EM

5. LNE&EM Route Draft Determination Response – Asset Sustainability V1.0 10th July 2018

LNW

6. LNW Route Draft Determination Response – Asset Sustainability Updated with CSI outputs V1.1 11th July 2018

South East

7. South East Route Draft Determination Response – Asset Sustainability V1.0 22 June 2018

Wales

8. Wales Route Draft Determination Response – Asset Sustainability July 2018 V1.3

Wessex

9. Wessex Route Draft Determination Response – Asset Sustainability V1.8 July 2018

Western

10. Network Rail Draft Determination Response: asset sustainability Western Route Version 1.1 6th July 2018

Appendix 1

oute	TOC	SBP Published Figure						TOC Franchise Commitment						Difference					
		19/20	20/21	21/22	22/23	23/24	24/25	19/20	20/21	21/22	22/23	23/24	24/25	19/20	20/21	21/22	22/23	23/24	24/25
NPO	Cross Country	90.0%	90.0%	90.1%	90.2%	90.3%	90.3%	91.0%	-	-	-	-	-	-1.0%	-	-	-	-	-
	C. Sleeper	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
nglia	Greater Anglia	89.0%	89.2%	89.2%	89.2%	89.2%	89.2%	92.5%	92.5%	92.7%	92.8%	92.9%	92.9%	-3.5%	-3.3%	-3.5%	-3.6%	-3.7%	-3.7%
	ARL	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	96.3%	96.3%	96.3%	96.3%	96.3%	96.3%	-1.6%	-1.6%	-1.6%	-1.6%	-1.6%	-1.6%
	C2C	95.5%	95.5%	95.7%	95.6%	95.6%	95.6%	97.2%	97.2%	97.2%	97.2%	97.2%	97.2%	-1.7%	-1.7%	-1.5%	-1.6%	-1.6%	-1.6%
	MTR Crossrail	94.0%	94.0%	94.0%	94.0%	94.0%	94.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%
	TfL Rail	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	-1.1%	-1.1%	-1.1%	-1.1%	-1.1%	-1.1%
NE&EM	Grand Central	83.5%	85.0%	85.0%	85.0%	85.0%	85.0%	-	-	-	-	-	-	-	-	-	-	-	-
	Hull Trains	84.5%	85.0%	85.0%	85.0%	85.0%	85.0%	-	-	-	-	-	-	-	-	-	-	-	-
	Northern	89.2%	89.4%	89.8%	90.5%	91.1%	91.1%	93.1%	93.3%	93.4%	93.5%	93.5%	93.5%	-3.9%	-3.9%	-3.6%	-3.0%	-2.4%	-2.4%
	EMT	91.1%	90.8%	91.0%	91.2%	91.3%	91.3%	-	-	-	-	-	-	-	-	-	-	-	-
	VTEC	82.5%	83.2%	84.4%	85.4%	85.6%	85.6%	87.8%	88.8%	89.6%	90.0%	90.0%	-	-5.3%	-5.6%	-5.2%	-4.6%	-4.4%	
NW	Chiltern	93.8%	93.9%	93.9%	94.2%	94.3%	-	94.3%	94.7%	95.0%	-	-	-	-0.5%	-0.8%	-1.1%	-	-	-
	Merseyrail	94.4%	94.4%	94.9%	95.4%	95.6%	-	94.4%	94.4%	94.9%	95.4%	95.6%	-	0.0%	0.0%	0.0%	0.0%	0.0%	-
	Virgin	86.4%	86.8%	86.5%	85.9%	86.1%	-	86.4%	86.8%	86.5%	85.9%	86.1%	-	0.0%	0.0%	0.0%	0.0%	0.0%	
	TPE	88.6%	88.7%	88.8%	88.9%	89.0%	-	91.1%	91.3%	91.5%	91.7%	91.7%	91.7%	-2.5%	-2.6%	-2.7%	-2.8%	-2.7%	-
	WMT	88.4%	88.8%	88.4%	88.7%	89.1%	-	90.0%	90.1%	90.3%	90.6%	90.7%	-	-1.6%	-1.3%	-1.9%	-1.9%	-1.6%	-
otland	ScotRail	91.5%	92.5%	92.5%	92.5%	-	-	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	-1.0%	0.0%	0.0%	0.0%		
outh East	GTR	82.1%	82.4%	82.7%	83.5%	84.3%	-	-	-	-	-	-	-	-	-	-	-	-	-
	SE Route	87.8%	87.2%	87.5%	88.0%	88.4%	88.4%	-	-	-	-	-	-	-	-	-	-	-	-
/ales	ATW/TfW	91.9%	91.9%	92.0%	92.1%	92.1%	92.1%	92.5%	92.7%	92.9%	93.1%	93.3%	93.3%	-0.6%	-0.8%	-0.9%	-1.0%	-1.2%	-1.2%
/essex	SWR	87.3%	87.6%	87.2%	87.4%	87.5%	87.5%	91.9%	92.1%	92.2%	92.4%	92.5%	92.6%	-4.6%	-4.5%	-5.0%	-5.0%	-5.0%	-5.1%
/estern	GWR	88.2%	88.5%	88.8%	89.0%	89.2%	89.2%	91.7%	-	-	-	-	-	-3.5%	-	-	-	-	-

ute	TOC	SBP Published Figure						TOC Franchise Commitment						Greatest Difference
		19/20	20/21	21/22	22/23	23/24	24/25	19/20	20/21	21/22	22/23	23/24	24/25	
PO	Cross Country	90.0%	90.0%	90.1%	90.2%	90.3%	90.3%	91.0%	-	-	-	-	-	-1.0%
	C. Sleeper	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	0.0%
glia	Greater Anglia	89.0%	89.2%	89.2%	89.2%	89.2%	89.2%	92.5%	92.5%	92.7%	92.8%	92.9%	92.9%	-3.7%
	ARL	94.7%	94.7%	94.7%	94.7%	94.7%	94.7%	96.3%	96.3%	96.3%	96.3%	96.3%	96.3%	-1.6%
	C2C	95.5%	95.5%	95.7%	95.6%	95.6%	95.6%	97.2%	97.2%	97.2%	97.2%	97.2%	97.2%	-1.6%
	MTR Crossrail	94.0%	94.0%	94.0%	94.0%	94.0%	94.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	-1.0%
	TfL Rail	93.9%	93.9%	93.9%	93.9%	93.9%	93.9%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	-1.1%
E&EM	Grand Central	83.5%	85.0%	85.0%	85.0%	85.0%	85.0%	-	-	-	-	-	-	-
	Hull Trains	84.5%	85.0%	85.0%	85.0%	85.0%	85.0%	-	-	-	-	-	-	-
	Northern	89.2%	89.4%	89.8%	90.5%	91.1%	91.1%	93.1%	93.3%	93.4%	93.5%	93.5%	93.5%	-3.9%
	EMT	91.1%	90.8%	91.0%	91.2%	91.3%	91.3%	-	-	-	-	-	-	-
	VTEC	82.5%	83.2%	84.4%	85.4%	85.6%	85.6%	87.8%	88.8%	89.6%	90.0%	90.0%	-	-5.6%
W	Chiltern	93.8%	93.9%	93.9%	94.2%	94.3%	-	94.3%	94.7%	95.0%	-	-	-	-1.1%
	Merseyrail	94.4%	94.4%	94.9%	95.4%	95.6%	-	94.4%	94.4%	94.9%	95.4%	95.6%	-	0.0%
	Virgin	86.4%	86.8%	86.5%	85.9%	86.1%	-	86.4%	86.8%	86.5%	85.9%	86.1%	-	0.0%
	TPE	88.6%	88.7%	88.8%	88.9%	89.0%	-	91.1%	91.3%	91.5%	91.7%	91.7%	91.7%	-2.8%
	WMT	88.4%	88.8%	88.4%	88.7%	89.1%	-	90.0%	90.1%	90.3%	90.6%	90.7%	-	-1.9%
tland	ScotRail	91.5%	92.5%	92.5%	92.5%	-	-	92.5%	92.5%	92.5%	92.5%	92.5%	92.5%	-1.0%
th East	GTR	82.1%	82.4%	82.7%	83.5%	84.3%	-	-	-	-	-	-	-	-
	SE Route	87.8%	87.2%	87.5%	88.0%	88.4%	88.4%	-	-	-	-	-	-	-
les	ATW/TfW	91.9%	91.9%	92.0%	92.1%	92.1%	92.1%	92.5%	92.7%	92.9%	93.1%	93.3%	93.3%	-1.2%
ssex	SWR	87.3%	87.6%	87.2%	87.4%	87.5%	87.5%	91.9%	92.1%	92.2%	92.4%	92.5%	92.6%	-5.1%
stern	GWR	88.2%	88.5%	88.8%	89.0%	89.2%	89.2%	91.7%	-	-	-	-	-	-3.5%
	Heathrow Express	70.0%	70.3%	70.6%	70.8%	71.0%	71.0%	-	-	-	-	-	-	-

Appendix 2

Notes from Meeting with Anglia Route (31 July 2018)

Attendees

Ian Hood (IH) and Andy Castledine (AC) representing Arup and John Thompson (JT) representing Network Rail Anglia route.

JT took the group through the draft slides for the ORR review on 10/8 as a way of demonstrating what NR believed had happened in the Anglia CP6 performance planning arena and how, in their view NR considered this to be the right thing to do. Group discussed specific issues both within and around the mandate

IH requested the updated performance model be made available for the purposes of transparency, it was hoped this would be made available for today. Network Rail will provide the model, including the latest iterations made to it.

JT stated latest work had focussed in the last couple of months on ensuring the response to the draft determination was accurate, and was measurable. This included consideration of all feedback to the Route Strategic Business Plan (RSP) and National Task Force (NTF) feedback.

There is expected change for the GA TOC trajectory as:

15. Growth has not materialised as much as expected;
16. Planned depot at Manningtree now no longer going ahead;
17. New rolling stock is being deployed; and
18. Additional services to be run with more competitive journey times (the network is already 'congested').

The C2C trajectory will improve by +0.6% PPM, based on agreement reached with C2C ops director on delivery.

The current MTR trajectory will remain unchanged for now but will be reviewed in the light of more detailed TRENO modelling.

ARL are judged to be able to meet their performance plan, and have agreed a trajectory and targets with Network Rail which reconcile PPM and their concession agreement which measures on 0-3.

Strategically Weather assumptions are unchanged from CP5, and there aren't any plans to make changes to incident recovery through CP6. Aligned to this is a descoping of the Digital Railway project on the C2C route, which has reduced the involvement of the Traffic Management system.

The performance impact of the sustainability proposals were, in Network Rail terms, at Grip 0 stage, and therefore are not specifically included an extra item in the models for this purpose. More progressively Network Rail expect change to come through a change in the SAF forecast.

The performance innovation fund is one fund of many industry innovation funds, and the performance trajectory / plans should examine all options not just this one.

Group discussed a potential further submission before the 31st August final response to the draft determination. I noted that change to performance in the weeks since the 13th July submission may mean that the route would propose change to the early CP6 trajectory with reference to the poor performance in 2018/19, and that for example the industry change in timetable planning may affect the GA trajectory

Group discussed whether the CrossCountry franchise should be included on the Anglia scorecard. JT suggested that if Network Rail included reference in the Anglia scorecard, the logical approach was to (simply) measure Right Time at the route boundary, but that if CrossCountry were to be included in the Anglia scorecard, we should consider the same approach for GTR and EMT which operate not dissimilar levels of service on Anglia route. A consequence of this may be a diluted scorecard.

Appendix H

Post-Route Meeting Technical Note

Technical Note

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Project title	Mandate L4AR004c: Assessment of Network Rail's Response to the Performance Challenges within the Draft Determination	**Job number**	263537-00
cc		**File reference**	
Prepared by	Various	**Date**	07 November 2018
Subject	Post-Route Meeting Early View		

H1 Background and Purpose

Arup, as the Independent Reporter, has been commissioned by Network Rail and ORR to deliver a review of Network Rail's response to comments made by the ORR and Reporter on its PR18 Route Strategic Plans published in February 2018. In particular, the review is based on consideration of the interim submission by Network Rail made on 13th July 2018 covering both operational performance and asset sustainability.

This Technical Note follows the one issued on 3rd August and provides an initial view of the findings of the study following the meetings with the routes.

H2 Process of Engagement with Network Rail

As part of this next stage of the review a series of meetings were held with Network Rail. These were arranged by ORR. The schedule of the meetings is attached as Appendix A to this Note.

Questions relevant to the review were circulated to the Network Rail participants beforehand. A copy of these questions is attached as Appendix B.

In response Network Rail, generally, circulated a presentation to respond to the questions the review team posed. The core purpose of the presentation was generally to answer the questions but they usually contained further information supporting their latest submission and describing the activities currently taking place ahead of the final submission scheduled for 31st August.

A summary of the nature of the documentation is shown below.

Route	Supplied Documentation
Anglia	Performance: Individual Strategic Performance Narratives, NTF pro-forma, and TOC sign off logs. Route Performance Plan Update, Responses to Specific ORR Questions, CP6 DD Performance Response, SBP Performance Evidence Pack Sign off for each of the five TOCs. Sustainability: Summary of CP6 additional works and Asset Sustainability document
South East	Performance: Performance response to the DD, and NTF pro-forma from each of the two TOCs Sustainability: Summary of CP6 additional works and Asset Sustainability document
Wessex	Performance: PPM Historic Trend for CP6 Forecast, Performance Evidence Pack, SBP Performance Evidence Pack Sign off Sheet, Appendix G PPM Historic Trend for CP6 Forecasts Sustainability: Summary of CP6 additional works and Asset Sustainability document
London North Eastern and East Midlands	Performance: Performance Template, CP6 RSP Performance Presentation, Individual NTF pro-forma for each of the five TOCs. Sustainability: Summary of CP6 additional works and Asset Sustainability document
Western	Performance: CP6 Assumptions, CP6 Revised Trajectory based on Assumptions, Joint CP6 Work Update, SBP Performance Template and NTF Pro Forma for each of two TOCs Sustainability: Summary of CP6 additional works and Asset Sustainability document
London North Western	Performance: Individual Joint Performance Strategies, NTF pro-forma, and SBP Performance Evidence Pack Sign off for each of the five TOCs. Sustainability: Summary of CP6 additional works and Asset Sustainability document
Wales	Performance: Route Strategic Plan, Performance Template, Performance Overview July 2018, CP6 Performance Trajectories, SBP Performance Evidence Pack Sign off, and NTF Pro Forma sign off. Sustainability: Summary of CP6 additional works and Asset Sustainability document

The core of the discussions with the Routes was to come to a view on:

1. The realism of the exit point to CP5 and whether this was agreed with the TOCs;
2. The realism of the trajectory of performance during CP6 and again whether agreed with TOCs;

3. Any model that had been used by the route to confirm it follows the assumptions made for the new submission; and
4. How sustainability has been dealt with, and in particular how additional investment has been considered.

H3 Engagement Outcomes

The following sections describe the outcomes of the above for each of the routes with whom the team met.

H3.1 Anglia Route

H3.1.1 CP5 Exit

Engagement Findings

Anglia are lead route for four TOCs, the route has forecast their exit position for CP5 and are summarised below in terms of what was submitted within their SBP and the revised current projections.

TOC	SBP CP5 Exit PPM	CP5 Exit PPM	Comment
Arriva Rail London (ARL)	95.2%	95.3%	Variations to the TOC forecasts to the end of CP5 are based on the extreme weather experienced, some re-profiling has been undertaken and is reflected in the revised CP5 exit values.
C2C	95.6%	95.8%	
Greater Anglia (GA)	89.6%	89.5%	
MTR Crossrail (MTRC)	94.4%	94.3%	

Recent performance issues have impacted on the CP5 exit, with emphasis being given to the hot and cold weather extremes experienced over the past year. Anglia are unable to confirm if further amendments will need to be made to the CP5 exit positions. Also benefits from the fleet replacement programmes let by MTRC and C2C have not met expectations.

Since the original submission in February 2018, Anglia anticipate that they will undertake a re-profiling exercise in year one of CP6 as extreme weather impacts had not been considered previously. Anglia is currently investigating the effect of these weather extremes on route assets and how in conjunction with the TOCs they can improve the rate of recovery for the route.

Based on the review of the 13th July submission documentation and the meeting discussion, there is reasonable evidence indicating that Anglia have engaged with its four TOCs. A document summarising recent TOC engagement along with a summary of actions has been provided as evidence of the ongoing dialogue by the route.

Arup View

The presentation and documents previously provided, confirm that Anglia have been open in relation to their ongoing revisions of the CP5 exit positions, with recent changes focussed upon the effects of the hot summer weather.

Conclusion

We have low confidence in the route achieving the CP5 exit point.

H3.1.2 CP6 Trajectory

Engagement Findings

Anglia have agreed proposed CP6 trajectories with both ARL and C2C. Key improvements for ARL include line electrification, fleet replacement and enhanced service frequency. Whilst C2C have less opportunity to make structured change such as timetables, focussing on asset reliability drives across the whole route, new rolling stock and introducing enhanced automated regulation and service management decision support tools.

MTRC

MTRC have agreed to the performance plan but not the associated trajectory.

Anglia are working collaboratively with both MTRC and Western route to develop and deliver the new Elizabeth Line in terms of both development and agreement of the service specifications. Meeting discussions indicated that the route continue to have reservations and uncertainties relating to the impact and opportunities offered by the new Elizabeth Line and that large risks are associated particularly with the integration of services by several TOCs in conjunction with the MTRC high frequency service plans remain.

Ongoing discussions between Anglia and MTRC continue in relation to the provision of new infrastructure, depot access and operational processes. Difference remain between the signalling of the new Line and the historic Route network, and understanding of the operational capability of these is ongoing.

MTRC are also committed to full fleet replacement during CP6.

GA

GA have not signed off on their trajectory due to franchise commitments however they have agreed to the Strategic Plan. GA aim to increase passenger numbers through a mix of more services and service improvements. To prepare the route, significant network preparatory works are required, including works at some level crossings to allow increased line capacity and changes to operational practices for example, selective door opening to allow for longer train sets.

Anglia and GA are currently reconsidering the benefits offered by new rolling stock in conjunction with associated timetable changes.

Arup View

A focus to the discussions has been the risk to performance from increased passenger growth. This risk is compounded by the commercial pressures of the TOCs to utilise network maximum possible network capacity through improving journey times within the timetable changes, which generate risk by reducing the availability of performance resilience. However, it is clear that timetable changes will need to be undertaken throughout CP6. Anglia have accepted that they will model the timetable changes for the overall Cambridge box due to the clash between TOCs operating metro and long-distance services.

A key risk to the delivery is the increase in reactionary delays to Anglia and Western that may occur if Central Operation Section is poorly managed. It is not clear that a joined-up approach has been adopted with the Western route.

To aid transparency of TOC engagement, the route has been asked to detail MTR and GA discussions, specifically expanding upon the reasons why differences in opinion remain. These notes have not been received but are expected to highlight TOC optimism against route realism.

Conclusion

We have some confidence in the outcome of the trajectories.

H3.1.3 Performance Model

Engagement Findings

Anglia have developed a bottom up model which is based on historical performance in conjunction with informed assumptions associated with future initiatives. Following the previous Anglia model review, amendments have been made to check the performance trajectories. These amendments were to provide a model in a more auditable format with a revised methodology to allow PPM failure changes to either be on-off in year impacts, or to accrue cumulatively.

The provided model was highly simplified, presenting the trajectory output worksheets for each of the lead TOCs. Risks and opportunities are classified by impact type either one-off or cumulative. However, the model utilised the 2017/18 PPM% value derived for the TOC.

Arup View

The adopted approach to calculate the cumulative effects from the previous year is overly simple, as the cumulative effects are not being applied proportionally onto the network through the increase in train counts. This is leading to an overly optimistic outcome, particularly for MRTC and ARL.

Conclusion

We have a low level of confidence in the modelling due to the assessment of cumulative effects year on year, with new train counts not being exposed to the PPM failures present in the route.

H3.1.4 Sustainability

Engagement Findings

It was confirmed by the route that no detailed work has been undertaken regarding the translation of the additional investment into performance benefits. It was considered by the route that this financial contribution to manage the degradation of assets was anticipated to yield minimal benefit over the control period with the scale of benefits lost at a strategic level.

However, the sustainability submission has included a list of schemes with half of them noted as having a 'significant' benefit in performance terms.

Arup View

It is disappointing that the anticipation of significant benefits from the schemes included in the activities identified for additional spend have not been quantified and included in the trajectory.

Conclusion

No account has been taken and therefore it is not possible to provide a view

H3.2 South East Route

H3.2.1 CP5 Exit

Engagement Findings

Based on the review of the submission documentation, the presentation and the meeting discussion there is strong evidence that the route has engaged with its two TOCs (Southeastern and GTR). This is principally evidenced in the presentation pack with dates and outcome notes. There is an acknowledgement (notes of meeting of 21/06/18 attended by the route and both TOCs) that there was broad agreement that the performance levels are below forecast due to the significant events which had taken place. This led to a review of the earlier CP5 exit position by the route. The route states that the CP5 exit position will be worsened not merely by the move to P50 confidence levels (form P80) but also to reflect the significant event impact. The following table shows the latest view of the CP5 exit position.

TOC	Original P80	Revised P50	Current P50	Comments
GTR	81.9%	83.1%	80.9%	Variations to both TOC forecasts to the end of CP5 are based on the severe weather effects, and the re-phasing of the introduction of the Thameslink timetable.
Southeastern	89.5%	90.1%	88.3%	

In reviewing the current position with regards to performance and how this could develop throughout the rest of 18/19 the following is noted:

Southeastern

Severe Weather – the impact is considered by the route to be greater than the average but within the expected range of variation and thus it appears that no special provision has been made in the forecasting to CP5 exit.

Fleet – the impact on fleet performance is considered by the route to be transient and recoverable during the rest of the year.

Asset Failures - whilst acknowledged as significant it is stated that these are likely to be recoverable through planned initiatives.

Fatalities and Trespass – this is considered to be a growing problem with impacts greater than over the past three years.

GTR

Fleet – the bedding in of the class 700 series vehicles will deliver greater stability to the fleet performance.

Timetable – this is not in a stable position and as such there is residual risk associated with its delivery

Fatalities and Trespass – similar impact to Southeastern with increasing impacts.

Arup View

The route has a sophisticated model for determining future performance levels (see section 3.2.3). They have undertaken a detailed engagement with the two TOCs and considered several relevant factors that will potentially impact on performance over the next seven months.

However, the view taken of the treatment of severe weather is considered to be high risk and simplistic – we need to ensure previous events are now regarded as normal. The route's approach does not give us confidence the risk is being appropriately managed.

Regarding trespass and fatalities, it is not clear that the route has adequate mitigation measuring in place to improve the situation, noting that the biggest events have been TOC generated e.g. through passenger self-evacuation from stranded trains.

Our assessment of the CP5 exit figures is that they are the product of a reasonable approach but has limitations as described. It is noted that the TOCs have both not agreed to the revised figures.

Conclusion

Based on the review of the submission we have some confidence that the CP5 exit figures are achievable for both TOCs.

H3.2.2 CP6 Trajectory

Engagement Findings

The key changes to the CP6 trajectory are around the conversion of the figures to P50 confidence from P80. This has boosted the CP6 exit levels of PPM by roundly 2.0% for both TOCs.

As noted above the quantification of the impacts of the individual factors affecting the trajectory have been determined using the route's performance model. Thus, the following commentary considers the route's approach to the determination of the factors affecting the change whilst section 3.2.3 considers the modelling outcomes.

The route has also included the impacts of Digital Railway and stripping these out resulted in a worsenment of 1.2% and 0.8% in the CP6 exit trajectories for GTR and Southeastern respectively.

The approach adopted by the route to deliver the revised trajectories has been agreed with both GTR and Southeastern however the resulting outcomes have not.

The impacts of the various factors affecting PPM performance over the course of CP6 are shown in the following table:

TOC	Performance Affecting Factor	Impact	Comment
GTR	Thameslink Timetable Re-phasing	-0.3%	Whilst the original impact of the timetable introduction had been neutral the experience with the May 2018 timetable change has brought about a risk to performance through the further timetable iterations to reach the stabilised Thameslink timetable
	Fatalities and Trespass	-0.2%	This is reflective of the worsenment of the baseline position of this area as discussed in section 3.2.1
	TOC Improvements	-0.6%	This takes account of the TOC planned reduction in their improvement plans and the route adopting a cautious view on the impact of a franchise change during CP6
Southeastern	Thameslink Timetable Re-phasing	-0.1%	This takes account of the increased interaction between this TOC and Thameslink services but has been modified to take account of the re-phasing
	Current Performance and Fatalities and Trespass	-0.3%	The figure takes account of the worsenment of performance and the position with fatalities and trespass which is quoted as being "no longer recoverable"
	TOC Improvements	-0.3%	This is reflective of the current lack of delivery of benefits in the plan and the change of franchise in the first year of CP6 meaning that there is a difficulty in forecasting future plans

Given the cross-route nature of the Thameslink services the route was specifically asked about their engagement with LNE&EM Route regarding the potential 'contamination' of performance on both sides of the boundary on these services. It

was stated that the assumption had been made that this would have a neutral effect on performance.

Arup View

The biggest changes to the CP6 trajectory is associated with the impact of the removal of the Digital Railway impacts and the conversation of their submission from P80 to P50. Apart from that the changes to the trajectories in CP6 appear to be modest with the route seeming to have adopted a conservative approach to the benefits and optimistic view of worsenments leading to a neutral impact. The optimistic view of potential worsenments is typified by the assumption that the cross-boundary services would have a neutral impact on performance.

The impact of the Thameslink timetable changes is noted to have an effect but their impact seems modest and given recent experience that may be an optimistic view particularly given the fact that the current Thameslink timetable is not being delivered. Similarly changes to both franchises are recognised as having an effect but this is modest and this could be a risk if franchise requirements were very different to the current agreements. In addition, the statements made regarding the impact of trespass and fatalities appear to represent a threat to future delivery ("no longer recoverable") but have only modest impacts on performance attached to them.

The previous review found the model used by the route to be probably the most sophisticated of those encountered during that review. There is strong evidence to support the route assertion that there has been engagement with the TOC over the revisions and this has undoubtedly fed into the model. However, the quantum of the resulting impacts appears low.

Conclusion

We have confidence in the approach that has been taken to assess and quantify the changes that have been made to the trajectory. In terms of the output trajectories we have reasonable confidence in the profile in net terms.

H3.2.3 Performance Model

Engagement Findings

The SE model is a well-structured model that is associated with many assumptions. The SBP CP6 trajectories were based on a P80 level of confidence which the South East were asked to revise to reflect the P50 level of confidence assumed by each of the other routes. In addition, changes have been made to input data as well as some of the considered assumptions for example 'Digital Railway' has now been removed from the model due to the level of uncertainty associated with the emerging technology. Other changes have included the phasing of Southeastern trains to tally with the GTR timetable.

Arup View

The developed model is complex and requires a high level of knowledge to ensure meaningful outputs are generated. Consideration of altering an input, such as

extreme weather impacts (average historic trends have been utilised regarding extreme weather events in recent years as one-off occurrences), is more complicated than within some of the simpler models developed for other routes, which in turn means that unless specific direction is given SE Route appear uninterested in testing the change.

This contributes to the perception that the developed model is inflexible and reasoning is used to detail the exclusion of new risks for example the unresolved GTR industrial action. The SE model excluded any associated risks as GTR are confident that future action will not have any impact on the operation of their services consequently they agreed with this assumption. Resulting in the perception that the route should be more challenging towards their TOCs.

Conclusion

High level of confidence in route meeting the CP6 trajectories however, the route should critically review all assumptions and inputs into the model to ensure minimal risk to their own performance.

H3.2.4 Sustainability

Engagement Findings

The route stated in the meeting that they believed that there would be little to no impact on performance from the additional renewal investment and that the focus was mainly on asset sustainability. However, the route said that they had undertaken an assessment of the impact for track thus far. As of this was at odds with their submission which included an evaluation of the performance impacts in terms of reductions in SAFs both in CP6 and CP7 because of the work. The impact from the structures interventions were also linked to the avoidance of disruption costs.

Arup View

The route's view was very much that the focus of the extra investment was on asset sustainability and that whilst it appeared that an impact assessment had been undertaken this did not feature in the trajectories.

Conclusion

It is not possible to come to a view on the sustainability submission since it has not featured in the performance outputs.

H3.3 London North Eastern and East Midlands Routes

H3.3.1 CP5 Exit

Engagement Findings

For the five TOCs for which LNE&EM is the lead Route the Network Rail position for their forecast exit position for CP5 is:

TOC	CP5 Exit PPM
East Midland Trains (EMT)	91.7%
Grand Central (GC)	85.4%
Hull Trains (HT)	82.3%
London North Eastern Railway (LNER)	83.8%
Northern Railway (NoR)	89.0%

It was clear for the dialogue at the meeting that there was an acknowledgment of significantly poor performance since the original submission in February 2018 which had impacted on the route's view of the CP5 exit position. Quoted as being of particular note were the extreme weather conditions and the impact of the May 2018 timetable change.

Analysis was presented to show the causes of performance worsenment for the three franchised TOCs over the previous 13 periods.

TOC	P4 17/18	P3 18/19	Comment
EMT	92.2%	91.0%	The three biggest causes of degradation were: TOC on TOC*; Network Management; and Stations. Noting that there had been an improvement in Severe Weather impact over the 13 periods
LNER	84.0%	77.3%	The three biggest causes of degradation were: TOC on TOC*; Fleet; and Network Management
NoR	90.7%	84.7%	The three biggest causes of degradation were: Operations; Traincrew; and Network Management

* The route stated that GTR was the biggest cause of TOC on TOC delays

There is strong evidence to suggest that the route has been in dialogue with all five TOCs with a view to trying to reach agreement on the CP5 exit position. The position with EMT, GC and NoR is noted as being particularly influenced by the recent poor performance and the need to reach agreement on the impact of that on the exit level. The route stated that their efforts to reach agreement on the CP5 exit level were closest with EMT, furthest away with NoR, with LNER in the middle.

Arup View

Based on the presentation and the documentation previously reviewed there is strong evidence of a systematic approach to the determination of new exit figures. This has included engagement with the respective TOCs and an acknowledgement of the current performance issues. However, the transition between the levels of performance today and those particularly of LNER and Northern means that achievement of the forecast levels will be challenging particularly with, the fleet legacy from the severe weather, the onset of leaf fall season, followed by winter. Nevertheless, the forecast performance levels for the three franchised TOCs takes them back to the level of a year ago. The question is therefore whether the rail landscape has changed to make that now difficult to achieve. However, it was noted that LNER intend to take services out which should improve the robustness of their resource plans.

Conclusion

Based on the foregoing we have a reasonable degree of confidence in the achievement of the CP5 exit levels for EMT. We have some confidence in the achievement of the forecast for LNER and NoR.

H3.3.2 CP6 Trajectory

Engagement Findings

The route has developed their forecast trajectories through CP6 based on a bottom up approach for each TOC. As noted above there is good evidence of engagement with the respective TOCs in the process to determine the elements of the profile and their quantum. However, it was stated that since dialogue with the TOCs is still ongoing the trajectories may yet change. The following table summarises the respective PPM trajectories at present.

TOC	CP6 Entry	CP6 Exit	Change	Comment
EMT	91.7%	91.3%	-0.4%	Whilst there is forecast to be some improvements from fleet throughout the control period (+0.16%) this is outweighed by negative impacts from the Thameslink timetable (-0.55%) and greater TOC on TOC impacts from new timetables (-0.30%).
GC	85.4%	85.01%	-0.39%	This is like EMT with modest fleet improvements of 0.06% outweighed by traffic growth impacts of -0.54%.
HT	82.3%	85%	+2.7%	There are a lot of small positive elements to the trajectory including better timetabling from GPS (+1.0%), improved track (+0.5%) and improved fleet (+0.46%). Traffic growth impacts are also factored in but they have a lesser effect than on other TOCs at 0.39%.
LNER	83.8%	85.6%	+1.8%	The biggest improvement (+1.25%) to the performance is quoted through the introduction of the IEP fleet in 19/20. A further +0.25% each come from reduced external impacts, and service recovery and handover plans. Negative impacts on performance are forecast to come from traffic growth on Thameslink and ECML (combined to 0.66%).
NoR	89.0%	91.1%	+2.1%	Twelve contributing factors have been identified of which the one with the greatest impact is Improved Fleet in 18/19 (+1.2%). This is driven by the cascade of rolling stock and the removal of older pacer units. Benefits from local action to improve traincrew and station staff actions yields a further +0.4%. A further 0.4% comes from the combination of actions regarding recovery and handover plans throughout CP6, and driver controlled operation in 19/20. The remainder provide 0.1% or less impacts either positively or negatively.

The trajectory for CP6 was stated by the route as having been built up from an assessment of the impacting factors and their evaluation. We requested a copy of the build-up of the assessments of the impact of the individual elements creating the profile but this has not yet been made available. However, in discussion it was stated that the route assessment has taken account of the impacts of weather related infrastructure failures particularly those associated with earthworks. No account was taken of the adverse effects of the weather on the fleets. An assessment has been included of the impact of the timetable change in the trajectory.

It was noted that their assessment of the impact of reactionary delays was that they were getting worse and this was reflected in the profiles. GTR was stated as being the biggest cause of reactionary delays.

The route has liaised with South East and LNW routes to understand the risks from cross-border traffics. The impact of this has been included in the assessment the route has done to create the trajectories.

It was stated that no assumptions for any benefits from the Digital Railway had been included in the trajectory.

Arup View

There is evidence that the approach taken by LNE&EM is different to that used elsewhere where models of varying sophistication have been used to drive the outcomes. Instead their use of the bottom up approach of evaluating the individual impacts is different and may be more appropriate to the nature of the route and its TOCs. We have not been able, yet, to review the detail behind the trajectory assessments and thus cannot comment on that now.

Nevertheless, the evidence of engagement with the TOCs and the structured approach to the process is considered positive. There is concern however over the treatment of the new IEP fleet in the sense of assuming a benefit from early in the control period without taking account of any 'bathtub' impacts. Also, by their own admission, they have been optimistic over a reduction in reactionary delays although the means of achieving this was not obvious from the engagement with their team.

It was also not clear how the cross-border impacts had been considered in the profiles leading to some concern over how these have been treated.

Conclusion

Based on the foregoing and until we receive further evidence of the process to assessment of the quantum of the benefits we have some confidence in the trajectories as presented.

H3.3.3 Performance Model

Engagement Findings

LNE&EM adopted a bottom up, quantitative approach to forecasting. The trajectories remain unchanged from the SBP. This was confirmed during recent

discussions with the Route that no change has been made to the input assumptions. The TOCs have been engaged throughout the process although none of the lead TOCs for this Route have signed off on the CP6 trajectories. We are awaiting further information to clarify where the differences in views lie between LNE&EM and the TOCs.

Arup View

Discussions indicated that LNE&EM have a thorough appreciation of the challenges and opportunities that apply to their Route. Concern was clearly articulated in relation to reaction delay to timetable changes can be improved, which is reflected within their modelling for example they have allowed for risk associated with adverse weather on infrastructure performance however, no allowance has been for TOC related weather impacts. This route has a history of suffering from severe weather conditions and thus such an omission reduces our confidence in the trajectory.

Conclusion

We have reasonable confidence in the methodology adopted which is supported by well-informed inputs and regular dialogue with their lead TOCs.

H3.3.4 Sustainability

Engagement Findings

The route stated in the meeting that they had not included any impacts of the additional sustainability investment in their trajectory assessment. This aligned with their 13th July submission which included performance enhancing items in the supplementary programme. The focus on the core programme of delivering improvements in sustainability. It was stated that due to time constraints no performance impact assessment had been undertaken.

It was also stated that the investment had not been confirmed and thus any inclusion of benefits in the trajectory would import delivery risk.

Arup View

The route's view was very much that the focus of the extra investment was on asset sustainability and that whilst some qualitative assessment had been done on the impacts on performance this was not the driver of the schemes.

Conclusion

It is not possible to come to a view on the sustainability submission since it has not featured in the performance outputs.

H3.4 Wessex Route

H3.4.1 CP5 Exit

Engagement Findings

For South Western Railway for which Wessex are lead route the Network Rail position for their forecast exit position for CP5 is: 86.5% PPM MAA based on the 2018/19 plan circulated in the National Task Force, against a TOC franchise requirement of 91.61% PPM MAA. A gap of circa 5%. This is a significant variance.

The route considers the CP5 year 5 values as:

19. Floor: 82.7%;
20. Forecast 86.5%; and
21. Upper 89%.

Performance has declined through CP5; PPM for SWR has seen a decline over the past seven years of 0.7% per annum:

22. 0.3% of this decline can be attributed to passenger growth the remaining; and
23. 0.4% is attributable to several categories including an increase in sub-threshold delay.

The Grand Southern Railway (Alliance Rail Open Access) proposals to run services between Southampton and Waterloo were declined by the Regulator during the review period. This removes services from the train plan, and therefore increases theoretical network capacity, and potential performance.

Arup View

The modelling of the data inputs is credible, noting for example the route expects several significant performance incidents annually. The gap between Wessex and SWR will not be closed.

Conclusion

The analysis through CP5 is detailed, and the route was confident in their submission. We therefore have a high level of confidence in the route's ability to achieve the forecast CP5 exit level of performance.

H3.4.2 CP6 Trajectory

Engagement Findings

The overall picture is one of performance decline, but the modelling of the data, inputs and assumptions are credible. During the meeting, under questioning from Arup regarding the credibility of including TOC initiatives in the CP6 trajectory, the route indicated they will withdraw the new rolling stock and traincrew initiatives from their model citing lack of confidence in the TOC to deliver.

Whilst there is broad agreement between TOC and route, and there is evidence of collaboration on the CP6 trajectories, there are points of disagreement – stemming from the TOC Franchise Agreement performance targets and the reality the route believes is credibly possible.

The route state a series of performance initiatives will be taking place over CP6 to mitigate any further performance decline in these categories over CP6.

The CP6 forecast performance is around the 87% PPM per annum figure. This is adrift of the franchise target for SWR which shows a steady increase to 92.5% PPM at the end of CP6.

The biggest contributing factors to performance stasis on the route are external / severe weather autumn and structures / track – all of which are within the control of the route.

FNPO are engaged with the route and for the CrossCountry franchise have agreed 30% target for 'right time' arrivals at Reading, on the Western route – the boundary is at Southcote Junction on the Wessex Route.

Arup View

It is not credible to believe that when the franchise was let in 2017, the route was not involved in the timetable preparation and ensuing performance targets. It is considered that the route cannot claim ignorance of the franchise targets and then present a picture of decline when faced by an operator which claims it has initiatives to meet them.

Notwithstanding that statement, the approach taken by the route to promulgate the CP6 trajectory is pragmatic, realistic and evidence based using rigorous analysis, including statistical modelling and various forms of regression analysis. The route state a series of performance initiatives will be taking place over CP6 to mitigate any further performance decline in these categories over CP6. However, performance will remain largely static

Although Digital Railway Programme is unfunded within the route, we believe the devolved routes should be engaging the with Programme and planning to trial and roll out the new technology available. For example, Traffic Management coupled with Stock and Crew management will improve service recovery, and minor perturbations for modest capital cost without touching the signalling assets, which can migrate later. A successful deployment of Traffic Management and the decision support suite of tools within the Control office may well arrest some of the predicted decline.

We believe the data presented is credible and the route will meet the targets it set, however there will always be a disagreement with the franchisee, until the franchisee's targets are reset to a more realistic level, or the route finds other sources of funding to close the performance gap.

Conclusion

Based on the foregoing we have a high level of confidence of the trajectory.

H3.4.3 Performance Model

Engagement Findings

The CP6 PPM forecasting model was based upon identifying the long-term trends in PPM.

Extreme weather was not included as an identified risk within the CP6 trajectory as it was incorporated as part of the baseline forward trajectory as an underlying trend. Similarly, large incidents were retained within the baseline information.

A copy of the updated model has been reviewed, clarification has been requested in relation to some input values as there appear to be some inaccuracies within the model received.

Arup View

The model is well-structured but does not appear to be finalised consequently further analysis is anticipated. Given the assumptions presented, the CP6 trajectory figure is likely to increase. For example, benefits associated with fleet improvements have not been incorporated and reflected within the CP6 trajectory.

Conclusion

We have high level of confidence that the submission outcome will be achieved particularly as the CP6 trajectory does not currently contain all the TOC CP6 initiatives.

H3.4.4 Sustainability

Engagement Findings

The route confirmed that it had not factored any of the additional spend available for sustainable schemes in their performance trajectories.

Arup View

Whilst the lack of inclusion in the performance trajectories is disappointing the route's view that the investment levels were not yet confirmed accorded with other meeting outcomes.

Conclusion

It is not possible to come to a view on the sustainability submission since it has not featured in the performance outputs.

H3.5 Western Route

H3.5.1 CP5 Exit

Engagement Findings

For the Western route, for which Great Western is the lead operator, the Network Rail position for their forecast exit position for CP5 is: 87.6% PPM MAA based on the 2018/19 plan circulated in the National Task Force, against a TOC franchise requirement of 91.71% PPM MAA. A gap of 4.1%. This is a significant variance however the TOC agrees with the route position.

Current modelling suggests a year end PPM MAA of 85.1% with a maximum of 86% should all period targets be delivered.

There are residual risks at the close of CP5 regarding

24. GWR new fleet deployment;

25. Network Rail major projects around Oxford; and

26. GWR traincrew.

Arup View

The modelling of the data inputs is credible, however the performance model in operation by the route is the First Group Bid Team model, which may provide unintended optimism bias.

Conclusion

There was a stated change in the confidence in the performance model outputs, from 50% to 80% during our meeting with the route, therefore this means that the route is as likely to meet its target as not; this is a concern.

H3.5.2 CP6 Trajectory

Engagement Findings

GWR and HEx have agreed the start point for CP6. GWR aspire to 90.6%, which is within the range of the route trajectory, but does not align directly. Whilst both GWR and the route agree the trajectory it places a burden on both route and operator to deliver a higher target in a shorter period to meet the CP6 exit.

Arup View

The route had met with GWR on 22 June. It was identified that changes would be introduced later than previously expected resulting in the re-profiling of the trajectory. This includes such things as the TOC and unions agreeing to include Sundays in the working week. Other risks have also been identified such as Wales electrification.

During our meeting we stated we did not have confidence in the traincrew delivering performance improvements – as the scoped changes were not now

being delivered as intended, nor when intended. The new fleet was also recording higher failures than were anticipated. The potential substitute options (HSTs) will not be available through CP6 as they will be withdrawn. There is a risk that CaSL figures will increase, promulgated by fleet failure. Employee culture change programmes improving stated operational performance attracted a degree of scepticism.

The Luminate Traffic Management System integrated in the IECC scalable upgrade operating on the Great Western Mainline should deliver performance improvements via improved service recovery and operating decisions in the interest of PPM. However, it was not included in any performance trajectories as it one-year trial. This is short sighted. The TOC is not capitalising on the traffic management available by converting any of the in-cab Driver Advisory Systems to receive traffic management data. Therefore, the effects will be limited. Our view is traffic management will provide more efficacy when TOC and route systems are integrated. Benefits of Digital Railway can be realised without conversion of the lineside infrastructure to ETCS.

The stated change in the confidence in the performance model outputs, from 50% to 80% during our meeting with the route, after detailed questioning undermined their own belief in their work.

Conclusion

We believe that there remain too many variables in the trajectory and thus we have only reasonable confidence of the outcomes.

H3.5.3 Performance Model

Engagement Findings

Both TOCs have accepted the CP5 exit figure however, they have not reached agreement in relation to the CP6 trajectories.

The Western model is based on a bottom up plan and is based on the Route's Business Plan. Applied to the base model are a range of assumptions with ongoing improvements in the Route area such as Crossrail and HS2 as well TOC related initiatives such as fleet improvements.

Since the 13th July submission, further discussions have been held between GWR and the route to address several assumptions relating project timing, anticipated start dates and timescales to revise the CP6 trajectory. This appears to be representative of TOC engagement, that route has adopted an iterative process to determine performance related opportunities and risks. Discussions indicated that Western have relied on the GWR bid model to derive its CP6 trajectory, which we consider to be optimistic. Evidence that Western had challenged the initiatives would have been desirable, for example the fleet and traincrew assumptions by GWR are optimistic.

Western are to provide Arup with details of the difference of opinion that remain between HEX and GWR with the route trajectories.

Arup View

Western Route are trusting of the TOC model and may have been too accepting of the associated opportunities and timescales. The meeting suggested that the route has not challenged the TOC inputs to their model sufficiently. An awareness of possible issues with the model are reflected in the opportunity offered by a change in staff, will allow a new route team member to review their model. Consequently, further changes to the CP6 trajectory are expected beyond the assumption revisions currently being discussed with GWR.

Conclusion

Based on the above we have low confidence in the submission outcome.

H3.5.4 Sustainability

Engagement Findings

The route confirmed that it had not factored any of the additional spend available for sustainable schemes in their performance trajectories.

Arup View

Whilst the lack of inclusion in the performance trajectories is disappointing the route's view that the Investment levels were not yet confirmed accorded with other meeting outcomes.

Conclusion

It is not possible to come to a view on the sustainability submission since it has not featured in the performance outputs.

H3.6 London North Western

H3.6.1 CP5 Exit

The route submitted three sets of documents for each of the five TOCs for which they are lead. These documents were:

27. CP6 Joint Performance Strategy;

28. NTF Pro-forma; and

29. Performance Pack Sign-Off Evidence.

These form the core of the submission with no over-arching route summary.

The CP5 exit values quoted in the individual Joint Performance Strategies has been taken as the route's view of performance at that time. These are shown below:

TOC	Forecast CP5 Exit PPM
Chiltern Railways	93.8%
Merseyrail	95.1%
TransPennine Express	89.0%
Virgin West Coast	87.0%
West Midland Trains	88.8%

Within the performance strategy documentation there is no justification or assessment of the glide path between today's performance figures and the value of the entry level for CP6 in each case.

There is strong evidence of the route working with the TOCs to discuss future performance in the shape of the Strategy documents but it is clear from the Sign-Off Evidence that only Merseyrail has signed off on the trajectory and Virgin West Coast has signed off on an 'alternative trajectory'. Despite comments in the meeting presentation these are the only two TOCs which appear to have signed-off performance strategies.

There is an acknowledgement that since May 2018 there has been a rapid deterioration in the performance of TPE and Northern driven by a significant increase in TOC on TOC impact to TPE. It is noted that once the emergency timetable has been withdrawn the route are unclear regarding where performance will emerge. Noted that ongoing discussions are taking place with the TOCs to try to resolve these issues through joint plans.

It was noted that the current VWC PPM was quoted by the route as 82% meaning that there would need to be a significant improvement in performance to hit the exit forecast.

Arup View

There was an acknowledgement by the route that performance had deteriorated recently but their responses to questioning on how this was to be recovered through the significant number of initiatives they alluded to during the meeting gave little confidence that a measured and well considered response to the figures was in place.

We considered that there had been good engagement with the TOCs but that the franchise performance commitments of the TOCs made it impossible for them to sign up to the CP6 entry, and the overall trajectory. We therefore do not believe that sufficient evidence was presented to justify the CP6 entry level for all TOCs.

Conclusion

Based on the evidence provided we have low confidence in the achievement of the CP6 entry levels for all the TOCs.

H3.6.2 CP6 Trajectory

Engagement Findings

As noted above the route has prepared individual Performance Strategy documents which have been developed jointly with the TOCs. Except for Merseyrail none of these strategies, and the trajectory figures contained in them, have been signed off.

In each of these documents there is good evidence of engagement with the individual TOCs with each containing an engagement log with dates and outcomes in terms of the decisions made, any unresolved constraints and whether this has led to a change in the trajectory.

The determination of the individual initiatives to form the trajectory have been built up from an assessment of the risks and opportunities that the TOC faces. These are then translated into impacts on the profile of the trajectory in three categories of risk, opportunity and enablers. It is considered that the structure of the determination of the factors affecting performance is good.

The strategies each contain fishbone and waterfall diagrams showing the trajectories from CP5 to CP6 exit.

The table below provides comparison between the profiles and franchise commitments where available.

TOC		19/20	20/21	21/22	22/23	23/24
Chiltern	Trajectory	93.8%	93.9%	93.9%	94.2%	94.3%
	Franchise	94.3%	94.7%	95.0%	franchise renewal	
Merseyrail	Trajectory	94.4%	94.4%	94.9%	95.4%	95.6%
	Franchise	TBC	TBC	TBC	TBC	TBC
TransPennine	Trajectory	88.6%	88.7%	88.8%	88.9%	89.0%
	Franchise	91.1%	91.3%	91.5%	91.7%	91.7%
Virgin West Coast	Trajectory	86.4%	86.6%	86.5%	85.9%	86.1%
	Franchise	WCP	WCP	WCP	WCP	WCP
West Midlands Trains	Trajectory	88.4%	88.8%	88.4%	88.7%	89.1%
	Franchise	90.0%	90.1%	90.3%	90.6%	90.7%

The following sub-sections consider the trajectory documentation and confidence for each of the five TOCs

Chiltern Railways

The factors which have been identified as coming into play during CP6 have both a positive and negative effect resulting in a net betterment of the 0.5% in PPM. The principle factors are:

Factor	Impact	Comment
Fleet Reliability – Project 66	+0.3%	Little detail provided to support this but clearly a TOC driven initiative
Optimised timetable	+0.2%	Based on improved right time resilience, reduced regulation and a review of the fitness of purpose of the timetable
External	+0.3%	This is made up of three components associated with the autumn strategy, route crime and weather resilience each contributing a third of the benefits
Network Rail Operations	+0.3%	Based on better data systems and greater alignment of objectives with the operator
New Enhancements	+0.2%	Designed to provide greater resilience during periods of disruption
Passenger Growth	-0.1%	Caused by higher reactionary delays from lost right time resilience
Network Rail Assets	-0.3%	Impact of aging assets
Fleet Reliability	-0.3%	Increased number of incidents increasing delay
TOC Operations and Control	-0.2%	Impact of more incidents and increased delays
Project Works	-0.1%	Risk on increased mishaps and overruns

The quantification of the impacts is based on a review of the historic performance trends.

With reference to Chiltern Railway there is well documented evidence of the engagement with the TOC in the formulation of the trajectories delivered through a well-developed meeting structure.

Merseyrail

It is noted that the TOC has signed off the trajectory that has been jointly produced. As with Chiltern the Route is forecasting a betterment of 0.5% in PPM over CP6.

The principle factors are:

Factor	Impact	Comment
Network Rail Operations	+0.35%	This is derived from a combination of benefits from better systems and data, a focus on right time performance, and better route alignment with TOC objectives
Optimised timetable	+0.3%	From better timetable modelling and a joint approach to planning
External	+0.25%	Delivered through a 'whole industry' approach to the autumn dip, route crime and weather resilience
Network Rail Assets (net)	+0.1%	Benefits from the initiative to predict and prevent faults through better maintenance are partially negated by the on-going unreliability of the current asset portfolio

Fleet Reliability (net)	-0.0%	Neutral effect balancing the introduction of new rolling stock with increasing fleet reliability problems
Project Works (net)	-0.0%	There is a neutral effect driven by the
Passenger Growth	-0.1%	Caused by higher reactionary delays from lost right time resilience
TOC Operations	-0.4%	This is the total impact of factors including IR issues, and the effect of big events

The trajectory of the performance throughout the control period starts flat to reflect the impact of the introduction of the new fleets but then shows steady improvement of 0.4% per annum on average.

TransPennine Express

Reaching agreement between the route and the TOC is furthest away in the case of TPE. This is because of the consistent variation between the TOC targets and the forecast trajectory of at least 2.5%. This makes it highly unlikely that the TOC will agree those plans.

The trajectory put forward by the route assumes a modest improvement of 0.4% at a steady rate over CP6. The principle factors are:

Factor	Impact	Comment
Network Rail Operations	+0.3%	This is derived from a combination of benefits from better systems and data, a focus on right time performance, and better route alignment with TOC objectives
Optimised timetable	+0.3%	From better timetable modelling and a joint approach to planning
External	+0.3%	Delivered through a 'whole industry' approach to the autumn dip, route crime and weather resilience
TOC Assets (net)	+0.3%	Balancing positive effect of the introduction of the new fleet and the impact of other TOC fleet unreliability
Network Rail Assets (net)	+0.0%	Benefits from the initiative to predict and prevent faults through better maintenance are completely negated by the on-going unreliability of the current asset portfolio
TOC Operations	-0.1%	Considered to be generated by an increased number of incidents and greater delays from each
Project Works (net)	-0.2%	Higher volume of work creating more risk in delivery and overruns
Passenger Growth	-0.4%	Caused by higher reactionary delays from lost right time resilience

Virgin West Coast

The submission provided good evidence of collaborative working between the route and VWC. This is evidenced through the performance meeting structure and the seniority of those engaged in the process.

Performance of this TOC (and West Midland Trains) will be dominated by the impacts of HS2 construction. Along with this the principle factors are:

Factor	Impact	Comment
Network Rail Operations	+0.15%	This is derived from a combination of benefits from better systems and data, a focus on right time performance, and better route alignment with TOC objectives
Optimised timetable	+0.1%	From better timetable modelling and a joint approach to planning
External	+0.15%	Delivered through a 'whole industry' approach to route crime and weather resilience
TOC Assets (net)	+0.0%	Balanced view of the impact of fleet reliability
Network Rail Assets (net)	-0.1%	Benefits from the initiative to predict and prevent faults through better maintenance are completely negated by the on-going unreliability of the current asset portfolio
TOC Operations	-0.15%	Worsenment from increased number of incidents and the removal of the Public Book differentials
Project Works (net)	-0.9%	Dominated by the impact of HS2 construction and other Network Rail project works. Small positive impact from enhancement delivery
Passenger Growth	-0.1%	Caused by higher reactionary delays from lost right time resilience

The trajectory by year of the performance level is largely neutral up to the end of the second year, declines for two years (Birmingham resignalling) and then flat-lines for the last year. It is

It is noted that there has been a long-held target of 88% for the performance on VWC. The current trajectory is lower than this. As a result, the route has worked with the TOC to identify some early initiatives covering:

30. Relatively simple / quick wins;

31. More complex / likely to require additional funding; and

32. Blue sky / industry changing / requiring significant funding.

The collaborative working between the route and the TOC on these initiatives has resulted in an 'alternative trajectory'. The documentation provides a good summary of the initiatives that have been identified in this process with the TOC and the quantification of each element of this. The impact of this alternative is to deliver a +1.0% over the course of CP6.

West Midland Trains

As with the other TOCs there is good evidence of engagement with the TOC. They have established a Performance Board to lead the governance of performance delivery.

The trajectory that has been put forward by the route is adrift from the TOC targets by roundly 1.6% on average throughout the five years. The CP6 exit figure is 1.6% worse for the trajectory against the TOC target.

In terms of the shape of the profile it is highly volatile driven by the impacts of HS2 work and the performance risk associated with the planned Birmingham resignalling works in 2021/22.

The key elements of the performance trajectory and shown below:

Factor	Impact	Comment
Network Rail Operations	+0.3%	This is derived from a combination of benefits from better systems and data, a focus on right time performance, and better route alignment with TOC objectives
Optimised timetable	+0.25%	From better timetable modelling and a joint approach to planning
External	+0.25%	Delivered through a 'whole industry' approach to autumn dip, route crime and weather resilience
TOC Assets (net)	+0.05%	Balanced view of the impact of fleet reliability
Network Rail Assets (net)	+0.05%	Benefits from the initiative to predict and prevent faults through better maintenance are completely negated by the on-going unreliability of the current asset portfolio
Passenger Growth	-0.1%	Caused by higher reactionary delays from lost right time resilience
TOC Operations	-0.15%	Worsenment from increased number of incidents and IR issues
Project Works (net)	-0.4%	Dominated by the impact of HS2 construction and other NR project works. Small positive impact from enhancement delivery

Arup View

There is strong evidence that the route has put a considerable effort into working collaboratively with the TOCs to develop performance plans. These are grounded in a structure approach taking account of the risks and opportunities that are applicable in the case of each of the TOCs. This has then been quantified based on historic performance trends to create the trajectories that have been presented in the submission. It is noted in several cases that there is ongoing work taking place with the TOCs to further refine the outputs.

There is clearly a gap between the trajectories being produced through this process and the targets set for the TOCs and as such it is not surprising that the TOCs have been unable to sign-off on the outputs. It is noted that Merseyrail has been able to agree to the trajectory.

The further work done by the route and VWC in reflection of the recent dip in performance and their initiatives that could recover the situation is reflective of the concern over current outputs. The status of the resulting 'alternative trajectory' is not clear but it is assumed that this will be reflected in the late August submission from the route.

The good work which had been undertaken by the route was not reflected in the meeting held with them as part of this process.

It is noted that the dominant impact in the trajectories for the two TOCs based out of Euston is the impact of HS2. It has not been made clear how these levels of impact have been quantified given the one-off nature of the construction activity other than to note that generally historical experience has been utilised.

Conclusion

Based on the foregoing analysis we have a high level of confidence in the trajectories produced by the route within CP6 strengthened by the sign off by one (albeit it the smallest) TOC.

H3.6.3 Performance Model

Engagement Findings

No changes have been made to the model since the submission of the SBP. Full sign-off of the CP5 exit and CP6 trajectories has been achieved only with Merseyrail, although VWC have agreed to the SBP CP5 exit figure. A request for information summarising the difference of opinions between LNW and the TOCs has been requested, but not yet been received.

LNW adopted a bottom up approach to the modelling which was heavily reliant on consultation with their five lead TOCs. The forecasting approach was based on an iterative process focussed upon data, knowledge, experience and judgement. Review of existing data has allowed current and recent performance trends to be used to inform risks and opportunities for CP6. The route forecast has then been considered against the TOC aspirations.

Arup View

The approach adopted remains inconclusive with four of the five TOCs with gaps remaining in predicted performance. A sense of difficulty was clearly communicated in relation to the availability of information for planned CP6 interventions by the TOCs. Examples of unknowns include uncertainty associated with early stage planning of the West Coast Partnership or the recent WMT franchise change. The qualitative, highly iterative approach to forecasting performance may have worked against the route as a more quantitative approach may have provided better evidence to support route projections during consultation with stakeholders.

Conclusion

Low confidence based on the continuing difficulties to close gaps across a range of different initiatives.

H3.6.4 Sustainability

Engagement Findings

The route stated that their focus for the identification of the schemes to benefit from the extra Investment was focused on an improvement in sustainability. They conceded that there would potentially be some performance benefit from the

investment but this has not been evaluated. The uncertain nature of the additional investment meant that it had not been seriously considered as a performance enhancement initiative. This view aligns with the routes sustainability submission which provided a qualitative assessment of performance benefits most of which were marginal.

Arup View

With a significant share of the investment going to LNW it is disappointing to note that no performance benefits had been assumed. However, this approach is in line with that of the other routes which do not appear to consider the investment or their share of the investment confirmed.

Conclusion

It is not possible to come to a view on the sustainability submission since it has not featured in the performance outputs.

H3.7 Wales

H3.7.1 CP5 Exit

Engagement Findings

The current PPM MAA for the single Wales route TOC is 92.5%. The route has assessed that the PPM figure for the end of CP5 will be 91.8%. This has been assessed through the consideration of around twelve factors. The most significant benefit comes from improvements in the Command and Control organisational changes (+0.19%). Negative impacts are derived from:

33. Severe Weather risk (-0.30%);
34. Fleet availability (-0.21%);
35. Fleet Reliability (-0.20%);
36. Autumn Delivery (-0.16%); and
37. Cable Theft (-01.13%).

The assessment of the impact of these negative risks was said to have been based on recent trends in each category.

The route stated that it had "high confidence" in its ability to deliver 91.8% or higher at CP5 exit citing 17/18 close out at 92.4% and a three-year running average of 92.2%. The route ran a short-term forecasting model to inform the confidence levels of forecasting year end performance.

It is noted that the timetable change challenges in May 2018 had relatively little impact on train services in Wales.

In terms of engagement with the new operators of the Wales and Border franchise there was strong evidence that the route had met with the team on several occasions and that this was to continue. It was noted that the route had not been

party to the operational performance plans of the bidders during the process and as such had only recently been made aware of the forecast levels of delivery contracted by Transport for Wales. Up to that point the route had assumed a neutral effect of the new franchise. (It is now understood that this approach had been previously agreed with the ORR.)

Arup View

It was surprising that the route had not been associated with the development of the performance plans of the new franchise bidders and therefore their assumption of neutrality was understandable if somewhat optimistic. There is good evidence that the route has undertaken a thorough review of its current position and used experience to forecast to the exit of CP5. The contents of the make-up of the path from current performance to the end of 18/19 appear comprehensive and well founded.

Conclusion

Based on the available information was have confidence in the route's ability to achieve the forecast CP5 exit level of performance.

H3.7.2 CP6 Trajectory

Engagement Findings

There are significant changes taking place to the train services in Wales over the course of CP6. The new operator plans the early introduction of new rolling stock to replace the entire fleet which is likely to be of innovative design. The Valley Lines will be removed from Network Rail control and passed to the franchise holder. There will be a new bespoke train performance regime introduced and the frequency of services on the Valley Lines and other routes in Wales will increase.

All the foregoing makes the forecasting of performance on the route a challenge.

Across CP6 the route has forecast that performance for the franchise will improve from 91.8% to 92.1%. This assessment has been undertaken based on a bottom-up assessment of the factors considered to influence performance.

Against this background of volatility, the route has identified five significant factors that will dictate the CP6 performance trajectory. The following table summarises these;

Factor	Impact	Comment
RAM Plans	+0.14%	This is the net effect of several cross-discipline initiatives with benefits coming from signalling and off-track works and some worsenments in structures and E&P
Operations Strategy	+0.09%	Driven by benefits from TMS, SIO organisation and operational effectiveness
TOC Improvements	+0.22% net	The introduction of the new rolling stock is considered to bring significant benefit however the route has tempered that improvement with an overlay effectively halving the performance improvement

Traffic Growth	-0.10%	
Passenger Growth	0.05%	

Arup View

There is lot going on in the route and this leads to a high degree of uncertainty about future performance levels. The route has adopted a structured and logical approach which may be appropriate for a steady state railway but may miss the mark in terms of what is required here. There is an acknowledgement of the uncertainty surrounding the new franchise and some attempt has been made to dampen down the benefits from the new rolling stock. However, this may not go far enough given the innovative nature of the new rolling stock and the challenging delivery times the TOC has planned. Equally there was little evidence that the bedding-in time for the new rolling stock had been considered.

As a further risk there was no evidence that the impact of the electrification of the GW mainline and the cross-border impacts this could have had been included in the plans. Their approach appeared passive and as if the route modernisation was happening around them.

It was stated at the meeting by the route that there was lots of risk but equally lots of opportunity with the new infrastructure that is planned. In principle we agree with this assertion however there was no evidence that the likely disruption which new infrastructure would inevitably bring had been considered in the plans.

It was noticeable that the route wouldn't be drawn on confidence in the meeting. They wouldn't even give an estimate of expected performance nor their expected confidence in reaching it.

Conclusion

Based on the foregoing we have low confidence that the CP6 trajectory will be achieved. It is noted however that this is a particularly volatile set of circumstances in the route and it would be difficult to generate high levels of confidence given that environment.

H3.7.3 Performance Model

Engagement Findings

Wales is the lead TOC for Arriva Trains Wales (ATW) and the new franchise was awarded in Jun 2018 to Keolis Amey (KATW). Wales route have worked closely with Transport for Wales (TfW) to gain a comprehensive understanding of the new franchise.

The CP6 performance model is based on a bottom up method that quantifies each initiative in turn, using statistical forecasting method to inform target setting. Wales Route are happy with the baseline however, improvement plans developed by the franchise bidders had not been shared. As a result, Wales Route are revisiting their CP6 trajectories via a change control process with ORR, to understand the change in performance opportunities and risks associated with the new challenge.

Arup View

The bottom up approach to the modelling provides the CP5 exit and entrance points but will need to be revised to reflect the new franchise. At the time of our meeting, Wales had not yet seen outputs from the KATW bid model. Consequently, the key challenge facing the Wales Route will be understanding the performance impact of KATW, in particular how performance impacts will be spread through CP6. The Route will need to critically consider phasing of the KATW initiatives to establish realistic benefits and opportunities for the revised trajectory.

Conclusion

Wales Route have taken account of our previous model review, and we have high confidence in the baseline assessment acknowledging that TOC initiatives will be changed moving forward.

H3.7.4 Sustainability

Engagement Findings

The route stated in the meeting that they had not included any impacts of the additional sustainability investment in their trajectory assessment. This was because the investment had not yet been confirmed. However, it was stated by the route that once confirmed it was likely that the benefits to performance would be limited given that the delivery of the schemes would take place towards the end of the control period.

Arup View

The route's view was very much that if the investment was confirmed the focus of the extra investment was on asset sustainability. Given their view of the programming of delivery amongst the other works taking place we agree that the benefits in performance terms were likely to be lost in the tide of other infrastructure works taking place associated with the new train services.

Conclusion

It is not possible to come to a view on the sustainability submission since it has not featured in the performance outputs.